

Impact of Self-Management Interventions on Self-Efficacy of Middle-Aged and Older Adults with Chronic Diseases: A Systematic Review

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ABSTRACT

In 2030, 171 million people worldwide are expected to have at least one chronic condition, and nine out of every ten deaths in the USA are due to chronic conditions. Such reports reflect the need to look at the patients' self-manage chronic conditions. One of the principles for effective self-management and behavior change is self-efficacy. The purpose of this systematic review of the literature related to randomized clinical trials of patient self-efficacy is to examine the effectiveness of self-management interventions on self-efficacy of patients aged 45 or older. Only eight of over 240 studies reviewed only eight studies met inclusion criteria. Of those, four showed a significant relationship between participants' self-management of interventions and their self-efficacy ($p < 0.05$). The other four showed no significant relationship between these variables. Review results also found that male patients had better improvement levels in self-efficacy level when self-managing interventions. Additional databases and further research are recommended for future studies.

Keywords: chronic condition, scale, self-efficacy, self-management, middle aged adults, older adults

INTRODUCTION

Chronic diseases (e.g., heart disease, stroke, cancer, respiratory diseases, and diabetes mellitus) are the leading causes of death worldwide, representing 60% of all deaths according to the annual report of the World Health Organization (WHO) (World Health Organization, 2015). Seven of the top ten causes of deaths in 2010 were chronic conditions (Centers for Disease Control and Prevention, 2015). Freid, Bernstein, and Bush (2012) reported that between 2000 and 2010, the prevalence of chronic conditions among adults aged 45–64 or 65 and older has increased. Older adults are at high risk for developing chronic diseases. Around 60% of this age group may manage

more than one chronic disease by 2030 (Office of Disease Prevention and Health Promotion, 2015). These reports reflect the need to improve self-care of chronic conditions and interventions that support self-management processes.

Through this systematic review, I examined the impact of self-management interventions on self-efficacy of patients aged 45 or older. I focused my investigation on how self-management interventions impact self-efficacy in middle-aged and older adults with chronic conditions. The significance of chronic conditions among middle-aged and older adults is discussed followed by a thorough description of the search strategy, including inclusion and exclusion criteria. To conclude, I present an appraisal and synthesis of the included studies.

BACKGROUND AND SIGNIFICANCE

Self-management, self-management intervention, and self-efficacy need further explanation to help understand their importance in the management of chronic conditions among middle-aged and older adults. Self-management refers to a patient's ability to change one's behavior and have better control of his or her healthcare status (Jarvis, Skinner, Carey, & Davies, 2010). Self-management interventions are organized and administered by healthcare providers to help patients manage their chronic diseases better. These diseases are long-lasting illnesses that should be managed continuously because they cannot be cured (Detaille, Heerkens, Engels, van-der Gulden, & Dijk, 2013).

Self-efficacy is the patients' confidence in their ability to exert control over their own motivation and behavior. The Self-Efficacy for Managing Chronic Disease Scale is one example of how self-efficacy is assessed (Lorig, Chastian, Ung, Shoor, & Holman, 2001). This instrument has six items and is used to measure perceived self-efficacy and level of confidence in doing different activities. Patients' self-efficacy is the prerequisite of effective self-management and behavior change. It may also influence the adherence to treatment, thus playing a major role for better outcomes (Mark, Ikehara, Matsuura, Hara, & Dongmei, 2013).

The self-management process for chronic conditions is designed to produce a new pathway to better health outcomes. The effectiveness of individual care depends on the level of the patients' awareness of their own health status and the interventions they should perform (Williams et al., 2013). Patients' age is also important for ensuring understanding and ability to self-manage chronic diseases. Middle-aged (45-64 years) and older adults (>64 years) require additional

attention because they are more likely to have life-threatening diseases due to the expected decrease in physical activity (Andrews, Bartels, Xie, & Peacock, 2009).

The alarming rates of chronic conditions are at an increase worldwide. Death rates caused by chronic diseases have raised the need to intervene and assist patients' behavior in the self-management process. The WHO (2014) reported that almost nine out of every ten deaths in the United States (U.S.) were caused by chronic conditions. Self-management interventions also benefit countries in reducing the budget that is given to the hospitals services. The U.S. reported that almost 85% of the federal budget expended on healthcare, more than \$2 trillion, is spent for patients with chronic conditions (Anderson, 2010). The financial burden of chronic conditions may affect costs at the level of person, family, society and nation. Other societal impacts of ineffective disease self-management are decreases in labor productivity and increasing in job turnover rates (Detaille et al., 2013). Detaille, Heerkens, Engels, van-der Gulden, & Dijk (2013) reported that between 28% and 33% of adults in Europe and 44% in America have at least one chronic condition, and many of them experience job loss as a result.

