

CHRONIC DISEASE SELF-MANAGEMENT SUPPORT IN RURAL AREAS:
AN INTEGRATIVE REVIEW

An Integrative Review

Submitted to the

Faculty of Liberty University

In partial fulfillment of

The requirements for the degree

Of Doctor of Nursing Practice

By

Karla A Callahan

Liberty University

Lynchburg, VA

July 12, 2021

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ABSTRACT

Millions of Americans live with chronic health conditions which require careful attention and specific actions for optimal management. Chronic Disease Self-Management Education (CDSME) has been effectively utilized to improve health outcomes and quality of life for individuals with chronic disease, enhancing knowledge and self-efficacy. Traditional CDSME programs are less available for rural residents. An examination of successful CDSME programs highlights common interventions that yield success and may be utilized in a variety of settings. Self-management is more complex, but also more essential, for individuals with more than one chronic condition. Clinicians can provide individualized support for appropriate self-management techniques, thereby enhancing self-efficacy and quality of life. This Integrative Review will examine the literature to identify effective strategies to provide self-management support for adults in rural communities who live with one or more chronic conditions.

Keywords: Chronic disease self-management support interventions, quality of life, self-efficacy, rural health, self-management support interventions

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List of Tables

Table 1: Project Timeline.....p. 43

Table 2: Literature Review Matrix.....p. 44

Table 3: Thematic Analysis Table.....p. 52

List of Abbreviations

American Association of Colleges of Nursing (AACN)

American Psychology Association (APA)

Arthritis Self-Management Program (ASMP)

Centers for Disease Control and Prevention (CDC)

Chronic Disease Self-Management (CDSM)

Chronic Disease Self-Management Education (CDSME)

Chronic Disease Self-Management Program (CDSMP)

Clinical COPD Questionnaire (CCQ)

Chronic Obstructive Pulmonary Disease (COPD)

Diabetes Self-Management Program (DSMP)

Doctor of Nursing Practice (DNP)

Institutional Review Board (IRB)

Information Technology (IT)

Quality of Life (QOL)

Table of Contents

Acknowledgments.....	4
List of Tables	5
List of Abbreviations	6
Chronic Disease Self-Management Support in Rural Areas.....	9
Section One: Formulating the Review Question	9
Defining Concepts and Variables	10
Rationale for Conducting the Review.....	11
Purpose Statement.....	13
Clinical Review Questions.....	14
Formation of Inclusion and Exclusion Criteria.....	14
Conceptual Framework.....	15
Section Two: Comprehensive and Systematic Search.....	15
Search Organization and Reporting Strategies	15
Section Three: Managing the Collected Data	16
Quality Appraisal	16
Data Analysis and Synthesis.....	17
Section Four: Methodology	17
Problem Identification	17
Literature Review.....	18
Data Analysis and Synthesis.....	21
Frequently Used Self-Management Support Strategies	22
Traditional Chronic Disease Self-Management Education.....	22
Computer/ Mobile Apps	23
Support Groups	24
Family-centered care.....	25
Data Analysis	25
Conclusion Drawing and Verification	26
Ethical Considerations	27
Timeline	27

Section Five: Quality Appraisal.....	27
Sources of Bias	27
Appraisal Tools.....	28
Critical Appraisal and Applicability of Results	28
Synthesis	28
Feasibility.....	29
Acceptability.....	29
Effectiveness	30
Summary of Evidence.....	30
Section Six: Discussion and Conclusions.....	31
Implications for Practice.....	31
Individualized support	31
Prioritization of topics.....	32
Family support	32
Offer resources.....	32
Review symptoms and progress.....	33
Limitations	33
Dissemination	33
Conclusion	34
References.....	35
Appendix A: Project Timeline.....	43
Appendix B: Literature Review Matrix.....	44
Appendix C: Thematic Analysis	52
Appendix D: IRB Approval Letter.....	55
Appendix E: CITI Training Certificate.....	56
Appendix F: PRISMA Flow Diagram.....	57

Chronic Disease Self-Management Support in Rural Areas

Six out of 10 American adults suffer from at least one chronic disease, and four of 10 have two or more chronic diseases (CDC, 2020). For many of these individuals, special education regarding their illness and how to manage symptoms is an important part of living well and minimizing adverse consequences of the disease. The need for clinicians to support them in self-management activities continues to grow. For the purposes of this integrative review, literature which addresses self-management of chronic disease will be examined to find strategies which enhance self-efficacy, limit consequences of illness, and improve health. Key elements of successful CDSME programs will be investigated to reveal approaches the rural clinician may utilize to empower patients as they navigate life with one or more chronic conditions.

Section One: Formulating the Review Question

Chronic disease self-management support has been utilized effectively for a variety of health concerns and patient populations. Self-management education programs for specific conditions have been utilized for decades, beginning with the Arthritis Self-Management Program (ASMP) developed by Lorig. The program was delivered over six weekly two-hour sessions and focused on improving self-efficacy and ability to manage symptoms of arthritis. Topics addressed in ASMP include appropriate exercise, appropriate use of medication, effective communication with health professionals, interaction with family, pain management techniques, nutrition, and evaluating new treatments (Allegrante et al., 2019). Disease-specific programs for asthma, cardiovascular disease, and diabetes have been utilized effectively, and have shown measurable results for improved health behaviors, self-efficacy, and patient outcomes as well as a decrease in cost of care and health resource utilization. The Chronic Disease Self-Management

Program (CDSMP), which is based on the original ASMP, was developed to assist people with a wide range of chronic conditions, and has been implemented in diverse population groups while continuing to produce improvements in quality of life and health outcomes. Participation in CDSMP is associated with improved exercise capacity, cognitive symptom management, communication with physicians, and measures of health status (Allegrante et al., 2019). The success of the CDSMP illustrates the impact of self-management support for patients who are dealing with more than one chronic condition. Although many self-management studies include patients with co-morbidities, there are few studies which exclusively address the needs of patients with multiple chronic conditions.

Defining Concepts and Variables

Chronic disease will be defined as any persistent limitation of health which requires medical management and from which the individual is not expected to spontaneously recover. Common chronic diseases include, but are not limited to diabetes, hypertension, heart failure, chronic obstructive pulmonary disease (COPD), asthma, depression, and anxiety. Control of symptoms may be dependent upon medication use, healthy lifestyle choices, avoidance of triggers, use of adaptive devices, or some combination of these.

