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Self-management priority setting and decision-making in adults with multimorbidity: A narrative review of literature

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Abstract

Objectives—The purpose of this narrative review was to synthesize current research findings related to self-management, in order to better understand the processes of priority setting and decision-making in among adults with multimorbidity.

Design—A narrative literature review was undertaken, synthesizing findings from published, peer-reviewed empirical studies that addressed priority setting and/or decision-making in self-management of multimorbidity.

Data sources—A search of PubMed, PsychINFO, CINAHL and SocIndex databases was conducted from database inception through December 2013. References lists from selected empirical studies and systematic reviews were evaluated to identify any additional relevant articles.

Review methods—Full text of potentially eligible articles were reviewed and selected for inclusion if they described empirical studies that addressed priority setting or decision-making in self-management of multimorbidity among adults. Two independent reviewers read each selected article and extracted relevant data to an evidence table. Processes and factors and processes of multimorbidity self-management were identified and sorted into categories of priority setting, decision-making, and facilitators/barriers.

Results—Thirteen articles were selected for inclusion; most were qualitative studies describing processes, facilitators, and barriers of multimorbidity self-management. The findings revealed that patients prioritize a dominant chronic illness and re-prioritize over time as conditions and treatments change; that multiple facilitators (e.g. support programs) and barriers (e.g. lack of financial resources) impact individuals' self-management priority setting and decision-making ability; as do individual beliefs, preferences, and attitudes (e.g., perceived personal control, preferences regarding treatment).

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Conclusions—Health care providers need to be cognizant that individuals with multimorbidity engage in day-to-day priority setting and decision-making among their multiple chronic illnesses and respective treatments. Researchers need to develop and test interventions that support day-to-day priority setting and decision-making and improve health outcomes for individuals with multimorbidity.

Keywords

Comorbidity; Chronic Disease; Decision-Making; Disease Management; Priority Setting; and Self-Management

1. Introduction

Chronic illnesses are ongoing health conditions that can be controlled but not cured. According to the Centers for Disease Control and Prevention (CDC), chronic illnesses are the leading causes of death and disability in the United States (CDC, 2012). Approximately seven out of 10 deaths can be attributed to chronic diseases (Kung et al., 2008). The term multimorbidity refers to the occurrence of two or more chronic illnesses at the same time. Multimorbidity is a growing concern in public health due to its high prevalence and poor outcomes. In the United States, more than one in four adults and in nearly three quarters of adults aged 65 or older have multimorbidity (Anderson, 2010). Persons with multimorbidity are at a greater risk for disability and are more likely to be hospitalized than persons with a single chronic illness (Anderson, 2010). Over time, unmanaged multimorbidity can negatively affect cognitive (Aarts, 2011) and physical function (Griffith et al., 2010; Kadam and Croft, 2007; Stewart et al., 1989) ability to maintain employment (Boyd and Fortin, 2010; van den Akker et al., 2000) and relationships, and overall quality of life (Institute of Medicine, 2012).

Chronic illness requires a person to adhere to a self-management regimen in order to maintain optimal health and avoid life-threatening complications. Consequently, patients with multimorbidity may have to follow several complex self-management regimens prescribed by multiple specialty health care providers. For example, persons with heart failure (HF) must adhere to a cardiac diet; take cardiac medications on schedule, and monitor weight, breathing, and other symptoms to detect CHF exacerbations. Persons with HF who have a concurrent diagnosis of depression must take all of those steps while also remembering to attend psychotherapy sessions, take antidepressant medications and practice cognitive-behavioral strategies to manage daily psychological and emotional challenges.

In a subset of patients with multimorbidity, self-management demands may conflict across conditions resulting in the need for highly complex priority setting and decision-making. For example, a patient with cancer, Type 2 diabetes, and a history of atrial fibrillation may have to balance the effects of taking anticoagulants while on chemotherapy that is expected to reduce platelet count; follow a diabetic diet while also eating extra calories to minimize cancer-related cachexia; and manage unstable glucose levels and hyperglycemia induced by steroid premedication for chemotherapy. When the number of activities and time required to perform self-management becomes too burdensome, patients may make decisions about

which self-care management activities will be a priority, and which may be delayed or simply not completed.

The need for prioritization and decision-making regarding self-management is a significant concern among patients with multimorbidity. Self-management is often described simply as the day-to-day activities that individuals engage in to control a chronic illness. More detailed definitions emphasize choosing proper treatment options, adhering to treatment regimens, making health-related lifestyle changes, monitoring and managing signs and symptoms of the illness and treatment, and compensating for physical and social consequences of the illness (Center for the Advancement of Health, 2002; Coleman and Newton, 2005; Novak et al., 2013). In defining self-management, previous studies note the importance of the patient provider-relationship, but it is clear that self-management is what the patient does to manage the illness, not what the clinician does with or for the patient. While some definitions of self-management include emotional coping activities (Kralik et al., 2004), for the purpose of this review, self-management is defined as behaviors and activities an individual employs for the practical management of an illness, such as taking medications, and managing physical or functional effects of the illness.