Freid et al. (2012) reported that more than one in five middle-aged adults and almost half of older adults have more than one chronic condition . Williams et al. (2013) also stated that 77% of the people in Australia have a chronic disease. Almost 55% of them, aged 65 years or older, had five or more chronic conditions. The number of people with chronic conditions is increasing. By 2030, 171 million people around the world are estimated to have at least one chronic disease (Anderson, 2010). White, Wójcicki, and McAuley (2012) also suggested that further support should be offered to self-efficacy in middle-aged and older adults because of its potential impact on their physical activity. These reports reflect the importance of looking at the effect of self-management interventions on self-efficacy of middle-aged and older adults with chronic conditions.

METHOD

I performed a systematic search on effectiveness of self-management interventions on self-efficacy of middle-aged and older adults with chronic conditions. The electronic search was conducted using four databases: Medline, Cumulative Index of Nursing and Allied Health Literature (CINAHL), Cochrane library, and PsycInfo. The keywords used for the search process were nearly the same for each database: self-care, self-management, self-managed intervention, patient participation, self-efficacy, and chronic disease. The inclusion criteria for the studies were that

they should be: a) focused on middle-aged and older adults (age 45 or older); b) randomized controlled trials (RCT); c) written in the English language; and d) published between 2010 and 2015. Studies also had to employ reliable self-efficacy scales. Identifying patients' self-efficacy level may benefit researchers regarding hospital visit rates among patients with chronic conditions. This review focuses on RCTs due to their strong conclusions and lack of bias. Only recent studies published within the last five years were included to capture the most current information on self-management and efficacy among middle-aged and older adults. Studies were excluded if their focus also considered adults aged 18–43 and their design was qualitative or not RCT.

To provide a systematic review, I used the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) flow chart (Moher, Liberati, Tetzlaff, & Altman, 2009). This chart provides a thorough explanation for the number of studies included and reasons for exclusion. The search and reasons for exclusion are shown in Figure 1. As seen in Figure 1, the electronic search of the four databases identified 240 studies. Using Zotero citation management software, developed by Roy Rosenzweig at the Center for History and New Media (2015) I identified duplicates. The titles and abstracts of the remaining 166 articles were screened based on the inclusion and exclusion criteria. I then assessed the full-text of the resulting nine studies for eligibility, resulting in the exclusion of one study due to lack of information on the scale used for measuring self-efficacy. The remaining eight studies met the eligibility criteria for this review (Table 1, See Appendix). The results achieved from this systematic review are summarized below.

FINDINGS

The eight studies aimed to measure patients' self-efficacy toward their chronic conditions (Mueser et al., 2010; Richardson et al., 2010; Bearne et al., 2011; Dickstein et al., 2013; Mark et al., 2013; Williams et al., 2013; Bartels et al., 2014; Chow & Wong, 2014). Four of the studies showed a significant effect of the interventions on participants' self-efficacy ($p < .05$) (Mueser et al., 2010; Dickstein et al., 2013; Williams et al., 2013; Chow & Wong, 2014). The other four studies did not find a significant impact for the interventions on the self-efficacy level ($p > .05$) (Richardson et al., 2010; Bearne et al., 2011; Mark et al., 2013; Bartels et al., 2014). Mueser et al. (2010) also stated that male patients were better in self-efficacy ($p = .37$) compared with female patients ($p = .18$). The authors also reported that younger patients < 60 years showed better self-efficacy than > 60 years. Williams et al. (2013) pointed out that those patients aged 45–54 showed greater improvement in self-efficacy. In addition, Bartels et al. (2014) reported that

gender was ($p = .81$) and marital status was ($p = .67$). The same study also reported the significance of age in the results ($p = .45$). Other studies did not provide deeper results; instead, they used the space to explain participants' characteristics (Table 3, see appendix).

Quality Appraisal of Studies

The aim of quality appraisal in this review was to evaluate the strengths and weaknesses of the studies included. I used the Johns Hopkins Nursing Evidence-based Practice (JHNEBP) grading scale to measure the quality of different domains: generalizability of results, sufficiency of sample size, and effectiveness of literature review and conclusions (Newhouse, Dearholt, Poe, Pugh & White, 2007). Based on these domains, studies with high quality are labeled at *A Level*, studies with good quality are at *B Level*, and studies with low quality are at *C Level* (Table 3).