Self-management includes intentional activities an individual performs to manage or control their health condition, and includes both critical thinking and reflection (Larsen et al., 2017). This may include such activities as exercise, measuring blood glucose, blood pressure, or peak flow. It may involve more complex activities such as computing and administering a correct insulin dose based on blood glucose, type of food consumed, and anticipated activity level. Self-management activities are inherently individualized to meet the needs of a particular person, though the broader principles may apply to anyone with a chronic condition.

Self-efficacy for health behavior reflects the patient belief that particular behaviors will lead to improved outcomes, and the ability of the patient to engage in such behaviors (Bandura, 1977).

As guided by the United States Census Bureau, rural includes all population, housing, and territory not included within an urban area; urbanized areas and urban clusters comprise groups of at least 2,500 residents. In the 2010 census, 19.3% of the population and 95% of land area was regarded as rural (Health Resources & Services Administration, 2020).

Rationale for Conducting the Review

Over the past couple of decades, the patient role within the United States health care system has emerged as more engaged and central. Enhanced treatment modalities for chronic conditions have led to improved prognosis for many chronic conditions, but demand some degree of self-management. Three core principles of chronic disease self-management education include: 1) people with different diseases have similar self-management problems and self-management tasks, 2) people can learn to accept responsibility for day to day management of their chronic disease, and 3) confident and knowledgeable patients who practice self-management have better health and use fewer resources (Cutler, 2018). As more patients actively engage in self-management, clinicians must develop effective ways to support their efforts and enhance self-efficacy. Self-efficacy, as described by Bandura, is dependent upon two beliefs—the belief that a change in behavior will result in a positive result, and the belief that the individual is capable of making the needed change. A deficit in either of these will cause a failure to elicit behavioral change (Bandura, 1977), such as the adoption of self-care management techniques. Greater self-efficacy is associated with improved outcomes for patients

facing multiple conditions (Peters et al., 2019). Clinicians serving patients in rural areas must support their patients as they age and learn to live well even with chronic disease.

Formal self-management educational programs have demonstrated effectiveness, but are less accessible for residents of rural areas. Rural communities have higher rates of almost every chronic condition, lower life expectancy, and lower self-rated physical and mental health, but higher rates of smoking, poor diet, and physical inactivity (Jensen et al., 2020). Health disparities between urban and rural communities continue to grow. Increasing the number of rural residents who actively self-manage chronic conditions may be helpful in improving health for individuals and in reducing these disparities.

Effective self-management yields an impact in both condition outcomes and individual outcomes. Measurable condition outcomes vary by disease, but may include such measures as hemoglobin A1c for those with diabetes; functional mobility for those with arthritis; or peak flow readings for those with asthma. Reduced use of emergency services and lower rates of hospitalization amongst those with chronic conditions who are optimally self-managing their illness demonstrates its effectiveness (Larsen et al., 2017). Individual outcomes including higher self-efficacy, quality of life, and ability to participate in family activities are examples of subjective experiences that exemplify the impact of successful self-management strategies.

Optimizing self-management support may be one key to mitigating the health disparities between urban and rural inhabitants. Therefore, this integrative review will evaluate literature addressing chronic disease self-management support and its impact on patient outcomes, self-efficacy, and quality of life. Special attention will be given to interventions the clinician serving rural residents can employ to support the individual as they learn to manage their chronic conditions.

Problem Statement

Chronic disease self-management has proven to be very effective in enhancing overall health and quality of life for those navigating the management of one or more conditions. However, self-management education is not limited to a specific point in time or participation in a particular program. Patients require ongoing support in appropriate self-management to sustain healthy behaviors as their condition progresses. Development of a relationship with a primary care giver who can guide a patient as they continue to cope with a chronic condition is essential to optimal health. Existing programs have demonstrated effectiveness in positively impacting health outcomes for participants, but such programs are less accessible for residents of rural areas. An evaluation of existing self-management education programs may allow the rural clinician to develop an approach which implements selected elements of these programs and is tailored to the needs of each patient.

Purpose Statement

For this review, the specific focus of interest is on determining how an advanced practice nurse can best support patients who are participating in self-management of one or more chronic conditions. Factors impacting provision of self-management support for residents in rural areas will be examined. Care must be taken to assure that self-management support is provided to those who will most benefit from it, and that the provision of such support does not inadvertently widen health disparities between urban and rural populations. Chronic disease self-management has been widely studied, and continues to show promising results. Patients require assistance with managing their conditions, but there is no universal support strategy that clinicians can employ which is helpful for all of their patients. This integrative review will identify specific support strategies which may be employed by clinicians serving in rural areas.

Clinical Review Questions

Two questions will be addressed in this integrative review. What specific interventions can the nurse practitioner employ to support patients as they engage in self-management of chronic diseases? What approach to care can a nurse practitioner use to engage patients in self-management of chronic conditions? Existing literature will be examined to determine common support strategies, their effectiveness, and any recommended approaches to care for individuals who are practicing self-management of their chronic conditions.

Formation of Inclusion and Exclusion Criteria

Chronic condition self-management has been well studied and described in the literature, with an ever-expanding body of evidence supporting its effectiveness. While the usefulness of self-management education for several conditions has been validated, less information regarding its use in patients with multiple chronic conditions is available. For this integrative review, both qualitative and quantitative studies of self-management support will be examined. A variety of self-management support strategies will be explored, rather than limiting to interventions directed at specific conditions. Current literature published in English from January 2015 through December 2020 is included. Although most published data focus on adult populations, studies which address pediatric and family support in self-management are not excluded.

Articles addressing specific self-management support strategies, self-efficacy or quality of life, multiple chronic conditions, and the rural environment are included. The final selection of articles to review includes those describing a variety of support strategies. Articles are categorized by type of support strategies described and whether patient management approach recommendations are included.

Conceptual Framework

The conceptual framework guiding the integrative review is the process described by Cooper (2001), and summarized by Whittmore and Knafl (2005). This process begins with identification of a problem and comprehensive search of published literature which addresses the problem. The processes of data evaluation and data analysis allow the researcher to ascertain what is currently known and to find any gaps which require additional investigation. Finally, an integrative synthesis is developed, presented, and disseminated. Toronto and Remington (2020) provide additional support for the researcher as the concepts of interest are explored, especially in the steps of data evaluation and data analysis. This integrative review will systemically evaluate a wide variety of sources to draw conclusions regarding which self-management support strategies may be most useful for a clinician providing care to rural patients with one or more chronic conditions.