According to Lorig and Holman (2003), two skills used in self-management are the ability to set priorities and the ability to engage in decision-making. Specifically, priority setting refers to the importance or urgency an individual places on a specific illness or self-management practice, and decision-making refers to the choices an individual makes related to the practice of chronic illness self-management. The processes of day-to-day priority setting and decision-making usually originate from individual experiences (i.e., trial and error) rather than medical advice/instructions (Haslback et al., 2012). Both skills are implicit, individualized, iterative processes used frequently and regularly by individuals to manage their chronic illnesses (Novak et al., 2013; Thorne et al., 2003). Therefore the processes go hand in hand in that both steps are necessary to engage in self-management behavior (i.e. priority setting requires decision-making and decision-making requires prioritization to rank self-management tasks). For example, one study reported that individuals with a single chronic illness (i.e., diabetes) make approximately 20 choices per day related to self-management of their disease (Paterson et al., 2002). Given these findings, one can better understand how important priority setting and decision-making are for individuals with multimorbidity. Although priority setting and decision-making are central processes in self-management, their use among individuals with multimorbidity is poorly understood. Therefore, the purpose of this narrative review was to synthesize current research findings related to self-management in order to better understand the processes of priority setting and decision-making among adults with multimorbidity. Given the paucity of literature and theoretical frameworks related to self-management in multimorbidity, a narrative review approach is presented as recommended by Cronin, Ryan, and Coughlan (2008); focused on gathering information about self-management in multimorbidity, rather than answering a specific research question.

2. Methods

2.1 Eligibility Criteria

Published, peer reviewed empirical studies that addressed priority setting or decision-making in self-care or self-management of multiple chronic illnesses were eligible for inclusion in the review. Articles that focused on 1) a single chronic illness, 2) pediatric population, or 3) health care provider decision-making, as opposed to patient decision-making, were excluded. Published abstracts were excluded. Review articles were used for ancestral searching of reference lists only.

2.2 Informational Sources and Search

PubMed, PsychINFO, CINAHL Plus, and SocINDEX online databases were searched using the terms [*chronic illness OR comorbidity OR chronic disease(s) OR multiple morbidity*] AND [*self-management OR disease management OR self-care OR symptom management*] AND [*priority OR decision OR decision-making*]. Searches were conducted from database inception through December 2013 and were limited to English language. Additional articles were identified through ancestral searching of reference lists. No attempts were made to contact authors for more information.

2.3 Study Selection

Abstracts were screened for eligibility and at least two reviewers (LB, RM, KK, KSL, EW or KKK) read full text articles for those that appeared to fit criteria or that were questionable. If there was any disagreement about eligibility between the two reviewers, all six reviewers read and discussed the article until consensus was reached.

2.4 Data Collection Process

When the final set of articles was selected, two reviewers independently extracted data from the articles. Information related to priority setting and decision-making were extracted and included: 1) purpose(s), 2) hypotheses or research questions, 3) sample and setting, 4) design/intervention, 5) data collection and measures and 6) findings/conclusions of the study. Reviewers met and compared their data extractions, combining them into a single evidence table. Disagreements were discussed among all reviewers until consensus was reached.

2.5 Synthesis of Results

No existing theoretical framework was used to organize our findings. We identified processes and factors of multimorbidity self-management and summarized them to identify their breadth rather than quantifying frequency. Individual considerations that influence priority setting and decision-making were conceptualized as ‘internal processes and factors’. Internal processes and factors are involved in weighing options to reach a conclusion (e.g., priority setting and decision-making). Facilitators/Barriers were conceptualized as external factors that helped or hindered one’s ability to establish self-management priorities, and make a decision to engage in self-management behavior.

3. Results

3.1 Search Outcome

The search resulted in a total of 154 potential articles. Seventy-one abstracts either appeared to meet criteria or required further review. After review of the 71 full text articles, 13 were found to meet criteria and were included in the current review. Numbers of records identified, numbers included and excluded, and reasons for exclusion are outlined in Figure 1. A brief summary of study characteristics and findings is presented in Table 1.

3.2 Study Characteristics

3.2.1 Study Designs/Methods—All except one study (Kerr et al., 2007) used a qualitative study design. Three studies used grounded theory (Fix et al., 2013; Jerant et al., 2005; Loffler et al., 2012), one used ethnography (Schoenberg, 2009) and the others described narrative or constant comparative approaches (Bayliss et al., 2003; Bower et al., 2012; Fried et al., 2008; Townsend et al., 2003). In several studies the specific qualitative approach was not described or was described simply as a qualitative interview (Lindsay, 2009; Morris et al., 2011; Schoenberg et al., 2011; Townsend et al., 2006). In the majority of studies, investigators collected data through individual interviews (Bayliss et al., 2003; Bower et al., 2012; Fix et al., 2013; Loffler et al., 2012; Morris et al., 2011; Schoenberg et al., 2011; Schoenberg et al., 2009; Townsend et al., 2003; Townsend et al., 2006) while others used focus groups (Fried et al., 2008; Jerant et al., 2005; Lindsay, 2009). Interviews commonly used semi-structured question guides with open-ended questions. Only one study used a quantitative design, which was a cross-sectional survey study (Kerr et al., 2007).

3.2.2 Focus/Purpose of Studies—As the majority of studies were qualitative, their focus was on describing various aspects of the multimorbidity patient experience. Six studies were conducted to describe the processes or strategies of self-management of multimorbidity (Lindsay, 2009; Loffler et al., 2012; Morris et al., 2011; Schoenberg et al., 2011; Schoenberg et al., 2009; Townsend et al., 2006). Four studies had purposes to describe beliefs about multimorbidity self-management (i.e., medication use) or competing outcomes of comorbid chronic conditions (Bower et al., 2012; Fix et al., 2013; Fried et al., 2008; Townsend et al., 2003). Two studies were specifically conducted to identify barriers to self-management of chronic illnesses (Bayliss et al., 2003; Jerant et al., 2005). The purpose of the quantitative study was to describe how the number, types, and severity of comorbidities affect diabetes self-management and prioritization (Kerr et al., 2007).

3.2.3 Sample & Setting—Consistent with qualitative research, the vast majority of samples were composed of small numbers of participants (sample sizes range from 19–66). The quantitative study had a much larger sample with 1901 participants (Kerr et al., 2007). Most samples were small and primarily Caucasian. About half of the studies involved samples that were > 50% female (Bayliss et al., 2003; Fried et al., 2008; Jerant et al., 2005; Loffler et al., 2012; Schoenberg et al., 2011; Townsend et al., 2006); three studies had predominantly male samples (Fix et al., 2013; Lindsay, 2009; Morris et al., 2011). The majority of study participants were > 40 years old. Mean age in most studies was > 60 years old (Bayliss et al., 2003; Bower et al., 2012; Fix et al., 2013; Fried et al., 2008; Kerr et al.,

2007; Lindsay, 2008; Loffler et al., 2012; Morris et al., 2011; Schoenberg et al., 2009). Five studies were conducted in Europe (Germany, UK, Scotland) (Bower et al., 2012; Lindsay, 2009; Loffler et al., 2012; Morris et al., 2011; Townsend et al., 2003; Townsend et al., 2006) and all other studies were conducted in the United States. Participants in eight studies were recruited from clinical settings including primary care physician offices (Bayliss et al., 2003; Bower et al., 2012; Jerant et al., 2005; Lindsay, 2009; Loffler et al., 2012; Morris et al., 2011), VA medical centers (Fix et al., 2013), and a federally funded health clinic (Schoenberg et al., 2011). Two studies used health related registries or health surveys to identify potential participants (Kerr et al., 2007; Townsend et al., 2003; Townsend et al., 2006). Other recruitment sites included senior centers, congregate housing, churches, and civic meetings (Fried et al., 2008; Schoenberg et al., 2009). There was significant variability in the number and types of chronic illness conditions experienced by study participants, with the number of co-morbid conditions ranging from 2 to 10. This is important to consider as complexity of self-management activities will differ based on the co-morbid conditions experienced.

3.3 Multimorbidity Self-Management Priority Setting and Decision-Making

The processes and factors related to either category are depicted in Figure 2.

3.3.1 Internal processes – priority of dominant illness—Several authors noted that individuals with multimorbidity prioritized self-management activities by identifying one condition as the dominant or main illness (Bayliss et al., 2003; Fix et al., 2013; Fried et al., 2008; Lindsay, 2009; Schoenberg et al., 2009; Schoenberg et al., 2011; Townsend et al., 2006). Lindsay (2009) identified three ways in which patients prioritized one chronic illness over others. Participants prioritized the illness that (1) tended to “set off” the others; that is, an illness that when uncontrolled could cause flares, symptom exacerbations, or diminished control over other illnesses; (2) could not be managed by taking medications; or (3) had an unpredictable course (i.e., those for which self-management needs could not be anticipated from day-to-day). Other authors similarly noted that a dominant illness was based on perceived severity and impact on daily life (Bayliss et al., 2003; Bower et al., 2012; Lindsey, 2009; Schoenberg et al., 2009). However, among the studies reviewed, there was a great deal of variability related to how perceived severity and impact on daily life were determined by patients. For some individuals, severity was determined by the illness that was the most worrisome (Lindsey, 2009). For others, the illness with the most physical symptoms that threatened an individual’s ability to maintain independence became the dominant illness (Schoenberg et al., 2009). Other authors reported that the illnesses that contributed to ‘global outcomes’, such as functional status, quality of life, and changes in social roles were prioritized higher than illnesses that affected only disease specific outcomes such as glucose levels and blood pressure (Bower et al., 2012; Lindsay, 2009; Townsend et al., 2006; Fried et al., 2008). Schoenberg and colleagues (2009) reported that some individuals prioritized ‘asymptomatic’ illnesses higher because those illnesses may cause serious harm without any warning. Illnesses that were well controlled were given lower priority (Bower et al., 2012).

Two research groups discussed how the dominant illness may change over time. For example, Morris and colleagues (2011) noted that reprioritization occurred when patients perceived that one condition or treatment was negatively affecting another condition, or when the relative importance of certain self-management practices changed. In the only quantitative study, Kerr et al. (2007) reported that the presence of other co-morbidities affected diabetes self-management. Individuals with more co-morbidities or more severe co-morbidities (e.g. severe heart failure) placed a lower priority on diabetes self-management than persons with fewer, less severe comorbidities. Discordant comorbidities (i.e., conditions that do not share a common underlying pathology, predisposing variables or management strategies) also reduced prioritization of diabetes.

3.3.2 Internal factors - decision-making—Decision-making about self-management was discussed in six studies (Bayliss, et al., 2003; Bower et al., 2012; Jerant et al., 2005; Morris et al., 2011; Schoenberg et al., 2011; Townsend et al., 2006) and largely reflected personal beliefs, preferences, attitudes, and perceptions of one's capacity to engage in recommended self-management behavior. Several authors reported that decision-making was informed by patients' beliefs about their illnesses and prescribed treatments. Patient agreement with the provider's recommendations for treatment and goals (Loffler et al., 2012; Morris et al., 2011; Schoenberg et al., 2011) as well as general preferences regarding medication use (i.e., the belief that medications should not be used) (Loffler et al., 2012; Schoenberg et al., 2011; Townsend et al., 2003) were important factors in decision-making about self-management. For example, Morris et al. (2011) explained that when patients and providers were not in agreement about priorities and management goals, patients were less likely to decide to follow the recommended regimens.

Participants in Townsend's (2006) study decided not to employ self-management strategies that they viewed with a negative connotation or that conflicted with their self-image. For example, one participant reported that he would rather limp than use a cane because the cane carried the connotation of being ill versus the limp, which was more indicative of normal aging. Several authors found that patients' decision-making was influenced by perceived synergies, antagonistic effects, and interactions among the conditions and prescribed treatments (Bayliss et al., 2003; Bower et al., 2012; Fix et al., 2013; Schoenberg et al., 2011). Individuals decided to engage in treatment when they believed that the self-management strategy was beneficial for more than one of their conditions, and did not engage in the treatment when there were concerns about detrimental effects on other conditions. The perception of how easy or difficult the treatment was also played a role in decision-making (Lindsay, 2009; Schoenberg et al., 2011). For example, participants in Schoenberg's (2011) study noted that they did not make lifestyle changes to support weight loss because they were perceived as too difficult.

Other individual factors involved in decision-making reflected sociocultural values and cumulative effects of multimorbidity on the individual's physical, emotional, and psychological capacity. Sociocultural values were addressed in two studies, primarily with regard to making decisions that supported one's ability to maintain valued social roles and expected behaviors (Schoenberg et al., 2011; Townsend et al., 2006). Six studies noted that diminished functional status contributed to decision-making about self-management

behavior (Bayliss et al., 2003; Fix et al., 2013; Jerant et al., 2005; Lindsay, 2009; Loffler et al., 2012; Morris et al., 2011). Emotional impact of the illness, particularly depression, also played a role in decision-making, with depressed mood detracting from the ability to engage in self-management behavior (Bayliss et al., 2003; Jerant et al., 2005; Lindsay, 2009; Schoenberg et al., 2011). Bayliss and colleagues (2003) also noted that perceptions of personal control and self-efficacy for self-management behaviors influenced the decision to engage in the treatment.

Because many treatment regimens focus on the use of medications, decision-making about medication use was discussed in multiple studies (Bower et al., 2012; Fried et al., 2008; Loffler et al., 2012; Schoenberg et al., 2009; Schoenberg et al., 2011; Townsend et al., 2003). A general dislike and ambivalence over taking medications, undesirable side effects of medications, or the belief that a medication would negatively affect health guided decisions to not follow recommendations for medication use (Townsend et al., 2003; Fried et al., 2008; Loffler et al., 2012; Schoenberg et al., 2009). Other authors found that patients decided not to take medications based on perceptions that the medications were not necessary or not appropriate for the underlying condition (Bower et al., 2012). For example, some patients did not believe that medications were an appropriate strategy for managing depression.

3.3.3 External Factors - Facilitators/Barriers—All but three studies described facilitators/barriers to priority setting and decision-making in self-management (Bayliss et al., 2003; Fix et al., 2013; Fried et al., 2008; Jerant et al., 2005; Lindsay, 2009; Loffler et al., 2012; Morris et al., 2011; Schoenberg et al., 2009; Schoenberg et al., 2011; Townsend et al., 2003). Not surprisingly, lack of resources (e.g., knowledge, finances, social support, transportation) was central to patients' decision-making and prioritization of self-management activities (Bayliss et al., 2003; Jerant et al., 2005; Schoenberg et al., 2011). One participant in the study by Jerant and colleagues (2005) indicated that her self-management decisions might be facilitated through a self-management program that was delivered in-home rather than at a treatment center. Undesired treatment side effects were frequently noted to impact self-management priority setting and decision-making (Fix et al., 2013; Fried et al., 2008; Loffler et al., 2012; Schoenberg et al., 2011; Townsend et al., 2003). Other common factors that could act as facilitators or barriers to self-management priority setting and decision-making were the quality of communication with providers (Bayliss et al., 2003; Jerant et al., 2005; Lindsay, 2009), confusing or contradictory treatment recommendations received from multiple health care providers (Bayliss et al., 2003; Fix et al., 2013; Jerant et al., 2005; Lindsay, 2009; Morris et al., 2011; Schoenberg et al., 2011), and the overall number of medications prescribed and complexity of regimens (Bayliss et al., 2003; Morris et al., 2011; Schoenberg et al., 2011; Townsend et al., 2006).

3. Discussion

The purpose of this narrative review was to synthesize current research findings related to self-management, in order to better understand self-management priority setting and decision-making among adults with multimorbidity. The literature suggests that priority setting and decision-making are implicit, iterative processes. Findings indicated that

multiple individual processes, factors and facilitators/barriers affect individuals' self-management priority setting and decision-making ability.

Patients with multimorbidity prioritize illnesses. Multiple processes affect choice of a priority or "dominant" chronic illness. For example, the number and inter-relatedness of chronic conditions, their severity and impact on daily life, the symptoms they cause, and their short- and long-term consequences may influence the identification of a dominant illness. The dominant chronic illness shifts over time as conditions and treatments change, and re-prioritization occurs.

Given the competing demands of each illness, patients are tasked with prioritizing and making decisions about the most significant concerns so that they can select and order their self-management behaviors. The literature reviewed suggested that this often happens at the disease level, prioritizing one chronic condition over other comorbidities. In a review conducted to identify the process of chronic illness self-management, Schulman-Green and colleagues (2012) similarly identified the need to prioritize self-management activities as part of becoming "expert" and taking responsibility for managing a long-term health condition. Lacking from current literature was a focus on the day-to-day or even minute-to-minute priority setting that must occur to complete various self-management activities (e.g., diet choices, taking medication, measuring glucose levels, or monitoring bodily cues) throughout the day.

Decision-making is a concept that is crucial for day-to-day self-management of multimorbidity. In our review, decision-making was most often identified in the context of following or adhering to recommended treatment regimens. Such decisions were influenced by the perceived negative or positive connotation of the self-management behavior, its benefit or detriment to other comorbid conditions, one's desire to preserve a "normal" self-image, minimize or avoid side effects, and conserve resources. These individual perceptions may or may not accurately reflect the effects of various self-management strategies (i.e., a patient may not take a medication based on an inaccurate perception that it is harmful to another condition). Our findings are consistent with literature by Garro (1998) postulating that decision-making is grounded in the personal and social context of an individual's life. Findings are also consistent with a framework for decision-making in chronic illness in which Thorne and colleagues (2003) propose that individuals take control of their illness in order to live as 'normally as possible' and weigh the use of medications against possible side effects and long term complications.