Consistency of the definitions and concepts. Six of the eight studies did not provide a clear definition for the term of *self-management*. Instead, they focused entirely on the interventions that were designed to improve self-management and show their effect on self-efficacy (Mueser et al., 2010; Richardson et al., 2010; Bearne, Walsh, Jessep, & Hurley, 2011; Dickstein et al., 2013; Mark et al., 2013; Williams et al., 2013). Only two studies reflected that self-management is a strategy used to help improve health outcomes for chronic medical conditions (Bartels et al., 2014; Chow & Wong, 2014). All studies used interventions that were suitable for the context of their studies. Three studies included the rehabilitation services for the interventions (Mueser et al., 2010; Richardson et al., 2010; Bearne et al., 2011). The other five studies focused generally on providing educational materials or teaching to their participants. For instance, Dickstein et al. (2013) investigated an integrated imagery practice program. Mark et al. (2013) used a registered respiratory therapist via Skype to look at patients' self-efficacy. In Australia, the "Moving On" program was considered by William et al., (2013). The Illness Management and Recovery program was also designed for patients with psychiatric issues to help for better self-management (Bartels et al., 2014). Home visit and call interventions were studied by Chow and Wong (2014) to monitor patients' self-efficacy enhancement (Table 1).

All eight studies defined chronic conditions as a kind of disease that cannot be cured. The disease type in some of studies was different. Mueser et al. (2010) and Bartels et al. (2014) focused mainly on serious mental illness, while Bearne et al. (2011) studied patients' conditions with chronic hip pain and disability. Mark et al. (2013) looked at Chronic Obstructive Pulmonary Disease (COPD), while Williams et al. (2013) studied arthritis disease. Two studies were

conducted to ascertain information on long-term illnesses (Richardson et al., 2010; Chow & Wong, 2014). Dickstein et al. (2013) focused only on patients' management of their stroke.

Self-efficacy in one of the studies was defined as the self-confidence and ability to perform different behavior to manage diseases' symptoms (Mueser et al., 2010). Self-efficacy was also defined by Bearne et al. (2011) as the degree of confidence in patients' ability to manage their hip pain and potential symptoms. Mark et al. (2013) stated that self-efficacy was related to the confidence in reducing diseases' symptoms to help patients do what they like or what they need easily. Five studies did not provide a clear definition for the self-efficacy concept (Richardson et al., 2010; Dickstein et al., 2013; William et al., 2013; Bartels et al., 2014; Chow & Wong, 2014). Those five studies focused more on the scales used to measure patients' self-confidence.

Operational concepts. Self-efficacy was measured using the Revised Self-Efficacy Scale for patients with schizophrenia (Mueser et al., 2010). The scale includes 57 statements to measure patients' social behavior and self-efficacy on a scale from 0–100, higher scores showing greater self-efficacy. Four studies used the Self-Efficacy for Managing Chronic Disease, which is a 6-item scale to measure patients' self-efficacy (Richardson et al., 2010; Mark et al., 2013; Williams et al., 2013; Bartels et al., 2014). Bearne et al. (2011) considered the Arthritis Self-Efficacy Scale to measure patients' influence in their hip pain, day-to-day activities, and symptoms, including a minimum score of 10 and maximum score of 100. The Falls-Efficacy Scale, Swedish version, was used by Dickstein et al., (2013). This scale measured fall-related self-efficacy with additional questions tailored for post-stroke subjects. Chow and Wong (2014) used the 6-item version of the Short-Form Chronic Disease Self-Efficacy, Chinese version (Table 1).

Self-management interventions may influence patients' behavior and lead to better outcomes. Designing interventions to improve chronic-condition management could be an effective strategy. Patients with chronic conditions seek better understanding of their illnesses to have an optimal level of self-efficacy. Because such diseases are not cured, patients' self-efficacy should be monitored frequently. The Self-Efficacy for Managing Chronic Disease scale was used in the majority of the studies; it may reflect its effectiveness for measuring self-efficacy.

Methodological Rigor

Study designs and sample sizes. This review includes only randomized controlled trials in each study (Mueser et al., 2010; Richardson et al., 2010; Bearne et al., 2011; Dickstein et al.,

2013; Mark et al., 2013; Williams et al., 2013; Bartels et al., 2014; Chow & Wong, 2014). The sample size and participants' characteristics are presented in Table 2 (see appendix).

Measurement. Consistency among the instruments was missing in some studies. Five studies reported the validity and reliability of the scale considered in each. Four of them used the same instrument (Richardson et al., 2010; Mark et al., 2013; Williams et al., 2013; Bartels et al., 2014). The other study, which was developed by Chow and Wong (2014), used a scale translated into Chinese. Three studies considered additional measures with self-efficacy scales (Mueser et al., 2010; Bearne et al., 2011; Dickstein et al., 2013).