Section Two: Comprehensive and Systematic Search

Search Organization and Reporting Strategies

Current literature published in English from January 2015 through December 2020 was identified using EBSCO to search four databases: CINAHL Plus, MEDLINE, Academic Search Ultimate (ASU) and Psychology and Behavioral Sciences Collection (PBSC). For the search term “chronic disease self-management”, a total of 1297 articles were found: 599 from MEDLINE, 408 from CINAHL, 313 from ASU, and 21 from PBSC. A series of modifiers was applied with the Boolean AND operator. For the search of “chronic disease self-management” AND “quality of life”, 300 articles were found. For the search of “chronic disease self-management” AND “support”, a total of 589 articles were summoned. Using the search terms “chronic disease self-management” AND “health outcomes” yielded 254 articles. Finally, a

search with the terms “chronic disease self-management” and “rural” provided 78 articles; when duplicates were removed 44 unique articles were examined.

An examination of titles and abstracts led to the exclusion of 10 articles which were either missed on the automated duplication screen, did not have a primary focus on self-management, or were not available in English. Thirty-four full-text articles were reviewed, and seven were excluded because they did not discuss self-management support interventions. One was excluded because it described a study which had not yet been completed. A final selection of 26 articles were evaluated for this integrative review. See the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow diagram in Appendix E for a visual representation of the final selection process.

Section Three: Managing the Collected Data

Following identification of articles through the previously described search strategy, each article was evaluated by reading the article title and abstract. Inclusion and exclusion criteria determined which articles to further evaluate. Each article which met the criteria was read in full to determine whether to exclude or to retain. Retained articles were evaluated for emergence of similar themes, rated by Melnyk’s level of evidence, and placed within a matrix summarizing key aspects of the article (Appendix B).

Quality Appraisal

Each article was appraised using the Rapid Critical Appraisal Checklists developed by Melnyk and Fineout-Overholt (2015). Use of these checklists to provide a systematic appraisal of each article’s strengths and weaknesses allowed the researcher to identify potential sources of bias and to differentiate between stronger and weaker study designs. Articles were appraised in view of the research questions, “were specific useful self-management strategies described?” and

“was a patient management approach described?” No articles were excluded on the basis of poor academic rigor, but the analysis and ranking of the studies supported the researcher by allowing greater emphasis on stronger studies.

Systematic thematic analysis, as described by Braun and Clark (2006), guided the researcher through the process of identifying common themes and how these could be used to answer the guiding research questions. A thematic elements table was developed which describes support strategies addressed in each article, and recommended approaches where these were included (Appendix C). Phases of thematic analysis include becoming familiar with the research, initial coding, searching for themes, reviewing themes, defining themes, and producing the report. Studies were grouped by type of self-management strategies described, effectiveness of the strategies in improving measurable patient outcomes, and whether they included recommendations on how the clinician should approach self-management education activities.

Data Analysis and Synthesis

Common themes emerged as the articles were evaluated. Support strategies were divided into four categories, with some articles describing strategies in more than one category or strategies that modify a more traditional category. Additional common themes included the effectiveness of chronic disease self-management, the need to individualize support strategy used, and the need to include families and friends in educational efforts.

Section Four: Methodology

Problem Identification

Over the past few decades, the American health care system has encouraged a more active and involved role for the patient. Many patients have accepted greater responsibility for managing their own chronic conditions and have benefitted from better outcomes than patients

who are managed in a more traditional, paternalistic fashion. However, not all patients are able or willing to engage actively in self-management activities. Identification and proliferation of the most effective methods to support self-management will benefit patients with chronic conditions by improving self-efficacy, health behaviors, health status, and quality of life (Allegrante et al., 2019). Clinicians will benefit from having a structured and systematic approach they can utilize to support patients who are actively engaging in self-management, and to encourage more active participation for those patients who are not.

Literature Review

Published studies of self-management programs provide an overview of helpful interventions and keys to improving quality of life while reducing health care costs. The most common published reports provide descriptions of programs which have been developed and implemented for particular patient populations. Gagné (2020), Jonsdottir (2015), Liou (2019), Park (2020), Patel (2016) and Coultas (2018) each describe specific programs which address COPD self-management and their favorable impact on participants. Gagné (2020) reported significant improvements in quality of life, health-directed behaviors, and skill acquisition, but no difference in health care utilization between participants and the control group. Jonsdottir (2015) provided support for patients with COPD and their families; participants in both arms of the study reported that participation was useful and important. Although there were no differences seen in quality of life, anxiety or depression, physical activity level, smoking status, or number of exacerbations, those in the treatment group reported that the disease was perceived as less intrusive than for those in the control group. Liou (2019) studied patients for three months following an acute inpatient hospitalization for COPD exacerbation; those who participated in CDSME reported increased self-efficacy, improved Clinical COPD Questionnaire (CCQ) scores,

and less dyspnea than those who received usual care. Park (2020) examined the effect of using a smartphone-based app to provide self-management support for patients with COPD. Although both the experimental group and the control group received a significant level of support, those who recorded their activities using the mobile app had significantly improved self-care behaviors from baseline, including longer distance on 6-minute walk, increase in total activity, improved self-care behavior, and better self-efficacy for maintaining exercise. Patel (2016) reported on an enhanced self-management model which included both use of an electronic symptom diary and frequent nurse visits; users of the electronic diary reported psychological benefits and fewer hospitalizations. One significant finding from this study was the reported importance of the support provided through scheduled face-to-face nurse visits.

Coultas (2018) reported on a randomized controlled trial where outpatients with stable COPD were either given usual care or assigned to a treatment group which included an additional 20 weeks of follow-up telephone support. All participants completed a standard 6 week CDSME program. At 18 months, 73.6% of the treatment group versus 57.8% of the control group reported being persistently active. Respiratory health care utilization was lower in the intervention group only for those with the most severe illness.

Odgers-Jewell (2015) reported on perceptions of facilitators of group CDSME programs. Facilitators rated the most important factors in program effectiveness as group interactions, multidisciplinary teams, non-didactic style of delivery, and use of practical activities. Most facilitators were not explicitly trained in CDSME instruction, and were unsure of the evidence base for the programs. Sangrar (2019) reviewed hybrid programs using both face-to-face and computer-based instruction for CDSME and found that some aspects of self-management support could be better provided face-to-face, while other aspects are more amenable to

technological support. Cutler (2018) published a systematic review of RCTs and investigative studies addressing CDSME. Of the ten studies reviewed, five were primarily for diabetes, two were generic, two were weight loss related, and two focused on minority groups. Overall, positive impacts were seen for participants, including improved glycemic control, and improved self-efficacy in the areas of speaking with provider, exercise, and diet.

Several qualitative studies which examined factors affecting participation in self-management education were identified. These are especially helpful as they may signify particular patient characteristics that clinicians may identify in their own patients. Anderson (2017) provided an 18 month follow-up of patients who were hospitalized with an acute COPD exacerbation and who were discharged with self-management support. For these patients, the primary concern at time of hospital discharge was regaining control. Participants continued to struggle with staying motivated to comply with recommendations, remaining confident, and asking for help. Brady (2017) provided a meta-analysis of 34 ASMP and CDSMP implementation factors and found, counterintuitively, that programs with lay persons (rather than professionals) as leaders and those that did not meet all fidelity factors were actually more successful. This reinforces that internal motivation of participants is of paramount importance to any program's success. Horrell (2017) demonstrated that middle-aged adults represent only a small portion of CDSME participants, and that these participants were more likely to identify as Hispanic, African American, or American Indian. Middle-aged participants reported two to three chronic conditions and those from the poorest socioeconomic sectors were the most likely to complete all classes in a program once they enrolled.

Fewer studies addressing geographic features pertaining to CDSM programs were available. Smith (2019) examined geographic disparities associated with travel to medical

appointments and attendance at self-management programs among Texas residents. Those patients with multiple conditions and those who already spent more time traveling to medical appointments were more likely to participate in formal CDSM programs. Bobbitt (2019) also looked at factors associated with CDSM program participants, and found that members residing in rural counties were more likely to complete the full program of 6 classes, compared to an average of 4.2 classes. Participants were more likely to complete the diabetes self-management program, compared to a generic self-management program.

Common to all CDSM interventions is the desire to improve quality of life and health status for patients with a chronic condition. Nurse clinicians are optimally situated to assist patients as they engage in self-management behaviors. Because most chronic conditions are affected by lifestyle choices, encouraging self-management behaviors represents an opportunity for nurse clinicians to positively impact the health of those they care for. A clinical approach which encourages self-management may be effective in all areas of the prevention spectrum, from primary prevention by establishing healthy patterns, through secondary and tertiary prevention by providing strategies to manage illness and prevent complications (Grady et al., 2014).

Data Analysis and Synthesis

This exploration of literature regarding CDSME, its impact, and types of support clinicians can provide for patients practicing self-management has uncovered several useful themes. Chronic disease self-management has the potential to improve patient self-efficacy, health behaviors, health status, and quality of life (Allegrante et al., 2020). Although patients have assumed a more active role in today's health care system, they still depend upon health professionals to guide them as they learn to live with a chronic condition. Clinicians must

individualize the support given to each patient in order to best support their efforts at self-management. The development of a healthy patient-provider relationship is foundational to providing the appropriate level of support as the chronic disease progresses. Allowing the patient to assume responsibility for self-management at their own pace, with the knowledge that the clinician is always available to assist, is most likely to positively impact the patient's health.

Frequently Used Self-Management Support Strategies

Self-management support strategies fell into four broad categories: traditional CDSME programs, computer/ mobile apps, support groups, and family-centered care. Some modifications to traditional CDSME were described, including delivery by trained lay people or through telehealth applications. Other themes that emerged were effectiveness of self-management education; need to tailor interventions; value of face-to-face scheduled interactions; and health disparities associated with socioeconomic class. Self-management support promises to provide an opportunity for clinicians to engage their clients and to positively impact health outcomes for patients with chronic conditions.

Traditional Chronic Disease Self-Management Education

Traditional CDSME programs, with or without modification, provide a structured platform to address all key factors associated with self-management of chronic conditions. Whether they are developed for a particular condition or intended for patients managing a variety of conditions, these programs provide not only knowledge, but support and encouragement. Participation has been tied to an improved ability to monitor and track chronic conditions, and to implement positive health behaviors (Dye et al., 2018). Several studies support the effectiveness of trained volunteer peer educators to deliver the course content. Participants in peer-led programs were more likely to move from the cognitive to behavioral stage of change (Dye et al.,

2016). In traditional programs where leaders had less formal training, participants had greater increases in self-efficacy and cognitive symptom management, with a greater reduction in fatigue (Brady et al., 2017). Training of volunteer peer educators or health coaches enhances the health of both the volunteer and the clients they serve, and may be especially useful in promoting healthy lifestyles within the community (Steinman et al., 2020).

Traditional programs are characterized by a strong structured and systematic approach. Each of these programs address all six skills required for self-management: problem solving, decision making, resource utilization, formation/ maintenance of patient-provider partnership, action planning, and self-tailoring. When combined with the encouragement to embrace healthy lifestyle choices, the programs are indispensable to providing self-management support (Allegrante et al., 2019). Although the majority of participants in traditional programs enroll in urban settings, those from rural areas who enroll are more likely to complete all classes (Smith et al., 2017); the programs benefit participants from every geographic region. Use of telehealth and distance instructional technology promises to make these classes more accessible for rural residents.

Computer/ Mobile Apps

A variety of mobile apps were investigated for managing chronic conditions, symptom monitoring and tracking, and medication usage. Jeffrey and colleagues (2019) looked specifically at the use of mobile apps by patients with Type 2 diabetes and found that recommendation by a health care professional was key to their implementation; none of the non-app users had ever had a health professional discuss with them the use of an app. For those who did use a mobile app for self-management, only a small portion reported that their health care provider was involved in their app use. However, the users most satisfied with the mobile apps

reported that they were recommended by a health professional and that they had positive interaction with them. A study of the use of a medication management mobile app for older adults in rural areas found that even less tech-savvy users were able to navigate the app, and that the app was rated as useful, although the advanced features were rarely used (Shade et al., 2019). Researchers in Cambodia used a mobile app, in conjunction with peer educators and a central database including patient demographics, health outcomes, laboratory results, doctor appointments, and pharmacy information, to deliver targeted self-management messages. Participants preferred voice over text messages, and that the messages arrive around dinner time (Steinman et al., 2020).

Support Groups

Support groups provide help for patients with chronic conditions and their families in a number of ways. Perhaps most importantly, they reassure the person facing a chronic condition that they are not alone in their journey and that others have successfully navigated similar pathways. The use of electronic support groups is especially promising for rural residents or patients confined to home, who may not be able to regularly travel to an in-person meeting. Key to the benefits of support group is the building of open, trusting relationships. Banbury et al. (2018) found that even those with limited technical proficiency could actively participate in electronic support groups, and that they improved knowledge, insights, and skills as well as traditional face-to-face meetings. Optimal success of such groups is dependent on adequate IT training and support for facilitators and participants.

Patients who are actively engaged in support groups show improved self-efficacy and an improvement in health behaviors (Cutler et al., 2018); improvements may be sustained by continued participation. Healthy behaviors such as exercise and proper food selection will

positively impact a variety of conditions. Emerging technology has increased accessibility to support groups, which may be offered in a face-to-face, online, or blended model (Sangrar et al., 2018). Individual preferences and technology factors will influence the effectiveness of any support group.

Family-centered care

Although only one study focused primarily on family-centered care, several authors alluded to patients' desire for more education for family members and friends (Andersen et al., 2017; Angwenyi et al., 2019; Davisson et al., 2017). For optimal effectiveness in improving clinical outcomes, family-centered care must be tailored to provide the appropriate type of support (informational, instrumental, and emotional) and should utilize active learning strategies (Deek et al., 2016). Communication with family and friends is one of the focus areas of the traditional CDSME programs, and the research shows that it is, indeed, a valuable portion of any program.

These studies support a need to evaluate and optimize family support as patients learn to manage their chronic condition, especially as the patient becomes more dependent. Transitions in care, for example from an acute hospitalization back into the home, provide opportunities for the clinician to re-evaluate whether the patient and family are receiving the necessary level of support. Including family members in CDSME from the beginning may provide an additional layer of support as aging patients lose their ability to care for themselves.

Data Analysis

Benefits of CDSME, including improved health outcomes and increased self-efficacy, are evident throughout the published literature. Engaged patients are better able to manage chronic conditions, avoid complications of disease, and to live well despite their medical conditions.

Clinicians caring for patients with chronic conditions should be aware of resources available to assist patients in optimal self-management. Some self-management support strategies are particularly well-suited to face-to-face interactions; the clinician may choose to focus on these strategies while the patient is in the office, while referring the patient to other resources such as support groups which the patient may access on their own.

Conclusion Drawing and Verification

Clearly, patients who practice self-management of their chronic conditions fare better than those who do not. Clinicians wishing to empower patients to engage in self-management must individualize their approach for each case. It is important to consider each patient's willingness and ability to participate in self-care management, as failure to provide adequate support may place an additional burden on those who are already overwhelmed or do not feel that they are valued or listened to (Andersen et al., 2017).

As patients are expected to be more involved and active in their own care, it is important to ensure that they are interested in and capable of embracing the more active role. Hardman and colleagues (2020) found that socioeconomic status moderates the effectiveness of self-management support strategies, and that tailoring the strategies implemented is a crucial step which may be overlooked. Recognizing and targeting specific barriers to self-management education for each patient is the only way to prevent a widening of socioeconomic and geographic health disparities. Individually tailored programs, especially those of longer duration, were more effective for adults with chronic health conditions.

The primary care provider is in a unique position to empower their patients and families toward effective self-management. Rather than simply writing a prescription for an evidence-based treatment, the clinician can engage in shared decision-making with the patient to find the

treatment which best suits the patient. An open and honest discussion of patient values and priorities will benefit both the patient and clinician as decisions are made. The clinician should specifically ask the patient whether the plan of care is acceptable, or if there are particular barriers to its implementation. Collaboratively adapting the plan of care to account for any perceived barriers empowers the patient and demonstrates that their voice is heard.

Ethical Considerations

This integrative review did not involve the use of human subjects, but was based on previously published research. Approval from the Institutional Review Board (IRB) of Liberty University was sought and attained following completion of the Collaborative Institutional Training Initiative (CITI) research basic course. The IRB approval letter and CITI certificate of completion are included in appendix C and Appendix D for review.

Timeline

Completion of the integrative review serves as the doctoral scholarly project of the author and has been in progress throughout the course of study. A timeline listing completion dates for various aspects of the project is included in Appendix A. Anticipated dates of completion for future aspects such as dissemination of the review are included.

Section Five: Quality Appraisal

Sources of Bias

This integrative review was completed by a single researcher. Articles of interest were identified and selected based on subjective analysis of whether the article met inclusion criteria. Only articles published in English were reviewed. Articles reporting the success of self-management support strategies may be more likely to be published than any trials which did not

show a positive impact. Most of the articles reviewed were from studies conducted in the United States.

Appraisal Tools

Once articles were selected for review, each was appraised using the Rapid Critical Appraisal Checklists developed by Melnyk and Fineout-Overholt (2015). Each article was graded for level of strength using the Melnyk pyramid, which ranks systematic reviews and meta-analyses as the strongest level, and expert opinion as the weakest level of evidence. Of the 26 articles reviewed, 8 were in Level One, 5 were in Level Two, 3 were in Level Three, 2 were in Level Four, and 8 were in Level Six. Although rated lower in the strength of evidence pyramid, the articles in Level Six provided insight from qualitative studies and descriptive design studies which was not available in the reports of the higher ranked randomized controlled trials. Articles from every level were included in the review to provide a more complete description of all available research.

Critical Appraisal and Applicability of Results

Synthesis

Current literature continues to support the use of CDSME, and reinforces the premise that patients who engage in self-management require assistance from their health care team. Patients from all socioeconomic and geographic backgrounds benefit from self-management. Optimizing self-management for each patient is dependent upon individualization of the support provided. Clinicians providing primary care in rural areas must be familiar with local resources and be able to refer the patient to those from which they will most benefit.

Clinicians supporting their patients in development of self-management skills must take a structured, yet individualized approach. The framework for formal CDSMP highlights areas to

target for any adult facing a chronic condition: managing symptoms, managing fatigue, coping with stress, handling depression, communicating with doctors, managing medications, eating healthy, and being active (CDC, 2021). After assessing the patient to determine their interest in and ability to self-manage their chronic conditions, a simple checklist can remind clinicians of what topics have been and need to be covered. Specific barriers to self-management must be identified and addressed. Family involvement should be encouraged as the patient desires.

Feasibility

In today's health care system, primary care providers must carefully consider how to spend the limited time they have with the patient in an office appointment. Unfortunately, patient education may be low on the list of priorities for patients with many needs. However, when the benefits of self-management are considered, it is evident that the time supporting patients as they learn self-management skills is time well spent. Self-management support for patients with chronic conditions is an ongoing process, and needs will vary over time.

Acceptability

As mentioned previously, care must be taken to assure that patients recognize self-management support as a help, rather than perceiving that they are being forced into a role of responsibility they are not ready to accept. Likewise, the clinician must be willing to divest some of their own responsibility for a patient's chronic condition. All members of the health care team, including the patient, must share the same goals. Based on the literature reviewed, patients are able and willing to accept more responsibility in exchange for having a more active voice in the management of their health.

Effectiveness

There is ample evidence to support the effectiveness of CDSME. For all chronic diseases studied, self-management improves disease outcomes and health behaviors, and improves the patients' self-efficacy with communicating with providers. Patients who are willing to participate in CDSME may be especially motivated toward making behavior changes which will improve their health (Brady et al., 2017). Providing individualized support can only enhance the learning process.

Summary of Evidence

Current published literature regarding CDSME affirms its usefulness and effectiveness. Commonly used strategies to support patients with chronic disease in self-management include traditional CDSME programs, computer/ mobile apps, support groups, and family-centered care. Effective strategies will be tailored to the patient, structured to cover all necessary skills for self-management, ongoing, and will include the family as desired by the patient. Barriers to self-management will be ascertained early and addressed as appropriate. Patient self-management efforts and positive health behaviors must be acknowledged and encouraged.

Clinicians should become familiar with the educational materials provided to patients within their clinical setting. Rather than simply having the nurse print out the patient handout associated with a diagnosis and attaching it to the visit summary, the clinician can review any educational materials with the patient to ensure that they understand action steps to improve their condition. Every chronic condition has an associated foundation or organization which provides educational material and support. Helping the patient to enroll in such programs may be a better use of limited time than simply printing the same generic patient guide at each visit. Assessing

both current knowledge and what the patient needs to know, as well as the patient's preferred learning style, will help the clinician to tailor educational interventions.

Section Six: Discussion and Conclusions

Implications for Practice

Clinicians caring for patients with chronic conditions have an opportunity to positively impact lives by enabling patients to self-manage the symptoms of their disease. Recognizing that there is no "one size fits all" solution to health education, the clinician must develop an individualized plan for each patient. A reasonable first step is to determine what the patient already knows about their condition, what they need to know, and what learning strategies appeal most to the patient. Asking about barriers to self-management and addressing these concerns directly will benefit the patient and strengthen the patient-provider relationship, which is crucial to success. Considering factors of the disease such as time since diagnosis, disease trajectory, and severity, as well as patient factors such as health literacy, engagement, and computer proficiency will enable the clinician and patient to collaboratively develop a path toward meaningful self-management (Sangrar et al., 2019).

Individualized support

The importance of individualizing the support given to each patient cannot be overemphasized. Each patient brings a unique set of life experiences that influence their readiness to accept and manage a new chronic disease diagnosis. The clinician must take time to find out what a patient already knows and how they best learn before starting a systematic educational program. Helping each patient to set realistic and achievable goals is key to supporting self-management.

Prioritization of topics

Addressing the concerns that are most important to the patient first will encourage more active participation in self-management activities. The clinician should understand that each patient has their own concerns and that these may not be the same for every patient with the same diagnosis. Focusing on what is important to the patient first allows the patient to gain some control over their illness from the very start. Once their primary concerns are answered appropriately, the patient is then able to learn additional information as well. Devoting time and attention the patient's initial questions and concerns also reinforces the utility of maintaining an effective patient-provider relationship.

Family support

Patients who are learning to self-manage a chronic condition require support not only from the health care team, but also from their family and friends. When a patient is diagnosed with a chronic condition, the entire family often undergoes adjustments to lifestyle and routine. Informed family members who understand the expected course of illness are better able to support the patient. Often, family members themselves need support as they make changes and decisions. Including family members in self-care education for chronic conditions enhances patient outcomes and healthy behaviors (Deek et al., 2016).

Offer resources

Clinicians must become familiar with resources to help manage chronic conditions which are available within their own community. These resources should be offered to the patient not only at the time of initial diagnosis, but on an ongoing basis as the patient learns self-management skills. Some patients may initially decline participation in support groups, but later decide to participate.

Review symptoms and progress

Successful self-management support is dependent upon a relationship with the patient which allows the nurse practitioner to effectively tailor treatment for each individual. The patient and clinician must work together to achieve reasonable, individualized goals. Often, the first step toward achieving such a relationship is to simply listen to what the patient is saying. When the patient is allowed to express their own priorities and values, the clinician can address these concerns first. The clinician should always ask about specific strategies the patient is using, and take time to review symptom logs or digital apps. Developing an action plan for successful self-management efforts and celebrating even small victories engages the client to live well even with a chronic condition.

Limitations

This integrative review failed to identify any single self-management support strategy which will be effective for every patient with a chronic illness. Rather, the sum of the evidence suggests that an individualized approach for each patient is crucial to success. Limited study of effective strategies for supporting self-management among rural residents has been published. Future studies of CDSME should include a more complete description of specific interventions utilized. Provision of self-management support in a traditional office visit may be limited by the amount of time available for the clinician. Ensuring that payment for educational and emotional support provided by the clinician is covered by Medicare and insurance companies may help to normalize self-management support as a regular part of both well and sick visits.

Dissemination

This integrative review will be submitted for publication in Scholar's Crossing. Findings from this integrative review will be presented via a poster presentation at the Missouri

Association of Nurse Practitioners' yearly conference. A supplemental article, titled "Putting the Patient in the Driver's Seat: Self-Management Support Strategies" will be submitted for publication.

Conclusion

Much research has shown that CDSME programs are effective tools for helping patients to manage chronic conditions. Active participation in self-management activities is associated with a higher quality of life, lower cost of care, and lower disease burden. Less research is available regarding the impact of self-management education for patients living in rural areas. Health disparities between urban and non-urban geographic areas may be ameliorated through the careful use of strategies which engage patients with chronic conditions in self-management. Identifying and implementing effective CDSME programs may benefit public health and the health care system as a whole (Allegrante, 2019).

Becoming familiar with patient resources available in their own community, as well as those offered electronically, will enable the clinician to better support patients and families as they actively engage in self-management of chronic conditions. Practicing a wide variety of support strategies will empower the clinicians to provide individualized and effective support. Maintaining a healthy patient-provider relationship, encouraging healthy behaviors and supporting self-management efforts, will benefit both the patient and clinician. Identifying and implementing effective CDSME programs may benefit public health and the health care system.

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Appendix A.

Step 1: Review Scholarly Project Process, Sequence, and Timelines	September 1, 2020
Step 2: Complete CITI Training	September 15, 2020
Step 3: Develop first draft of proposal and submit to chair for review	October 25, 2020
Step 4: Complete final draft of proposal	November 8, 2020
Step 5: Defend Scholarly Project Proposal	December 8, 2020
Step 6: IRB approval for proposed project	January 4, 2021
Step 7: Initiate scholarly project	January 4, 2021
Step 8: Complete literature review/level of evidence/summary matrix	February 14, 2021
Step 9: Complete thematic data analysis matrix	March 26, 2021
Step 10: Complete initial draft (without discussion and conclusions)	April 4, 2021
Step 11: Update and reconfirm timeline	May 21, 2021
Step 12: Submit completed first draft with discussion and conclusions	April 28, 2021
Step 13: Submit to Editor (one week turnaround)	June 21, 2021
Step 14: Request final defense appointment	June 28, 2021
Step 15: Submit final PowerPoint for defense	June 28, 2021
Step 16: Final Defense	July 12, 2021
Step 17: Submit to Scholar's Crossing	July 20, 2021

Appendix B

Main Author/ Year/Abbreviated Title	Study Purpose/ Objective	Design, Sampling Methods, and Subjects	Melnyk Level of Evidence	Study Results/ Outcomes	Study Strengths & Limitations
Allegrente. 2019. Interventions to support behavioral self-management.	1)Examine concept, theories, and intervention methods that underlie CDSM programs. 2) Summarize selected CDSMP used in high- prevalence diseases. 3)Synthesize evidence for effectiveness of CDSM interventions	Meta-analysis of selected outcomes from RCTs of CDSM interventions in 10 Cochrane systematic reviews.	Level 1: Meta- analysis	Chronic disease self-management interventions are associated with improved health behaviors, health outcomes, and quality of life, and with decreased health care utilization and societal cost burden for chronic conditions.	Comprehensive review of studies including variety of CDSM interventions; limited consistency of reported measures makes comparisons difficult.
Andersen. 2017. Experience of patient as participant in self- management.	To explore patient experiences when participating in self- management following hospitalization for severe COPD exacerbation.	15 adult patients with COPD who were hospitalized with severe exacerbation and discharged with self-management support. Repeated observations and in-depth interviews for 18 months post- discharge.	Level 6: single descriptive study	Prior to discharge, patients' main concern was regaining control. Patients continued to struggle with staying motivated to comply with recommendations, remain confident, and ask for help.	Qualitative study with small sample size from one program.
Angwenyi. 2019. Self-management outcomes among rural Malawi receiving home- based care.	To examine the impact of Community Based Home Care on self-management outcomes (health status, self-efficacy) for patients with HIV and non-HIV chronic disease in Malawi.	140 adult patients with HIV or non- communicable disease enrolled in four health organizations. 102 females, 38 males. Mean age 42 years. Pre- and post-evaluation surveys were collected.	Level 3: Quasi- experimental	Self-efficacy dropped from 5.91 at baseline to 5.1. Self-efficacy for patients with HIV and multimorbidity were lower. Self- efficacy was more likely to rise for those with chronic conditions of longer duration and for those whose CBHC programs included continued home visits.	Conducted in Malawi, includes health care organization that is dissimilar to US.
Banbury. 2018. Telehealth interventions delivering home- based support group videoconferencing.	To review the literature to determine the feasibility, acceptability, effectiveness, and implementation of health professional-led group videoconferencing to provide education and/or social support in the home setting.	17 records included in review. Analysis framework included hierarchical terms feasibility, acceptability, effectiveness, and implementation.	Level 1: Systematic review	Home-based videoconferencing sessions are feasible even to those with limited digital literacy. Acceptability was rated as high with little concern for privacy issues. Some participants reported preferring face to face meetings. Good IT support and training is essential. Video groups were able to	Improved health outcomes were reported in many studies, but not reported due to the variance between what was reported in different studies.

				replicate group processes such as bonding and cohesiveness.	
Bobitt. 2019. Geographic and social factors associated with participation in CDSMP.	To examine relationship between program factors and participation. Factors looked at included: program type (CDSMP or DSMP), workshop location, class size, and number of sessions attended by participants. Demographics for enrollees was also collected and analyzed.	1638 participants aged ≥50 years at 144 sites in Illinois, Chronic Disease self-management program and diabetes self-management program conducted weekly for 6 weeks. Linear logistic regression analysis to examine relationship between participation and program factors. 1295 complete records were reviewed; analysis included rural/urban address, # of programs attended.	Level 4: correlational study	Members in rural counties were more likely to complete program. Average number of sessions completed was 4.2. More participants completed diabetes program than generic chronic disease program. More enrolled participants at site (>16) was associated with greater participation. Only 7% of enrollees came from rural counties.	1295/ 1638 (~79%) of enrollees had complete information for analysis.
Brady. 2017. Do program implementation factors or Fidelity affect CDSME programs' outcomes?	To determine whether program implementation factors (delivery setting, paid/ unpaid participant, paid/ unpaid leader, leader has disease, hours of leader training) and whether program met all 6 basic fidelity requirements impacted outcomes.	34 studies of Arthritis Self-Management Programs (ASMP) and CDSMP were evaluated; outcome assessed at baseline and 4 to 6 months post completion. An average of 80% participants were women; 42% were in US; 28% UK; 25% Canada, and 5% Australia. 12 implementation factors originally considered; 6 had large enough sample sizes for evaluation. 18 outcomes in 4 categories included: health behaviors; psychological health status; physical health status; and health-care utilization.	Level 1: Meta-analysis	Modest to moderate outcome differences were found for 4 factors: participant paid; leader paid; leader training time; and implementation fidelity. Findings were counter-intuitive with better results when leaders and participants were unpaid, leaders had less than minimum training, and program did not all fidelity requirements.	All studies did not report same implementation factors, so only half of those proposed for inclusion were analyzed. Those which were analyzed were not uniformly represented across all studies. Most studies included predominantly white populations.
Coultas. 2018. Home-based coaching, physical activity, and health care utilization among COPD patients.	To determine whether behavioral intervention and self-management education program would impact physical activity level and health care use for patients with COPD.	325 outpatients with stable COPD. Random assignment: 156 received usual care; 149 were enrolled in the trial. Average age was 70.3 years. 50.5% were female. All participants received 6-week standard self-management course. Treatment group received home-based telephone support for 20 additional weeks. Self-reported physical activity collected 6, 12, and 18 months after randomization.	Level 2: randomized controlled trial	At 18 months, 73.6% of treatment group vs 57.8% control reported being persistently active. For those in the most severe illness category (FEV1 <50% predicted) intervention group reported being persistently active more frequently compared with usual care (63.3 vs. 50.8%). Respiratory health care utilization was lower in the intervention group only for those with the most severe illness.	Activity level was only self-reported; the intervention group but not usual care group received pedometers. Only respiratory-associated health care use was considered.

		Associations analyzed with log-binomial and Poisson regression models			
Cutler. 2018. Effectiveness of group self-management interventions for those with chronic conditions.	To evaluate effectiveness of group self-management support for improving self-efficacy, clinical outcomes, and decreasing hospitalizations.	10 studies of group support for chronic condition education were evaluated; 5 of these were for diabetes, 2 were generic, 2 were weight loss related, 2 were focused on minority groups. Of the 10 studies, 2 were RCTs and the remainder used mixed methods, surveys, and longitudinal evaluations. Studies were examined for effect of group interventions on self-efficacy, clinical outcomes, and hospitalization rate.	Level 1: Systematic review of RCTs and investigative studies	Self-efficacy improved in the areas of comfort in speaking with provider, exercise, and diet. Glycemic control improved. Self-regulation improved over time. No studies looked at co-morbidity or complexity of conditions. Higher medication self-efficacy was related to better adherence to medication regimen.	Comparison of results from different studies was complicated by use of many different tools to track effectiveness of programs.
Davisson. 2018. Patient and nurse experiences in rural chronic disease management program.	To evaluate the nurse-led “Living Well” chronic disease management program by obtaining patient perspectives and researcher observations from the diabetes, heart failure, and COPD classes.	Participants in the “Living Well” program, 6 patients and 2 nurse clinicians, were surveyed. 5 of the 6 patients were female, ages were 64-84, and all reported more than one chronic condition.	Level 6: Single Qualitative Study	Nine themes emerged: importance of relationship with nurse coordinator/ nurse knowledge; nurse availability; value of the nurse; knowing you’re not the only one; overcoming barriers to self-management; group comradery; adherence enhancement; and the need for improved knowledge among family and friends.	Single, small study conducted by same clinicians who provide intervention. May not be generalizable to larger population.
Deek. 2016. Family-centered approaches to chronic disease management in adults.	To identify elements of effective family-centered self-care interventions that are likely to improve outcomes of adults living with chronic conditions.	Ten quantitative studies targeting patient outcomes were reviewed; narrative summary approach was used to report data.	Level 1: Systematic Review	Elements of effective interventions used were a family-centered approach, active learning strategy, and transitional care with appropriate follow-up.	Effective self-management interventions were identified, including a family-centered approach. Lack of consistency across studies and relatively little published data available regarding family role in self-management of chronic diseases.
Dye. 2016. Activating patients for sustained CDSM: Beyond clinical outcomes.	To describe impact of 8-week community program on hypertension self-management delivered by trained volunteers.	185 adult patients with hypertension were randomized to treatment (n=101) or wait-list control (n=84). Both groups had similar demographics, mean age 64.5 c and 64.7 t, 63.1% female c, 71.3% t; 86.9% white c, 87.1% white t, and	Level 2: Randomized Controlled Trial	Participants in program were more likely to move from the cognitive to the behavioral stage of motivational readiness for being physically active, practicing healthy eating habits, handling stress well, and living an overall healthy lifestyle. They also showed a greater increase	Demonstrated that well-trained volunteer Health Coaches delivering standardized CDSM program for hypertension were effective in improving patient outcomes. Study results may be attributable to program content rather than on facilitators.

		only one primary chronic condition 65.5% c and 67.3% t.		in perceived competence for self-management, greater increase in hypertension-related knowledge.	
Dye. 2018. Improving CDSM by older home health patients through community health coaching.	To describe a pilot test of a model to reduce hospitalizations and ED use among rural older adults with chronic diseases discharged from home health services through the use of community volunteer health coaches.	65 rural patients with CVD, CHF, or DM, aged 61-96 years, who were discharged from home health services; 33 patients had complete information at 2 months, 4 months, and 10 months post-discharge from HHS. Matched comparison group of 36 patients with similar diagnoses and age.	Level 2: Randomized Controlled Trial	Members of intervention group were less likely to receive ED care for at least one of their original diagnoses, at less cost per episode. No treatment group participants were admitted for falls or flu, compared to 7/36 in the control group.	Data was collected from only one HHS entity. Cost of training for volunteer health coaches was not included in final analysis of health care costs. Of 65 participants initially referred, and 53 selected to participate, only 33 had complete data for all points in time.
Gagné. 2020. COPD-specific self-management support linked to higher quality of life, health behaviors, and skill and technique acquisition.	To describe impact of COPD self-management support provided by trained professionals on quality of life, health behaviors, and comfort with self-care.	54 adults with COPD, average age 68 years; 31 were female. 4 professionals (1 nurse, 3 RT) completed 7 hour training session. 1 or 2 educational sessions were provided to patient. Questionnaires completed at baseline and 6 months post educational session: St. George Respiratory Quest for COPD; whether pts had unscheduled ER or physician visit; Survey on Living with Chronic Diseases in Canada; Health Education Impact Quest. For health-directed behaviors and skill and technique acquisition. