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Person-centered rehabilitation care and outcomes: A systematic literature review

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ABSTRACT

Background: Despite growing recognition of person-centered care as an essential component of quality care, little is known about how person-centered care can be implemented in the provision of care services and how it is empirically related to outcomes in the rehabilitation settings.
Objectives: To investigate the extent of implementation of the person-centered care in rehabilitation practices, as well as its effects on relevant outcomes.
Design: Systematic literature review.
Data sources: Six electronic databases (PubMed, Web of Science, CINAHL, Scopus, PsycARTICLES, and Cochrane library) were searched for articles published between January 2000 and January 2018.
Methods: Based on the inclusion criteria, quantitative studies that examined person-centered rehabilitation interventions and relevant outcomes were included. Study quality assessment, data extraction, and synthesis were performed.
Results: For this systematic review, 17 eligible studies were included and most studies were rated as low-quality. The selected studies were varied concerning the use of the term person-centered care, research design, target population, sample size, setting, intervention, and outcome measures. The most examined interventions in this review were focused on goal setting and shared-decision making processes based on the client-centered approach. The implementation of those interventions varied considerably. Results showed mixed relationships between person-centered care and the outcomes examined in the studies although there was strong evidence regarding the positive effects of person-centered care on occupational performance and rehabilitation satisfaction.
Conclusions: Person-centered care has been increasingly advocated in rehabilitation settings. However, we found that true person-centered care was not fully implemented in rehabilitation practices. Moreover, it appears that person-centered care could positively affect rehabilitation outcomes, such as significant improvements in functional performance and quality of life, however, evidence about these positive effects of person-centered care is not sufficient. More research with rigorous designs is needed.

What is already known about the topic?

- Person-centered care has been widely advocated for enhancing care quality in health care settings.
- Despite recent efforts to establish a consensus definition of person-centered care, there is no standardized and agreed-upon definition across health care settings, and the term “person-centered” has been used interchangeably with “patient-centered” and “client-centered” in the literature.
- There is weak evidence for the relationships between person-centered care and relevant outcomes.

What this paper adds

- A variety of person-centered rehabilitation services were developed focusing on goal setting and shared decision-making processes, but the core attributes of person-centered care, especially the holistic approach, were not fully reflected in those rehabilitation services.
- The positive effects of person-centered care on some rehabilitation outcomes such as physical ability and quality of life were inconclusive.

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- More scientifically rigorous research is needed to develop evidence-based practice guidelines for person-centered care in rehabilitation settings.

1. Background

In recent years, person-centered care has been recognized as a promising avenue to improve care quality in health care systems (Brownie and Nancarrow, 2013; Wolf et al., 2008). Conceptually, person-centered care has its foundation within a holistic paradigm that requires shifting the focus from services offered by the care provider to treat the disease to services that concern the whole person, including biological, psychosocial, and spiritual aspects, values, preferences, experiences, and the right to make decisions about one's own treatment (McCormack, 2003; Morgan and Yoder, 2012). To translate person-centered care into practice, the concept has been defined in various ways (Institute of Medicine, 2001; Morgan and Yoder, 2012; Zhao et al., 2016). An agreed-upon definition of person-centered care for older adults with chronic conditions and functional impairment was recently established by the American Geriatrics Society Expert Panel (2016) based on research evidence about person-centered care (Kogan et al., 2016). Yet, there has been no consensus about the definition and attributes of person-centered care applied in various health care settings (Cheng et al., 2016). Furthermore, the term "person" in person-centered care often has been used interchangeably with "patient," "client," and "resident," although nuances between the terms have been addressed (Kogan et al., 2016; Zhao et al., 2016). For example, "person" and "patient" literally differ in terms of the recipient of care; person-centered care is likely to involve not only personal and social service needs but also a much broader context of the human being, whereas patient-centered care tends to focus primarily on individuals with a certain disease and the disease treatment process (Zhao et al., 2016).

Despite the lack of agreement about the definition of person-centered care, as well as variations in the use of the term, a growing number of researchers have demonstrated that person-centered care practices are significantly and positively associated with care quality and health outcomes, such as better functional ability and well-being, higher satisfaction with care, better quality of life, and lower care costs (Larsson et al., 2014; Morgan and Yoder, 2012; Olsson et al., 2013). Considering person-centered care as an essential component for improving care quality, much attention has been given to implementing person-centered care practices in various health care settings. In particular, person-centered care has been widely endorsed to provide better care for people with dementia and cognitive impairments in long-term care settings (Edvardsson and Innes, 2010; McCormack, 2004; Brownie and Nancarrow, 2013). Recently, some efforts for redesigning health care services to implement person-centered care practices have been made in rehabilitation settings (Jesus et al., 2016; Kogan et al., 2016).

In clinical practice, rehabilitation is a multidisciplinary care process that helps individuals with health conditions experiencing or likely to experience disability, such as stroke, chronic low back pain, or cervical-spinal cord injury, regain and maintain their optimal functioning in interaction with their environment (Kamper et al., 2015; Meyer et al., 2011; Winstein et al., 2016). The ultimate goal of such rehabilitation care services is to bring individuals with disabilities back to their optimal level of functioning, which could involve a long, reiterative, and demanding process (Ekstam et al., 2007; Rosewilliam et al., 2011). Even after rehabilitation, however, no significant improvements in several outcomes have been reported, including independence in activities of daily living, mobility, participation, and life satisfaction (Egan et al., 2007; Eyssen et al., 2013; Guidetti et al., 2015). For example, in the occurrence of stroke, a significant contributor to disability, many stroke survivors have reported that they still had great difficulty or were somewhat dependent in activities of daily living after rehabilitation usually for three to four months (Egan et al., 2007; Winstein et al., 2016). Moreover, living with a long-term disability has been associated not only with physical function limitations but also with emotional, psychosocial, and social problems, which, in turn, is likely to influence the whole life situation and decrease life satisfaction (Mangset et al., 2008; Post and van Leeuwen, 2012; Salter et al., 2010). Thus, there is a need to develop effective rehabilitation care services that could result in better outcomes.

Goal setting has been demonstrated to be one of the key components of rehabilitation (Rosewilliam et al., 2011). To successfully achieve the best results in rehabilitation, individuals with a disability should be actively engaged in the goal-setting process as partners, and their goals and rehabilitation care activities should be tailored to their perceived needs (Bertilsson et al., 2014; Eyssen et al., 2013; Flink et al., 2016). This fundamental concept in rehabilitation practice is similar to the core attributes of person-centered care, including individual autonomy and choice, respect for diversity, and interpersonal relationships (Morgan and Yoder, 2012). Considering each individual's lived experiences, situations, expectations, and varying levels of disability, it would be a great challenge for health care professionals to translate the person-centered care concept into practice. Although many health care professionals have recognized person-centered care to be an essential part of rehabilitation care, they still have difficulties shifting their focus from the disease to the whole person (Olsson et al., 2013).

Several conceptual models have been used as a guideline for person-centered practice in the rehabilitation process. The Canadian Model of Occupational Performance—later expanded to the Canadian Model of Occupational Performance and Engagement (Polatajko et al., 2007)—was one of the most frequently used models that were developed to facilitate individuals' occupational participation considering the person–environment interaction (Canadian Association of Occupational Therapists [CAOT], 1997, 2002; Law et al., 1996; Wong and Fisher, 2015). In addition, the Canadian Occupational Performance Measure was developed as an outcome measure for use with the model (Law et al., 1998). The core components of this occupation-focused model are the person, environment, and occupation, and a dynamic relationship among those components is illustrated in the model (CAOT, 1997, 2002). The model has served as a basic principle of client-centered practice, which emphasizes a collaborative partnership between the therapist and the client throughout the occupational therapy process (Wong and Fisher, 2015). Perhaps consequently, person-centered rehabilitation interventions developed to date—mostly referred to as client-centered—have been primarily focused on building partnerships and shared decision-making processes to set goals with patients/clients with a disability (Flink et al., 2016; Rosewilliam et al., 2011). These interventions might not be fully reflective of the person-centered care that has a wider perspective on the person beyond the patient.

On the other hand, many researchers have been working constantly to develop authentic person-centered practice in health care settings. For example, the University of Gothenburg Centre for Person-centered Care, an interdisciplinary research center for the study of person-centered care, was established with the support of the Swedish government (University of Gothenburg, n.d.). In a Gothenburg person-centered approach, the importance of knowing the patient as a person is highly emphasized. Taking the time to listen to patients' narratives is a key component of Gothenburg person-centered care, which is implemented as a daily routine in

clinical practice (Ekman et al., 2011; Fors et al., 2017). Recently, researchers began to review studies about person/patient-centered rehabilitation care (Cheng et al., 2016; Jesus et al., 2016), indicating that more studies are needed to provide evidence for a better understanding of the nature of person-centered care and its actual adoption into rehabilitation practice to develop effective person-centered care specifically for this setting.

Therefore, the specific aims of this review were (1) to explore the current status of research about person-centered care for rehabilitation interventions, (2) to examine how person-centered care has been implemented in rehabilitation practice and empirically associated with outcomes, and (3) to investigate what attributes of the person-centered care concept were implemented specifically for rehabilitation practice. In this review, person-centered care refers to a holistic approach to provide respectful and individualized care based on a therapeutic relationship between all care providers and individuals who are empowered to be involved in their health care decisions (Morgan and Yoder, 2012). This definition was derived from a concept analysis of person-centered care in the context of an inpatient post-acute care setting that provides an inpatient rehabilitation program after an acute hospitalization. Moreover, this definition was considered to reflect the essence of the philosophical foundation about the person-centered care concept along with four core attributes identified in the concept analysis: holistic, individual, respectful, and empowering (Morgan and Yoder, 2012).

2. Methods

2.1. Search strategy

Extensive searches were conducted in several databases, including PubMed, Web of Science, CINAHL, Scopus, PsycARTICLES, and Cochrane library, from January 2000 since the development of guidelines for client-centered rehabilitation practice in the late 1990s (Carswell et al., 2004) until January 2018. The preliminary search began in PubMed with major keywords listed on the Medline Medical Subject Headings (MeSH) terms, such as "person-centered" and "rehabilitation." With regard to the term "person-centered," other various terms that reflect person-centered care were used in the literature, including "patient-centered" and "client-centered." Thus, we also considered those terms in the search. As relevant articles were retrieved, their abstracts with keywords and MeSH terms were screened, and any new terms were added to the search, such as "patient centered" and "individualized care." The final search terms were set as follows: [(person-cent*) OR (person cent*) OR (patient-cent*) OR (patient cent*) OR (client-cent*) OR (client cent*) OR (individualized care) OR (person focused care)] AND [rehabilitation OR (physical therap*) OR (occupational therap*)]. These main search terms were used to search articles in the remaining databases. Additionally, the reference lists of the articles retrieved were manually searched for additional relevant articles.

2.2. Eligibility criteria and study selection

Duplicate articles were excluded and retrieved articles were screened based on the title, keywords, and abstract. All articles were reviewed by one author and then verified by another author who was a subject expert. For this review, the articles that met the following criteria were selected: (1) studies with individuals aged 18 years of age or older; (2) studies written in English, peer-reviewed, and available full-text; (3) quantitative studies about rehabilitation intervention in any care location, such as acute care and community settings; (4) studies about any rehabilitation intervention developed based on the person-centered care concept; and (5) studies about any outcomes related to person-centered rehabilitation interventions, excluding studies that evaluated only staff outcomes, such as staff education and staff satisfaction.

2.3. Quality assessment

Quality assessment was performed independently by two authors, and then a consensus was reached concerning all quality ratings through discussions about discrepancies. To assess the quality of evidence from studies selected for this review, we used the Johns Hopkins Nursing Evidence-Based Practice Research Evidence Appraisal Tool (Dang and Dearholt, 2017). This tool comprises 15 questions to evaluate research quality, including study design, sample size, data collection, response rate, measurement validity, results, and conclusion. Each question was answered by checking "Yes," "No," or "Not Applicable." Once all questions were answered, study quality was evaluated based on each of the questions with a "Yes" response. Overall study quality was considered to be high (A), good (B), or low with major flaws (C). High quality refers to adequate control, sufficient sample size for the study design, consistent, generalizable results, definitive conclusions, and consistent recommendations based on a comprehensive literature review including thorough reference to scientific evidence. Good quality refers to some control, sufficient sample size for the study design, reasonably consistent results, fairly definitive conclusions, and reasonably consistent recommendations based on a fairly comprehensive literature review including some reference to scientific evidence. Low quality refers to insufficient sample size for the study design, little evidence with inconsistent results, and conclusions not drawn (Dang and Dearholt, 2017).

2.4. Data extraction

Comprehensive data extractions were conducted. Initially, we collected data regarding general study characteristics, including author information, publication year, country of origin, study design, setting, target sample, sample size, outcome measures, and results. In addition, we collected data specific to person-centered rehabilitation interventions in selected studies, such as conceptual frameworks applied to translate person-centered care into actual practices and detailed procedures. Data about specific intervention contents were coded based on four core attributes of person-centered care identified by Morgan and Yoder (2012)—holistic, individualized, respectful, and empowering—to investigate what attributes of the person-centered care concept were implemented in the interventions from each of these studies that were selected for this review. Describing the attributes more specifically, holistic care considers all aspects of the whole person, including biological, psychosocial, social, and spiritual needs. Individualized care consists of the most frequently recognized attributes of person-centered care, which considers the personal life situations, unique needs, and preferences of the person receiving customized care. Being respectful is involved in allowing individuals to make decisions about their own treatments and to have choices regarding services and care. Finally, empowerment is an important attribute to facilitate the person's participation in the decision-making process, which is related to autonomy, informed knowledge, and effective communication.

3. Results

3.1. Study selection

A total of 5442 articles were found using all search strategies, including electronic database searches and secondary searches.

After removal of 146 duplicates, the titles and abstracts of 5296 articles were screened based on the inclusion criteria and 43 articles were available for full-text screening. Of these, 26 articles that did not meet the inclusion criteria were additionally excluded. For example, excluded studies were not experimental studies (n = 9) or were not specific to person/patient-centered care (n = 11). In addition, several authors had multiple published articles from a single study with the same interventions, so we deleted those articles (n = 4), counting the study only once in our review. Therefore, 17 eligible articles were included in the final literature review (Fig. 1).

3.2. Characteristics of the studies

The general characteristics of the studies included in the current review are presented in Table 1. The final 17 studies were all quantitative studies and employed various research designs, including randomized controlled trial (n = 10), controlled quasi-experimental (n = 5), and experimental with no control group (n = 2). Of those studies published between 2002 and 2017, 11 studies were conducted within the last five years before 2017 when the last study in this review was published, and 13 studies were conducted in Europe (7 in Sweden, 2 in the United Kingdom, 2 in the Netherlands, 1 in Belgium, and 1 in Germany), 2 in Canada, 1 in the United States, and 1 in Australia, indicating that person-centered rehabilitation practices were investigated more in Europe than in other places.

The target populations, sample sizes, and settings were varied. In half of the studies (n = 8), the target samples were people with stroke while the conditions in the remaining studies included heart diseases (n = 3), such as chronic heart failure, and musculoskeletal disorders (n = 5), such as multiple sclerosis, rheumatoid arthritis, and spinal cord injury. The total sample sizes of most studies were moderate, ranging from 118 to 475 participants, although one study had a large sample of 1,042, and five studies had relatively small sample sizes, ranging from 14 to 70 participants. In addition, 10 studies were conducted in inpatient care settings, four were in outpatient care settings, and three were in community settings.

With regard to the conceptual framework to develop interventions in these studies, only three of the 17 interventions were developed based on the person-centered care concept, such as Gothenburg person-centered care. Eight interventions were developed based on a client-centered approach, seven of which employed the Canadian model of occupational performance that provides guidelines for client-centered occupational therapy (Bertilsson et al., 2014; Egan et al., 2007). Moreover, interventions were developed with various procedures and delivered at different periods over an average of three months, ranging from one to five months. Although some interventions (n = 5) were provided by a multidisciplinary team of health professionals, including a physician, nurse, occupational therapist, and physiotherapist, most were provided primarily by occupational therapists. Two interventions, person-centered care for hip replacement (Olsson et al., 2016) and an individualized stroke coaching program (Vanacker et al., 2017), were designed for a specialized nurse to play an important role in the provision of the intervention.

Regarding the results of the quality ratings of the 17 studies, four were high quality (A), and four were good quality (B), while the remaining nine were low quality (C). Among the 15 items used to evaluate the quality of the studies, the items most frequently marked with “No,” or “Not Applicable” were in studies with low quality having insufficient sample size, lack of demographic similarity between the intervention and control groups, and lack of information about reliability and validity of instruments.

3.3. Person-centered rehabilitation interventions

Table 2 presents the specific details of the implementation of person-centered rehabilitation interventions in the studies where the conceptual attributes of person-centered care could be identified. We found 10 different person-centered rehabilitation interventions in this review. Regarding interventions that embraced the person-centered care concept, various terms, such as “client-centered,” “patient-centered,” “person-centered,” “goal setting,” and “individualized,” were used. The term “client-centered” (n = 6) was used more commonly than other terms, whereas the term “person-centered” was used in only three studies.

Although the specific processes for each of the interventions varied considerably, most interventions except for self-management education and individualized coaching programs primarily focused on setting individual goals based on a shared decision-making process in which health care professionals and patients were involved in establishing a collaborative partnership during the first step of the intervention. For interventions to be successfully implemented, a systematic approach was used. For example, client-centered rehabilitation interventions using the Canadian Occupational Performance Measure described in six studies were implemented by establishing a collaborative

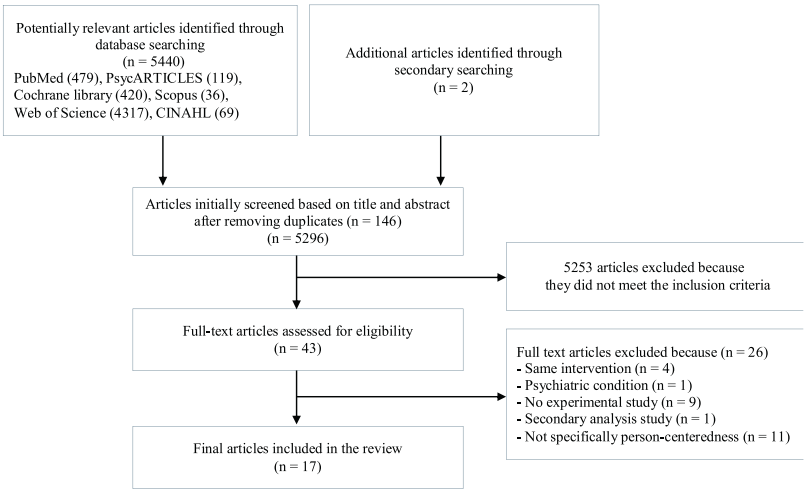

Fig. 1. Flowchart of Literature Searching.

Table 1
Characteristics of Studies Included in the Review.

No	Author (Year) Country	Design	Setting	Sample	Sample size total N (IG/CG)	Intervention	Framework	Quality Rating
1	Wressle et al. (2002) Sweden	Experimental study	2 hospitals	Stroke patients receiving inpatient rehabilitation	118 (88/30)	C: Usual care I: Client-centered occupational therapy and physiotherapy during in-patient period by physical therapist, occupational therapists (OTs)	Client-centered approach CMOP	C
2	Egan et al. (2007) Canada	Pilot RCT	Community setting	Stroke survivors > 6 months post discharge	14 (6/8)	C: Usual care I: Client-centered occupational therapy 8 visits from a registered OT over 2-4 months	Client-centeredapproach CMOP	C
3	Holliday et al. (2007) UK	Experimental study (Optimized balance block design controlled study)	1 neurological rehabilitation unit, London	Patients with stroke, multiple sclerosis, or non-traumatic spinal cord lesions	201 (101/100)	C: Usual practice goal setting I: Increased participation goal setting using a goal setting work book and the presence of the patient in the goal setting meetings, multidisciplinary team approach during in-patient period	NA	C
4	Redfern et al. (2008) Australia	single-blind RCT	1 tertiary referral hospital, Sydney	Acute Coronary syndrome survivors	208 (64/72/72)	R: Reference group with cardiac rehabilitation C: Conventional care I: Patient-centered modular intervention (1-hour initial consultation & approximately four 10- minute follow-up phone calls) with family physicians & cardiologists over 3 months	Individualized, case management approach	C
5	Guidetti et al. (2010) Sweden	Pilot RCT	3 rehabilitation clinics, Stockholm	Stroke patients	40 (19/21)	C: Usual self-care training I: Client-centered, self-care intervention by OTs (9 steps, 3 months)	Client-centered, self-care approach	B
6	Spooren et al. (2011) Netherlands	Clinical intervention study	Adelante rehabilitation center	Patients with cervical spinal cord injury and arm hand skilled performance problems	22 (11/11)	C: Usual care I: Task-oriented client-centered upper extremity skilled performance training(ToCUEST) during rehabilitation by a team of specialized physiothe- rapists & OTs (3 sessions of 30 min per day, 8 weeks)	Client-centered approach CMOP	C
7	Eyssen et al. (2013) Netherlands	Multicentre, cluster RCT	13 outpatient clinics of hospitals and rehabilitation centers	Patients with multiple sclerosis	269 (156/113)	C: Usual care I: Client centered practice by OTs received a two- day course in client-centered practice	Client-centered process model	A
8	McGilton et al. (2013) Canada	Quasi-experimental design	2 community hospital inpatient rehabilitation units	Older patients ≥ 65 with a hip fracture, including those with cognitive impairment	149 (76/73)	C: Usual care (5 weeks) I: Patient-centered rehabilitation model including persons with cognitive Impairment (PCRM-CI) intervention during in-patient period by unit staff	Patient-centered approach	B
9	Bertilsson et al. (2014) Sweden	Multicentre, cluster RCT	16 rehabilitation units, Stockholm, Uppsala & Gävleborg Counties	Stroke patients in an acute stroke unit ≤ 3 months receiving inpatient rehabilitation or home-based rehabilitation their significant others	Stroke patients 280 (129/151) Significant others (87/93)	C: Usual ADL intervention I: Client-centered ADL intervention (CADL) by trained occupation therapist (9 steps, 5 session, 1-3 months)	Client-centered approach CMOP	C
10	Guidetti et al. (2015) Sweden	Multicentre, cluster RCT	16 rehabilitation units, Stockholm, Uppsala & Gävleborg Counties	Stroke patients in an acute stroke unit ≤ 3 months receiving in-patient rehabilitation or home-based rehabilitation	280 (129/151)	C: Usual ADL intervention I: Client-centered ADL intervention (CADL) by trained occupation therapist (9 steps, 5 session, 1-3 months)	Client-centered approach	C
11	Sackley et al. (2015) UK	cluster RCT	228 care homes (>10 beds each) across UK	Residents with a history of stroke or transient ischemic attack	1042 (568/474)	C: Usual care I: Customized occupational therapy intervention (a workshop for care home staff, involving patient centered goal setting, education of care home staff, & adaptations to the environment) by qualified OTs during 3 months	Client-centered approach	A
12	Feldthusen et al. (2016) Sweden	single-blind RCT	Hospital outpatient Rheumatoid Clinics	Persons with rheumatoid arthritis	70 (36/34)	C: Usual care I: Person-centered physical therapy by physical therapists (average 4 sessions, 30 min, 12 weeks)	Person-centered approach	A
13	Meng et al. (2016) Germany	Multicentre, cluster RCT	4 cardiac rehabilitation clinics	Chronic systolic heart failure patients	475 (248/227)	C: Usual care (a 60-min lecture-based education program) I: Self-management educational group program (5 patient-centered, interactive sessions, 60 or 75 min each) in small groups of a closed format led by interdisciplinary team (physician, nurse, psychologist, & physiotherapist) during in-patient period	NA	A
14			2 designated Swedish orthopedic departments	Patients scheduled for total hip arthroplasty	266 (128/138)	C: Standard care I: Gothenburg person-centered care (gPCC) by registered nurses & physiotherapists		B

	Olsson et al. (2016) Sweden	Quasi-experimental design	(1 in a county hospital & 1 in a university hospital)					Gothenburg person-centered care	
15	Fors et al. (2017) Sweden	RCT	2 Hospital out-patient cardiac clinics and public primary care centers	patients with acute coronary syndrome	199 (94/105)	C: Usual care I: Person-centered care in daily clinical practice by PCC teams		Gothenburg person-centered care	B
16	Vanacker et al. (2017) Belgium	Interventional study	1 primary stroke center, Saint-Lucas hospital	Patients with acute ischemic stroke	152	No control group I: Individualized stroke coaching program by a stroke coach (a well-trained & experienced stroke nurse) during hospitalization (twice, 20 min) & post-discharge (phone calls at 1,3,6 & 12 months)		NA	C
17	Waldersen et al. (2017) USA	Experimental study	Community setting (participant's homes), Baltimore, MD	Older adults ≥ 65 with disability	226	No control group I: home-based, person-directed, structured program by an interprofessional team (OTs, RNs, & handyman) during 5 months		Community Aging in Place, Advancing Better Living for Elders (CAPABLE) model	C

Note. RCT = randomized controlled trial, C = control group, I = intervention group, R = reference group, OTs = occupational therapists, RNs = registered nurses, CMOP = Canadian Model of Occupational Performance, NA = not available, ADL = activity of daily living.
Regarding quality rating, A = high quality, B = good quality, C = poor quality or major flaws.

partnership between the therapist and the client, identifying individual performance issues, and engaging clients in setting goals that were personally relevant (Bertilsson et al., 2014; Egan et al., 2007; Guidetti et al., 2010, 2015; Spooren et al., 2011; Wressle et al., 2002). Furthermore, various additional strategies were implemented, including the use of workbooks, systematic risk assessment, self-commitment to a written action plan, provision of resource packages or leaflets, and open communication.

In one of the two interventions that directly labeled the term "person-centered," the process of Gothenburg person-centered care (Fors et al., 2017; Olsson et al., 2016) focused more on the whole person by obtaining a narrative from each individual during the first step, covering personal life situations, resources, context, motivation, and environmental needs, compared to other interventions that were not labeled as "person-centered" but applied some attributes of person-centered care to facilitate the client/patient-centered decision-making process. Each of the 10 interventions was examined concerning which attributes of the person-centered care concept were explicitly translated into practice according to the core attributes of this concept identified by Morgan and Yoder (2012): holistic, individualized, respectful, and empowering. The most-prominent attribute found in this review was individualized care because this attribute was identified in all 10 interventions. Although three out of four attributes—individualized care, respectful, and empowering—were incorporated into six interventions, there was only one intervention (Gothenburg person-centered care) reflecting all four attributes of person-centered care identified by Morgan and Yoder (Fors et al., 2017; Olsson et al., 2016).

3.4. Outcomes related to person-centered rehabilitation

Table 3 presents the outcomes examined in relation to person-centered rehabilitation in the studies. Various outcomes were identified, including physical ability, mood, quality of life, occupational performance and satisfaction, participation, autonomy, life satisfaction, rehabilitation satisfaction, self-efficacy, medication adherence, goal attainment, caregiver burden, and client-centeredness. The effects of person-centered rehabilitation on each of the 13 outcomes examined in the studies were all significant (n = 3), all non-significant (n = 3), or mixed (n = 7). The outcomes that were all significant included occupational performance and satisfaction, rehabilitation satisfaction, and client-centeredness, whereas the outcomes found to be all non-significant included participation, life satisfaction, and caregiver burden. Of the remaining outcomes showing mixed results (some significant and others not), physical ability, quality of life, and mood were more frequently examined in the studies than other outcomes, such as autonomy, self-efficacy, medication adherence, and goal attainment. In addition, physical ability was the most frequently examined outcome in the studies (n = 12) and was measured using various tools, such as the Klein-Bell Activity of Daily Living scale, the Assessment of Motor and Process Skills, the Katz Extended Index of Activity of Daily Living, the Barthel Index, and the Functional Independent Measure. Regarding physical ability, significant differences between the intervention and control groups were reported in two studies (Feldthusen et al., 2016; Redfern et al., 2008), and significant changes during the intervention period were reported in one study (Wressle et al., 2002) while no significant results were reported in nine studies.

4. Discussion

In this review, we explored the current status of research about rehabilitation that embraced the concept of person-centered care

Table 2
Person-centered Rehabilitation Interventions and Related Attributes of Person-Centered Care.

Study No	Intervention	Attribute
1, 2, 5, 6, 9, 10	***Client-Centered Intervention using COPM***	Individualized Respectful Empowering
	1 Establish a collaborative partnership between the therapist and the client	
	2 Identify personally meaningful daily activities that patients are having difficulty to carry out (occupational performance issues)	
	3 Set goals for activities the patient needs and wants to perform as the therapist enables the patient to make his/her own decision and choices	
	4 Plan strategies by identifying barriers and facilitators of participation in the rehabilitation activities	
	5 Do the rehabilitation activities with the chosen strategies to achieve identified goals	
3	***Goal setting protocol***	Individualized Respectful Empowering
	1 Initial assessment by multidisciplinary team	
	2 Provide workbook that explains goal setting to patient	
	3 Key worker interview focused on patient experience to facilitate advocate role within goal setting	
	4 Joint assessment by treating multidisciplinary team	
	5 Goals discussed by treating therapists and patient	
	6 Patient completes workbook with key worker	
	7 Goal setting by therapists and patient working together	
	8 Provide a written copy of goals and opportunity to disagree or reword goals to patient	
4	1 Conduct a complete risk factor assessment that is used to guide patients' choice about mutually agreed 3-month goals	Individualized Respectful Empowering
	2 Patient selects from a menu strategy for lowering a given risk factor	
	3 Patient makes a self-commitment to a written action plan and is formally referred to the relevant intervention	
	4 Provide a resource package to patients, including previously tested and validated information leaflets	
	5 Open communication about their goals and modules to encourage patients	
7, 11	1 A collaborative decision between the patient and the therapist is made to either engage in or terminate the therapy	Individualized Respectful Empowering
	2 The patient and the therapist determine how they work together by clarifying expectations and identifying priority issues and possible goals	
	3 Assessment or evaluation of personal, environmental and occupational factors that underlie the patient's issues	
	4 The patient and the therapist establish goals and agree on the objectives and plan of intervention	
	5 Implement the plan with patient participation and power-sharing	
8	***Patient-Centered Rehabilitation Model with Cognitive Impairment (PCRM-CI)***	Individualized Respectful Empowering
	1 Develop patient goals with input from family caregivers	
	2 Support and educate for family caregivers, including best strategies to keep family members mobile and independent	
	3 Discuss a target discharge date and set amongst the patient, family, and staff	
12	***Person-Centered Physical Therapy***	Individualized Respectful Empowering
	1 Initiate with an individual person-centered meeting and establish a partnership between the participant and the physical therapist	
	2 Develop a self-care plan jointly focusing on tailoring health-enhancing physical activity and balancing life activities	
	3 Physical therapists support and coach each participant in developing a self-care plan, and tailor physical activity according to his/ her resources, context, will, and personal and environmental needs	
13	***Patient-centered Self-management Education Program***	Individualized Empowering
	1 Guide patients' active involvement in the educational process using didactic methods (short lectures, group discussions, practice, partner work, and individual work)	
	2 Didactic materials includes presentations, flipcharts, and patient booklets	
	3 Contents of lessons include treatment knowledge with regard to individual information needs of the patients	
	4 Discuss about illness related problems in everyday life and signs of emotional distress with regard to disease and coping strategies	
14, 15	***Gothenburg Person-Centered Care (gPCC)***	Holistic Individualized Respectful Empowering
	1 Establish a partnership and obtain a narrative from each patient, covering the patient's everyday life, resources, motivation, and goals	
	2 Make a tentative and detailed PCC health plan based on the narrative	
	3 The health plan is discussed with the patient and finalizes when an agreement is reached between the professionals and the patient	
	4 The patients are helped to familiarize themselves in the situation and to achieve their goal	
16	***Individualized Coaching Program***	Holistic Individualized
	1 Assess relevant problems (e.g., cognition, mood, life situations)	
	2 Discuss about risk factor management, review of therapy, and clinical evolution	
	3 Follow-up contact after discharge by repeat calls if necessary and at ambulatory consultations at 1, 3, 6 & 12 months	
17	***Community Aging in Place, Advancing Better Living for Elders (CAPABLE)***	Individualized Respectful
	1 Each older adult and occupational therapist collaboratively select up to 3 goals	
	2 Occupational therapist and older adult prioritize a work order for home repair or modifications to support goal attainment	
	3 The intervention includes RN visits that involve collaborative goal setting focused on pain and mood management, fall prevention, strength and balance, medication complexity, and primary care communications	
	4 Goals are person-directed and selected in partnership with either the RN or the occupational therapist	
	5 The RN and occupational therapist communicate about the respective goals	

Note. COPM = Canadian Occupational Performance Measure; RN = registered nurse.
Study No refers to the reference number of included studies from Table 1.

Table 3
Outcomes related to Person-Centered Rehabilitation Interventions.

Outcome	SD	SC	NS
Physical ability	Redfern et al. (2008),Feldthusen et al. (2016)	Wressle et al. (2002)	Holiday et al. (2007), Guidetti et al. (2010), Spooren et al. (2011), Eyssen et al. (2013), McGilton et al. (2013), Bertilsson et al. (2014), Guidetti et al. (2015), Sackley et al. (2015), Meng et al. (2016)
Mood	Eyssen et al. (2013), Bertilsson et al. (2014), Feldthusen et al. (2016)		Holiday et al. (2007), Redfern et al. (2008), Sackley et al. (2015)
Quality of life	Redfern et al. (2008), Eyssen et al. (2013)		Egan et al. (2007), Sackley et al. (2015), Meng et al. (2016)
Occupational performance & satisfaction	Egan et al. (2007), Eyssen et al. (2013)	Wressle et al. (2002), Spooren et al. (2011)	
Participation			Egan et al. (2007), Eyssen et al. (2013), Bertilsson et al. (2014), Guidetti et al. (2015)
Autonomy	Holiday et al. (2007)		Eyssen et al. (2013), Guidetti et al. (2015)
Life satisfaction			Guidetti et al. (2010), Bertilsson et al. (2014), Guidetti et al. (2015)
Rehabilitation satisfaction	Holiday et al. (2007), Eyssen et al. (2013), Meng et al. (2016)		
Self-efficacy	Feldthusen et al. (2016), Fors et al. (2017)		Meng et al. (2016)
Medication adherence		Vanacker et al. (2017)	Meng et al. (2016)
Goal attainment		Walderen et al. (2017)	Holiday et al. (2007)
Caregiver burden			Guidetti et al. (2010), Bertilsson et al. (2014)
Client-centeredness	Eyssen et al. (2013)		

Note. SD = significant differences between intervention and control groups, SC = significant changes, NS = no significant differences.
Contents in the column refer to the first author (year) of included studies from Table 1.

focusing on person-centered rehabilitation interventions and related outcomes. Based on our search strategy with a wide range of terms related to "person-centered" that often were used interchangeably in rehabilitation research, including "patient-centered" and "client-centered," 17 studies with various health conditions needing rehabilitation, such as stroke, chronic heart disease, and musculoskeletal, were included in this review. Although it was challenging to extract and synthesize pertinent data from each of the studies, given their heterogeneous characteristics, including research design, settings, and intervention modules, findings indicated that researchers have made various attempts to better understand the person-centered care concept and to develop an effective person-centered rehabilitation practice in recent years. However, a relatively higher number of those studies were rated to have very low quality due to several methodological issues, such as quasi-experimental research design and insufficient sample size, which raises a question about the adequacy of evidence to support the positive effects of person-centered practice on rehabilitation outcomes. This finding is consistent with results of previous systematic reviews that more research with high methodological quality is needed to develop evidence-based guidelines for person-centered care in daily rehabilitation practice (Olsson et al., 2013; Rosewilliam et al., 2011).

As in all other health care settings, health care professionals have been increasingly recognizing the person-centered approach as an essential component to attain better outcomes for individuals with disability or impairment (Bertilsson et al., 2014; Flink et al., 2016). In addition to the general lack of scientific rigor in research about person-centered rehabilitation care, findings indicated that the person-centered care concept has not yet been fully adopted and implemented in rehabilitation settings. The term person-centered care was used non-specifically in rehabilitation research and apparently also in rehabilitation practice. Similar to the results from two previous systematic review studies about person-centered care (Kogan et al., 2016; Olsson et al., 2013), there is still a lack of consensus about the definition of person-centered care that would allow clear operationalization of the person-centered approach to care provision in rehabilitation. Thus, the meaning and implementations of person-centered care for rehabilitation were unclear. To facilitate the implementation of person-centered care in this setting, it would be necessary to establish a single and consensus definition of the person-centered care concept. Recently, a standardized and agreed-upon definition and essential elements of person-centered care for older adults with chronic conditions and/or functional limitations was presented by the American Geriatrics Society Expert Panel on person-centered care (2016), which can be helpful to improve the current implementation of person-centered care for older adults. It might also be considered for application generally in other health care settings, although this review builds on the definition and attributes from a concept analysis of person-centered care that was conducted in the context of an inpatient rehabilitation setting (Morgan and Yoder, 2012).

Moreover, based on the four core attributes of the person-centered care concept—holistic, individualized, respectful, and empowering (Morgan and Yoder, 2012)—most interventions included in this review focused only on a specific attribute, mostly individualized for personal needs and preferences in developing a shared decision-making and goal-setting process, but hardly implemented a holistic–biomedical, psychosocial, and spiritual–approach, which is the most fundamental attribute of person-centered care (Lines et al., 2015; Zhao et al., 2016). Considering the holistic approach that recognizes the patients/clients as whole persons and allows health care professionals to better understand them in a broad context and provide integrated care rather than simply responding to personal needs and preferences or prompting patients/clients to follow predefined treatment plans (Morgan and Yoder, 2012; Silva, 2014), it would be a big challenge to deliver person-centered care in acute care settings where rapid diagnosis and short-term treatment are priorities for patients with severe or critical conditions (Clissett et al., 2013). In other health care settings, such as long-term and palliative care in which individualized and comprehensive care can usually be provided while building a relatively long-term relationship (Zhao et al., 2016), however, there are also a variety of barriers to delivering effective person-centered care that can sustain personhood in practice in these settings, such as physician workload, provider concerns for risk and safety, and lack of advance care planning (American Geriatrics Society Expert Panel [AGS], 2016; Ekman et al., 2011). To

address this gap between the concept and the actual practice of person-centered care, those barriers should be considered in future research focusing on the development of evidence-based care plans to integrate a holistic approach in person-centered practices.

Regarding the outcomes examined in this review, including physical ability and rehabilitation satisfaction, the effects of the interventions on those outcomes were generally inconclusive, which is similar to the findings from two previous systematic studies about patient-centered care and outcomes (Cheng et al., 2016; Rathert et al., 2012). For physical ability, which is an important rehabilitation outcome, non-significant improvements were found in the majority of studies. This might be related to several factors affecting rehabilitation interventions, such as the intervention time periods being too short for a rehabilitation problem and the severity of patient conditions (Eyssen et al., 2013). Considering the nature of rehabilitation, which might require a long care process to make significant improvements in functional outcomes (Egan et al., 2007; Winstein et al., 2016), continuity of care is an important aspect of rehabilitation care and more research is needed to incorporate transitional care from inpatient acute care settings to outpatient care and community-based care settings when developing person-centered care (Kogan et al., 2016).

On the other hand, the effects of interventions on occupational satisfaction and rehabilitation satisfaction were found to be significant in all studies examining this relationship. In rehabilitation settings, patient/client satisfaction can be influenced by whether expectations of care are met through active interaction in a shared decision-making process to set a goal tailored to unique individual needs, which is an important part of effective implementation of person-centered rehabilitation care (AGS, 2016; Morgan and Yoder, 2012; Rosewilliam et al., 2011). Patient/client satisfaction with the care experience has been an important outcome for enhancing quality care in health care settings (Manary et al., 2013). Thus, this finding provides valuable evidence to support the positive values of person-centered rehabilitation, which would ultimately improve long-term rehabilitation outcomes, such as physical ability and quality of life.

There are some limitations that should be considered when interpreting the results of this review. To retrieve a large number of studies about the concept of person-centered care implemented in rehabilitation, the search term was not limited to “person-centered.” We employed a search strategy with a wider range of person-centered care related terms used in the literature, including “patient-centered” and “client-centered.” Given the subtle differences in the meanings of those terms, this search strategy might not be beneficial although we found many studies about person-centered care in rehabilitation settings. In addition, the number of eligible studies was limited based on our selection criteria. Therefore, this review was limited by the information clearly provided in the studies that were all quantitative as well as published only in English. Finally, another limitation of this review was related to data extraction and synthesis. It was difficult to compare and combine findings across the studies due to the variety of methods, interventions, and outcome measures.

Despite these limitations, the findings of this systematic review provide valuable evidence to support further efforts for implementing person-centered services in rehabilitation settings. To develop true person-centered care services for rehabilitation that are successfully implemented and sustained in various care settings, including acute care hospitals and community-based settings, it is necessary to better understand the nature of person-centered care. The actual implementation and relevant outcomes of person-centered care should be examined in further studies with rigorous research designs.

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