Factors affecting internal and external validity. Patient withdrawal in four studies had an effect on the final findings (Bearne et al., 2011; Richardson et al., 2010; Mark et al., 2013; Williams et al., 2013). Withdrawal may also affect the pre-test and post-test results of those studies. The other four studies had results that were suitable for the sample size involved in each (Mueser et al., 2010; Dickstein et al., 2013; Bartels et al., 2014; Chow & Wong, 2014). Mueser et al. (2010) developed additional skills training and health management intervention to meet the rehabilitation needs of older people. This additional intervention was designed when an unanticipated concern occurred with older adults while the main intervention was in progress. The disparity in the number of men and women in all studies was another issue with generalizing the results. In addition, no changes for the dependent variable in each study were found. Threat of statistical regression was not identified in all studies. Random selection of participants was appropriate for each study. Each self-efficacy scale was also useful for the context of the study in which it was used. Some studies also considered additional measures with the self-efficacy scales they used. Finally, differences in the sample sizes among the eight studies may affect the generalizability of results for this review.

Overall Strengths and Weaknesses

Strengths. Five studies had a sufficient sample size (Mueser et al., 2010; Richardson et al., 2010; Bearne et al., 2011; Williams et al., 2013; Chow & Wong, 2014). In addition, all included studies used reliable scales that were suitable for the measuring self-efficacy (Mueser et al., 2010; Richardson et al., 2010; Bearne et al., 2011; Dickstein et al., 2013; Mark et al., 2013; Williams et al., 2013; Bartels et al., 2014; Chow & Wong, 2014). Two studies showed reasonably consistent recommendations for future studies based on their scientific evidence (Mueser et al., 2010; Williams et al., 2013). Four studies showed adequate control for the interventions being considered (Richardson et al., 2010; Mark et al., 2013; Bartels et al., 2014; Chow & Wong, 2014). Six studies

did not significantly differ by demographics (Mueser et al., 2010; Richardson et al., 2010; Bearne et al., 2011; Williams et al., 2013; Bartels et al., 2014; Chow & Wong, 2014). Two studies were graded at a high-quality level (Richardson et al., 2010; Chow & Wong, 2014). Three studies were graded at a good quality level (Mueser et al., 2010; Bearne et al., 2011; Williams et al., 2013).

Weaknesses. Three studies had an issue regarding the sample size that may lead to negative effects on the results (Dickstein et al., 2013; Mark et al., 2013; Bartels et al., 2014). Recommendations for future studies were not explained thoroughly in six studies (Richardson et al., 2010; Bearne et al., 2011; Dickstein et al., 2013; Mark et al., 2013; Bartels et al., 2014; Chow & Wong, 2014). Six studies also showed limited ability to generalize their results (Mueser et al., 2010; Richardson et al., 2010; Bearne et al., 2011; Dickstein et al., 2013; Williams et al., 2013; Chow & Wong, 2014). Two studies did not provide a thorough clarification for the effects of participants' demographics (Dickstein et al., 2013; Mark et al., 2013). Instruments used in the included studies were another issue. In addition, three of the studies were graded at a low-quality level (Dickstein et al., 2013; Mark et al., 2013; Bartels et al., 2014).

DISCUSSION

The results of this review suggest that further work is still needed to understand the relationship of self-management, self-management interventions, and self-efficacy on chronic disease management. Two of the studies reflected that self-efficacy is greater in patients younger than 60 years old. Another study also demonstrated greater improvement in self-efficacy with male patients. Only four studies demonstrated the positive impact of self-management interventions on self-efficacy. The other four studies did not have an impact for their interventions on enhancing patients' self-efficacy. The majority of the participants were married according to reports from four studies. However, lack of explanation of the significance of marital status for self-efficacy was noticed.

Two gaps were found in this review: Lack of results between genders and lack of information on older adults. Gender results are important because male patients may benefit better in social activities or physical training due to their physical strength (Mueser et al., 2010). Lack of knowledge on older patients was also found. The majority of studies did not provide enough information regarding the results on self-efficacy of older adults. Therefore, it is difficult to answer whether self-management interventions can enhance self-efficacy level. The existing research is

heterogeneous in the samples and interventions to determine whether self-management interventions can universally improve self-efficacy.

LIMITATIONS

Several limitations of this review should be noted. First, completing the sections of this review by one researcher is a big limitation of this review. Second, the review included different countries and cultures. The diversity of countries may diminish the generalizability of findings. Thus, the findings need to be interpreted with caution. Third, comparison between participants' characteristics was another limitation. Lack of similarity in participants' characteristics among all included studies may lower the evidence of the results for this review. Fourth, the short period of time for this review and limiting the search process to four databases mean that other relevant studies may have been missed. Some studies also have a small sample size, which may have limited power to identify important differences for this review.

RECOMMENDATIONS

Further research is needed to understand the relationship between self-management, self-management interventions, and self-efficacy in management of chronic diseases. An additional search of databases and expansion of the search to be greater than five years to answer the main question would be an interesting next step. There is a need also to design studies on intervention programs involving patients and their families. Future research should also evaluate the success of adapting such interventions for use with a broader range of populations. Furthermore, future studies should examine cost concerns, and new policies may also be required to guarantee that interventions can be useful for patients. In education, students should learn ways to encourage patients with chronic conditions to a better quality of life. Nurses also should be taught the significance of educational interventions to families and the impact on patients' self-efficacy levels. Healthcare settings should provide programs on primary prevention, behavior modification, and medication adherence, as areas needed for self-management and self-efficacy.

In conclusion, the impact of self-management interventions on self-efficacy of middle-aged and older adults with chronic diseases is still unknown. The findings did not provide a suitable answer to the question of this review. However, some studies reflected the possibility of having an impact for interventions on patients' self-efficacy. The findings also showed the need to investigate self-efficacy levels among male and female patients. Such steps may be effective when there is a comparison between the two genders regarding self-efficacy level. The effectiveness of remote

interventions on self-efficacy compared with face-to-face interventions needs further investigation.

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APPENDIX

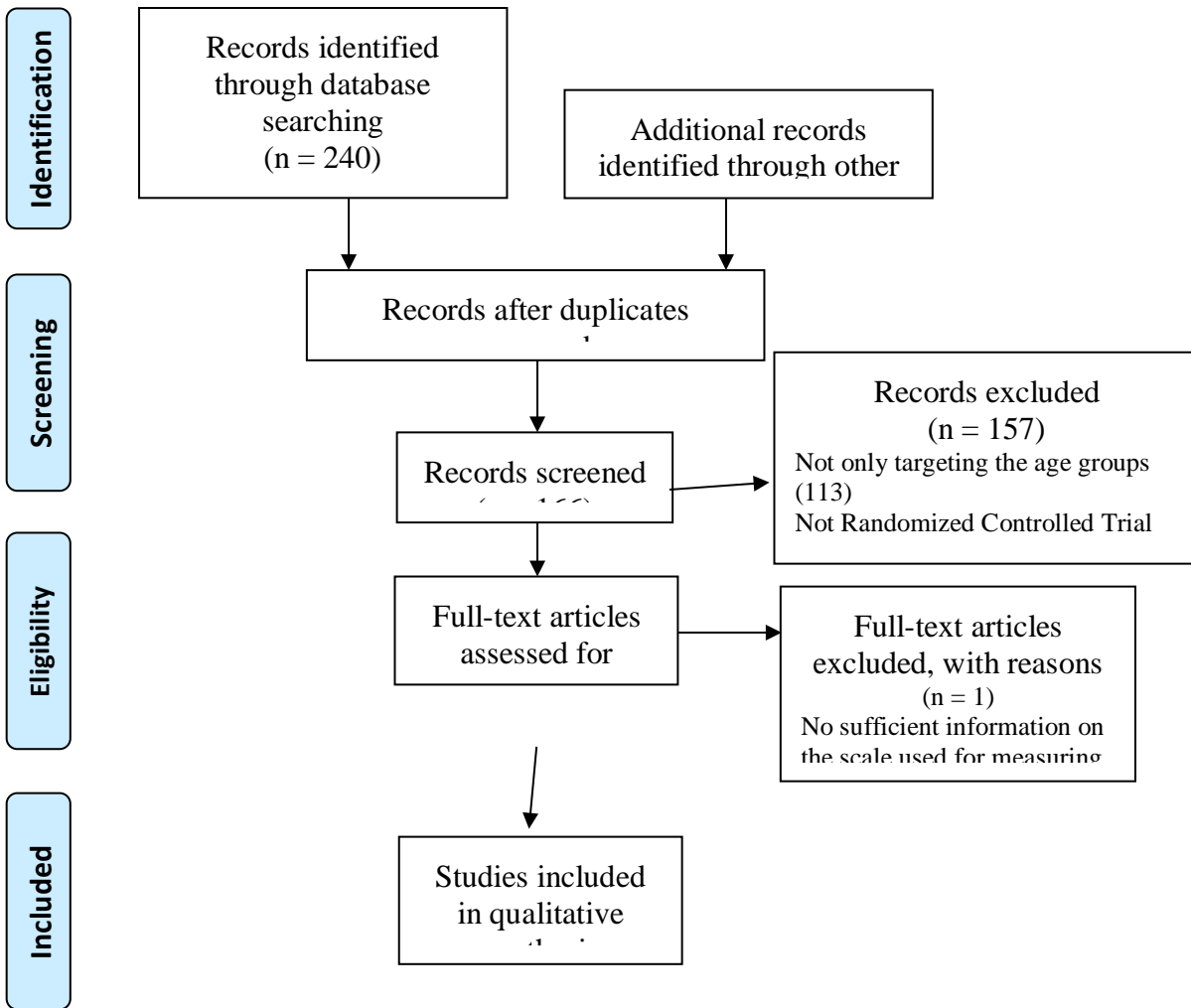


Figure 1. PRISMA flow diagram for included and excluded studies

Table 1
Components of Reviewed Articles

Citation	Purpose	Intervention	Measurement	Level of Evidence
Mueser et al (2010)	Randomized control trial to assess impacts of the Helping Older People Experience Success (HOPEs) on social skills and psychosocial functioning.	HOPEs intervention, (n=90), provides a social rehabilitation service and health management sessions over 2-years. "Weekly skills classes, twice monthly community practice trips, and monthly 1:1 meetings with a nurse (first year). Monthly skills classes, community practice trips, and meetings with a nurse "p. 6 (second year). Other group continues in their usual mental health services (n=93).	Several measurements were applied and Revised Self-Efficacy Scale (RSES) was used for the outcome, (examine improvement in self-efficacy of participants) (McDermott, 1995).	Level I and good quality B
Richards et al (2010)	Randomized control trial to identify "differences between patients who received a rehabilitation intervention in a primary care setting compared with patients who did not receive the intervention" (p 384).	The intervention delivery followed the rehabilitation service. The intervention group (n= 152, male=54, female= 98) focused on collaborative goal setting between the therapist and the patient. The physiotherapist and the occupational therapist provided the rehabilitation intervention. A monitoring process identified patients at risk for functional decline. If at risk, participants were given priority for intervention. The experimental group was given important information about rehabilitation and chronic conditions management within the workshop. The control group (n=151, male= 57 and female= 94) received no intervention so they stayed on their usual care.	Several measures were used, including the Self-Efficacy for Managing Chronic Disease 6-Item Scale to measure the outcome, (self-efficacy of participants towards their chronic conditions) (Long et al., 1996).	Level I and high quality A
Bearne et al (2011)	Randomized control trial to evaluate the feasibility of an exercise-based rehabilitation program to help decrease chronic hip pain and disability.	Participants in the control group (n=24, age 52-76 and 19 female) were asked to keep usual care. Participants randomized to the experimental rehabilitation program group (n=24, age 53-78 and 15 female) received a five-week exercise and self-management program, (ten 75-minute group	Several tools were used, including the Arthritis Self-Efficacy Scale. The scale examined the outcome, (participants' self-confidence with their	Level I and good quality B

Dickstein et al (2013)	Randomized control trial to examine the outcomes of an integrated motor imagery practice intervention to support the walking deficits and improve people self- efficacy who have post-stroke.	Phase 1 : Participants (n=12) were involved in the experimental group (integrated imagery practice) and (n= 11) to the control treatment. Phase 2. Participants who had received the control treatment received the integrated imagery practice. In a blinded style, two physical therapists evaluated the group treatment work.	chronic conditions) (Long et al., 1989).	Level I and low quality C
Mark et al (2013)	Randomized control trial to examine the feasibility of "Pursed-lips breathing" practice by applying interacting communication over a distance among different people; to examine the feasibility of Skype management intervention in adults with COPD; and to compare a structured PLB self-management intervention for improved self-efficacy to a control group.	The experimental group had (n=11) and the control group (n=12). The intervention was given during four weekly teaching sessions with a registered respiratory therapist via Skype. Face-to-face, one-hour sessions were offered at the University of Hawaii campus. Participants could learn about anatomy and physiology of the lungs, and 'Pursed-lips breathing.'	Falls- Efficacy Scale, Swedish version (FESS) was used for this study. The scale was considered for measuring the outcome, (patients' motivation toward their disease management) (Hellstrom, Lindmark & Fugl, 2002). Five different instruments, including the Stanford Chronic Disease Self-Efficacy Scale to measure the outcome, (patients' self-efficacy) (Long et al., 2001).	Level I and low quality C
Williams et al (2013)	Randomized control trial to assess the 'Moving On' program, which is a generic self-management program for people who suffer chronic conditions. The program was developed by Arthritis NSW in Australia to identify participants' requirements for behavior change and understand helpful	The Moving On experimental group (n=123) had seven modules. One module was offered in 3 hours/ week for seven weeks. This group was provided a work-book and reading materials and encouraged to have goals for each module. After 4-month follow-up (n=93), participants were asked to write a plan to continue self-management of their diseases. The control group (n= 124 at baseline) was focusing on giving light physical activity by a fitness trainer (1-hour session/week	A number of measures were used, including the Self-Efficacy for Managing Chronic Disease 6-Item Scale. The tool was helpful for examining the outcome, (patients' motivation and confidence with their chronic conditions	Level I and good quality B

<p>information for self-management.</p>	<p>for seven weeks. After 4 months follow-up, the number was 96.</p>	<p>management) (Lorig et al., 1996).</p>
<p>Bartels et al (2014)</p>	<p>Randomized control trial to assess and improve the integrated "Illness Management and Recovery (I-IMR)", an intervention that is used with IMR for psychiatric issues to the self-care of chronic diseases.</p>	<p>One of the instruments was the Stanford Chronic Disease Self-Efficacy Scale. This tool was considered to measure the outcome, (self-efficacy of participants) (Lorig et al., 1996).</p>
<p>Chow & Wong (2014)</p>	<p>Randomized control trial to evaluate effects of a "nurse-led case management program, to help study groups have better quality of life; to help the study groups demonstrate better self-efficacy in disease management than the control group; and to help the study groups experienced better self-rated health than the control group.</p>	<p>Several measurements were used, including the six-item Chinese version of the Short-Form Chronic Disease Self-efficacy scales. (Chow & Wong, 2013).</p>

Table 2
Characteristics of Study Participants

Citation	N	Criteria	Characteristic
Mueser et al (2010)	183	Diagnosed by severe mental illness or depression.	Age (50 years or older), gender, ethnicity (white/ not white), Latino (were less likely to be Latino), marital status (more likely to have been married), education, residential, and diagnosis.
Richardson et al (2010)	303	At least one of the chronic conditions of interest, at least four visits to a physician in the last year, did not have chronic mental disorder, and were not residing in a long-term care center.	Age (44 years or older, mean=38), gender (female and male), education (elementary- university), year income (below \$ 20,000 and over \$ 50,000), marital status (married, separated, widowed), accommodation (house, apartment, senior's home), risk assessment (at risk, not at risk) and help available from household member (yes, no, no need).
Bearne et al (2011)	48	A clinical diagnosis of hip osteoarthritis (OA)	Gender, age (50 years or older), height (1.70 for intervention group and 1.65 for control group), and weight 77.5 for intervention 74.1 for usual group), BMI and duration of hip pain.
Dickstein et al (2013)	23	Recruited from the registry of Flieman Geriatric Rehabilitation Hospital	Age (60-80, mean 72_6.9), gender (women/ men=7/16), weeks from stroke (76.5_46), body side affected, number of insults and nature of stroke.
Mark et al (2013)	24	Diagnosis of COPD, and used "Medical Research Council Breathlessness Scale" to evaluate "Shortness of Breath (SOB)" scoring 2 or greater in the scale.	Gender female (62%) and White (58%), race, age (45 and older), had a diagnosis of COPD, and used "Medical Research Council Breathlessness Scale" to evaluate "Shortness of Breath (SOB)" scoring 2 or greater in the scale
Williams et al (2013)	247	Had chronic disease diagnosed, good knowledge of the care of his/her disease, spoke and understood English, agreed to session attendance requirements, and able to perform some physical activity	Gender (65.1% female), age (55-74 years (78.2%), English speaker at home (86.7%), Country of birth (56.0% born in Australia), accommodation type (82.4% in their home), employment status (76.1% employed or retired) and socio-economic indexes for areas (67.5%).

Bartels et al (2014)	71	Middle-aged and older adults, visited a mental health center, diagnosed by a physician with chronic disease, used psychopharmacological medications regularly.	Gender (39 female and 32 male), race (69 white and 2 nonwhite), marital status (17 never married, 39 currently married and 15 previously married), living status (39 independent and 32 supervised), education (25 less than high school, 26 high school and 19 > high school).
Chow & Wong (2014)	281	Older patients were recruited during their hospital admission.	Gender (female 52.5% and male 47.5%), age (mean age was 76.5), marital status (59.8% married), education attainment (30.2 no education, 45.6% for primary education, 16.4 for secondary and 7.8 for tertiary), occupation (96.1 not working), and number of co-morbid disease.

Table 3
Outcome and Assessment of Reviewed Articles

Citation	Findings	Conclusion	Strengths	Limitations
Mueser et al (2010)	The analyses of time effects indicated significant improvements in self-efficacy, $F(2, 293) = 5.26, p = .0057$. Males demonstrated greater improvement. Younger < 60 showed better self-efficacy than >60.	Participation in the HOPEs program had a better improvement in self-efficacy, social skill, and community functioning compared to usual care in patients with severe mental illness.	<ul style="list-style-type: none"> - Sufficient sample size. - Use of a reliable scale. - No significant difference between group by demographics. - Reasonably consistent recommendation for future studies 	<ul style="list-style-type: none"> - Some control for groups - Limited ability to generalize - Few racial/ethnic groups included.
Richardson et al (2010)	Self-efficacy scores in time 1: mean was 76.64 for intervention group and 77.43 for control group. In time 3: mean was 79.7 and 79.5 for control group. P-value was 0.47. No significant difference was found between genders or ages in the self-efficacy.	Changes related to self-satisfaction, self-efficacy, and health care services were identified. Further work is still needed to identify which group has a positive response to rehabilitation and self-management program.	<ul style="list-style-type: none"> - Sufficient sample size. - Valid instruments used. - Good tests used. - Adequate control for the intervention. - No significant differences between based on demographic variables. 	<ul style="list-style-type: none"> - 13% of intervention and 9% of control did not complete final assessments - Limited ability to generalize - Lack of information on the self-efficacy scale.
Bearne et al (2011)	No between group differences were found. Self-efficacy scores were not significant ($p=0.5$ in 6 weeks and $p=0.8$ in 6 months). No significant difference was noted between genders and age in the self-efficacy.	The rehabilitation program is tolerable, and the adaptations are important for designing a large randomized controlled trial. Future study should evaluate the efficacy and cost-effectiveness of this new program.	<ul style="list-style-type: none"> - Sufficient sample. - Consistent results. - No differences in participant characteristics. - Reliable scale. - Good conclusion and suggestions for future studies. 	<ul style="list-style-type: none"> - Unequal participation by gender. - Results are not generalized only to other chronic issues. - Limitation in patients' characteristic (diagnosis of hip pain).

<p>Dickstein et al (2013)</p>	<p>The FESS scores at post-intervention increased significantly compared to the pre-intervention assessment ($P=0.03$), showing an increase in fall-related self-efficacy. Scores of the participants increased after having the experimental intervention. No clear information on significance between genders and age.</p>	<p>Integrated motor imagery practice was effective for home walking and had a positive effect on fall-related self-efficacy.</p>	<p>- Good details for power size based on the sample and effect sizes. - A reliable scale - Appropriate explanation for the search - Reasonably consistent result.</p>	<p>- Small sample size. - Short study time. - Limited ability to generalize - Future work requires further explanation. - No chance of detecting the main effect. - No clear differences by participants' traits.</p>
<p>Mark et al (2013)</p>	<p>Men had significantly higher scores than women ($P = .027$). Whites had significant higher scores than Asian ($P = .04$) and other ethnic groups ($P = .045$). The intervention had no difference on self-efficacy of both groups ($p = .12$).</p>	<p>Additional support is still needed. Technology is helpful for telecommunication. Using technology for self-care of chronic diseases is effective. Further support to patients is required for raising level of confidence in self-care.</p>	<p>- Adequate control was found in this study. - Self-efficacy scale has an internal consistency reliability. - Good search method.</p>	<p>- Insufficient sample size. - Sampling was difficult in exclusion criteria. - Difficult to generalize. - No power analysis. - No recommendation for future studies. - Issues of potential bias related to race. - Controlled for, but unclear, group differences in baseline measures.</p>

Williams et al (2013)	55 people withdrew (44.7%): 24 (19.5%) withdrew from the study and 31 (25.2%) withdrew from the intervention but remained in the study and completed the follow-up survey. There was an increase in self-efficacy scores from baseline to follow-up in the intervention program attendees ($p=0.028$). No significant difference between gender. Those aged 45–54 were better in self-efficacy.	The Move On program provided positive trends in self-efficacy and behavior change. Further research is required to know the effect and cost of the Move On program, over a longer period of time.	<ul style="list-style-type: none"> - Sufficient sample size. - Consistent recommendation based on the results. - Reasonable search method. - Reliable scale used. - Reasonable results based on the current sample size. - No significant differences between participants in both groups related to the characteristics. - Fairly definitive conclusions. 	<ul style="list-style-type: none"> - High withdraws because of low control. - Limited allocation of participants. - Difficult to generalize.
Bartels et al (2014)	Self-efficacy scores changed in the three different follow-up sessions. There was no significant difference in I-IMR and self-efficacy ($p=.11$). No clear information was noted for the difference between gender and age in self-efficacy.	Providing integrated training and continuous support for self-care of psychiatric and general medical illness can be effective. Further investigation is required for self-efficacy on patients with psychiatric illness.	<ul style="list-style-type: none"> - Results were reasonable - Adequate control for both groups and suitable data analysis used. - Good conclusion with potential impact on agencies. - Self-efficacy scale was reliable for the sample because it was less burdensome for them. - Participants assigned to both groups did not differ significantly on demographics. 	<ul style="list-style-type: none"> - Low sample size (low power). - The results need further work to be generalizable. - Recommendations for future studies were not clear. - Difficult to have reliability based on the sample size.
Chow & Wong (2014)	Results identified significant difference ($p=0.001$). Home visit and call had higher significant in self-efficacy. No clear information was noted for the difference between genders and ages in self-efficacy.	There were correlations between chronic disease and self-efficacy, hospital readmission, and quality of life.	<ul style="list-style-type: none"> - Consistent results with sufficient sample size. - Adequate control for all groups. - Validity and reliability were ensured for the scale. - Reasonably thorough and appropriate search. - Significant difference between groups across the three points. 	<ul style="list-style-type: none"> - Difficult to generalize the results - single hospital. - Power size was good but would be improved by increasing the sample size from different hospitals.