The patient's role in decision-making is expanding for reasons such as increased access to information, greater expectations for autonomy in health care decisions, availability of a growing number of treatment options, and increasing recognition of the importance of considering patient preferences and values in evidence-based practice (Woolf et al., 2005). Yet patient involvement in self-management decision-making in multimorbidity may be overlooked, especially for select populations. For example, in work to identify research priorities for older adults with multiple chronic conditions, experts focused on system variables, pharmacotherapies, illness prevention, palliative care, long-term care, hospitalization, and mental health, but only briefly discussed patient decision-making in

suggesting the need to develop structures that help patients participate in shared decision-making with their health care providers (Norris et al., 2007). Similarly, Yen and colleagues (2010) interviewed 88 health care providers to elicit their responses to patient concerns about the challenges of managing comorbid conditions and found that health care providers focused on perceptions of patient unwillingness to engage in self-management, low health literacy, and poor motivation. No mention was made of the need to understand or better inform patients to facilitate effective self-management decision-making. Future research needs to address what actions by health care providers are most helpful in enabling effective decision-making in multimorbidity self-management.

There is a large body of work addressing decision-making in illness management (Edwards et al., 2013; Gravel et al., 2006; O'Connor et al., 1999; Say et al., 2006). Much of the work focuses on decision-support around choices to pursue or not pursue a particular treatment approach or selecting among major treatment options (e.g., surgical treatment for an elevated PSA versus watchful waiting). There is far less research exploring day-to-day decision-making that likely occurs multiple times throughout the day. For example, Paterson and Sloan (1994) described patients' expertise in learning to identify and respond intuitively to bodily cues throughout the day when they had longstanding diabetes (> 5 years). And while some investigators have focused on everyday self-management decision-making (Paterson et al., 2001; Thorne et al., 2003), it is within the context of a single chronic illness. Everyday decision-making may be far more complex and challenging when patients are balancing demands of multiple chronic conditions.

Facilitators and barriers to priority setting and decision-making in self-management are important to recognize. Our findings are consistent with facilitators/barriers identified in previous research on self-management of chronic illness, including disease and treatment knowledge, access to resources, financial/economic factors, and physical, cognitive, and emotional capacity for self-management (Bauman and Dang, 2012; Noël et al., 2007). Even multimorbidity itself is considered a barrier to self-management (Coleman and Newton, 2005). Structured disease self-management programs have addressed some facilitators/barriers (e.g., communication, access to resources), but they typically focus on strategies and resources specific to a single illness. There is a need for patient-centered intervention research targeting specific facilitators/barriers in common clusters of comorbid chronic illnesses (e.g., co-morbid Type 2 diabetes, cardiovascular disease and arthritis), with the goal of improving ability to set priorities and make decisions that lead to better health outcomes.

4.1 Limitations

This review is not without limitations. First, we did not explore or map the theories underlying the original studies (e.g., Corbin and Strauss's Chronic Illness Trajectory Model). As a consequence future investigators will need to identify appropriate conceptual frameworks to guide their studies. Second, we only included studies published in English, so there may be a selection bias in this review. Third, the relationships among processes and factors identified in our review (and depicted in Figure 2) are only propositions, as the cross sectional data reviewed cannot provide evidence of cause-and-effect or changes over time.

The figure is meant to visually organize our main findings and may stimulate consideration of directions for future research. Finally, we chose to restrict the focus of this review to practical aspects of illness self-management and, as such, our findings do not include decision-making and priority setting for self-management of emotional coping with multimorbidity.

4.2 Implications

The largely qualitative body of research has made an important initial contribution to our understanding of the self-management priority setting and decision-making process. More research is needed to understand everyday (day-to-day and minute-to-minute) self-management priority setting and decision-making in multimorbidity. Reviews and descriptive studies are necessary to identify common multimorbidity clusters, shared symptom pathways, and treatment strategies that might be effective across several co-occurring chronic illnesses.

It is also critical that investigators develop and test interventions to facilitate self-management priority setting and decision-making and to improve health outcomes. Absent in previous literature was any discussion of the role of health care providers in helping patients consider the effects of each illness; that is, to weigh the short- and long-term consequences, and make sure that prioritization among health conditions and self-management behaviors is based on accurate information. Patients with multimorbidity have called for the support of a single care coordinator with knowledge of multiple conditions that could help facilitate prioritization among competing self-management demands (Bayliss et al., 2008). Investigators should explore what kind of information and delivery strategies health care providers can use to enable effective patient self-management priority setting and decision-making. Intervention research can test strategies for successful self-management such as tailored interventions to overcome barriers to multimorbidity self-management, consultations provided by nurse care coordinators familiar with commonly comorbid conditions, and chronic illness self-management programs adapted to address common multimorbidity illness clusters (e.g., co-occurring heart disease, type 2 diabetes and arthritis).

Although research on multimorbidity is still somewhat in its infancy, implications for practice can be identified. Findings from this review indicate that patients want health care providers to help them prioritize among their chronic conditions and multiple self-management activities. Clinicians must recognize that while following all treatment recommendations and managing all chronic conditions equally well would be ideal, it is not necessarily practical or realistic. Health care providers can talk with patients about priority setting in order to assess patient understanding of the short- and long-term consequences of their choices. Bodenheimer et al. (2002) suggested that clinicians ask their patients, "What is your most important problem?" Based on patient response, clinicians should provide the appropriate resources (e.g. education and support) to enable patients to problem solve, and set goals to self-manage their chronic conditions. As condition status and treatments change over time, periodic reassessment of patient priorities and resources is needed to maintain optimal health outcomes.

4. Conclusion

The results of our review suggest that individuals with multimorbidity prioritize a dominant illness, make decisions that fit with personal preferences and values, utilize personal facilitators and struggle to overcome barriers to self-management that are prevalent and unresolved. Unfortunately, there is a paucity of literature related to everyday self-management of multimorbidity, interventions that support day-to-day priority setting and decision-making, and strategies to reduce barriers to self-management among individuals with multimorbidity. Investigators need to move forward in building the science around multimorbidity self-management through descriptive studies that identify processes and factors amenable to intervention and development and testing of interventions to support day-to-day priority setting and decision-making and improve health outcomes.

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Contributions of the Paper

What is already known about the topic?

- Multimorbidity, defined as two or more co-occurring chronic illnesses, is increasingly common among adults and older adults.
- Multimorbidity complicates the self-management process, particularly when multiple providers are involved and when treatment recommendations conflict.
- Effective self-management of chronic illness requires day-to-day priority setting and decision-making.

What this paper adds

- Priority setting and decision-making are iterative processes that go hand-in-hand in self-management of multimorbidity.
- Individuals' self-manage multimorbidity, in part, by identifying a dominant chronic illness that takes priority over other co-morbidities. Reprioritization of the dominant illness occurs as effects of chronic illnesses and their treatments change over time.
- Priority setting and decision-making in multimorbidity is influenced by individual processes and factors including personal beliefs, preferences, attitudes and perceptions of one's capacity to engage in the self-management behavior.
- Various facilitators (e.g., home-based self-management programs) and barriers (e.g., lack of resources, conflicting or confusing treatment recommendations, and treatment side effects) impact priority setting and decision-making in self-management of multimorbidity.

Figure 1.
Diagram of Search Results

Figure 2.
Self-Management Priority Setting and Decision-Making in Multimorbidity

Table 1

Summary of Included Studies

Study citation	Purpose	Sample & Design	Findings by Theme
Bayliss et al., 2003	To identify barriers to self-care	N=16 patients from family medicine clinics Qualitative semi-structured interviews	Internal processes – priority of dominant illness <ul style="list-style-type: none"> Seriousness of the illness and impact on life Individual factors – decision-making <ul style="list-style-type: none"> Emotional impact of the illness (e.g., depression) Functional capacity Perceived personal control/self-efficacy Perceived synergies, antagonistic effects, or interactions among illnesses and prescribed treatments Barriers/facilitators <ul style="list-style-type: none"> Available resources (e.g., knowledge, finances, social and practical support) Conflicting or confusing recommendations Number of medications and regimen complexity Quality of communication with health care providers
Bower et al., 2012	To understand patients' common sense representations of multimorbid long-term conditions	N=28 patients from general practice clinics Qualitative semi-structured interviews	Internal processes – priority of dominant illness <ul style="list-style-type: none"> Contribution to global outcomes (e.g., quality of life, survival) How well the illness is controlled Seriousness of the illness and impact on life Individual factors – decision-making <ul style="list-style-type: none"> Perceived synergies, antagonistic effects, or interactions among illnesses and prescribed treatments Perceived necessity/appropriateness of the treatment for the underlying illness
Fix et al., 2013	To understand patients' beliefs and experiences about hypertension (HTN) self-management in the presence of comorbidities.	N=48 patients with uncontrolled HTN and at least one comorbidity Qualitative, semi-structured interviews.	Internal processes – priority of dominant illness <ul style="list-style-type: none"> Inter-relatedness of comorbidities Order of diagnoses (e.g., newer vs. older conditions) Short and long-term consequences (e.g., functional limitations vs. survival) Individual factors-decision-making <ul style="list-style-type: none"> Functional capacity Perceived synergies, antagonistic effects, or interactions among illnesses and prescribed treatments Barriers/facilitators <ul style="list-style-type: none"> Conflicting or confusing recommendations Treatment side effects
Fried et al., 2008	To describe ways that older adults think about competing outcomes of multiple conditions.	N=66 older adults with multimorbidity and taking 5 or more medications	Internal processes – priority of dominant illness <ul style="list-style-type: none"> Contribution to global outcomes (e.g., quality of life, survival)

Study citation	Purpose	Sample & Design	Findings by Theme
		Focus groups	Barriers/facilitators <ul style="list-style-type: none"> Treatment side effects
Jerant et al., 2005	To identify perceived barriers to self-management, and accessing resources/support services	N=54 adults, with one or more chronic illnesses Focus groups	Individual factors-decision-making <ul style="list-style-type: none"> Emotional impact of the illness (e.g. depression) Functional capacity Barriers/facilitators <ul style="list-style-type: none"> Available resources (e.g., knowledge, finances, social and practical support) Conflicting or confusing recommendations Quality of communication with health care providers
Kerr et al., 2007	To understand how the number, type, and severity of comorbidities influence diabetes self-management	N=1901 adults with diabetes, aged 55 Quantitative cross-sectional survey	Internal processes – priority of dominant illness <ul style="list-style-type: none"> Changes with the number and severity of symptoms and comorbidities Concordance/discordance of comorbidities with the priority illness
Lindsay, 2009	To understand the process of self-management and how people with multimorbidity prioritize their health conditions	N=53 patients with > 1 chronic condition Focus groups	Internal processes – priority of dominant illness <ul style="list-style-type: none"> Conditions that cannot be managed with medications Conditions that have an unpredictable course Conditions that set others off Contribution to global outcomes (e.g., quality of life, survival) Order of diagnoses (e.g., newer vs. older conditions) Seriousness of the illness and impact on life Individual factors-decision-making <ul style="list-style-type: none"> Emotional impact of the illness (e.g. stress, depression) Functional capacity Perceived ease of the behavior/treatment Barriers/facilitators <ul style="list-style-type: none"> Available resources (e.g., social and practical support) Conflicting or confusing recommendations Quality of communication with health care providers
Loffler et al., 2012	To describe how older adults cope with multiple chronic diseases	N=19 patients aged 65–85 with 3 or more chronic conditions Qualitative interviews	Individual factors-decision-making <ul style="list-style-type: none"> Agreement with providers recommended treatment and goals Functional capacity Preferences regarding medication use Perceived necessity/appropriateness of the treatment for the underlying illness Barriers/facilitators <ul style="list-style-type: none"> Treatment side effects

Study citation	Purpose	Sample & Design	Findings by Theme
Morris et al., 2011	To identify illness management strategies in multimorbidity	N=21 patients with two or more co-morbid conditions Qualitative, semi-structured interviews	Internal processes – priority of dominant illness <ul style="list-style-type: none"> Changes when one illness negatively affects another Changes when perceived importance of self-management practices change Inter-relatedness of comorbidities Order of diagnoses (e.g., newer vs. older conditions) Individual factors-decision-making <ul style="list-style-type: none"> Agreement with providers recommended treatment and goals Functional capacity Barriers/facilitators <ul style="list-style-type: none"> Available resources (e.g., knowledge, finances, social and practical support) Conflicting or confusing recommendations Number of medications and regimen complexity
Schoenberg et al., 2009	To understand self-management and prioritization of chronic conditions in older adults with multimorbidity.	N=41 adults, aged 55, with two or more chronic illnesses Qualitative semi-structured interviews	Internal processes – priority of dominant illness <ul style="list-style-type: none"> Predictability of illness course Seriousness of the illness and impact on life Barriers/facilitators <ul style="list-style-type: none"> Available resources (e.g., finances, social and practical support)
Schoenberg et al., 2011	To understand how adults with multimorbidity manage co-occurring chronic health conditions.	N=20 adults with 2 chronic health conditions Qualitative semi-structured interviews semi-structured interviews	Internal processes – priority of dominant illness <ul style="list-style-type: none"> Inter-relatedness of comorbidities Resource allocation Individual factors-decision-making <ul style="list-style-type: none"> Agreement with providers recommended treatment and goals Emotional impact of the illness (e.g. depression) Perceived ease of the behavior/treatment Perceived synergies, antagonistic effects, or interactions among illnesses and prescribed treatments Preference regarding medication use Sociocultural values Barriers/facilitators <ul style="list-style-type: none"> Available resources (e.g., knowledge, finances, social and practical support) Conflicting or confusing recommendations Number of medications and regimen complexity Treatment side effects
Townsend et al., 2003	To understand attitudes about medication use in multimorbidity	N=23 adults with 4 chronic conditions Qualitative semi-structured interviews	Individual factors-decision-making <ul style="list-style-type: none"> Impact on self-image Preferences regarding medication use Barriers/facilitators

Study citation	Purpose	Sample & Design	Findings by Theme
			<ul style="list-style-type: none"> • Number of medications and regimen complexity • Treatment side effects
Townsend et al., 2006	To describe how people manage comorbid chronic illness in daily life.	Same sample and method as Townsend et al., 2003	Individual factors-decision-making <ul style="list-style-type: none"> • Impact on self-image • Sociocultural values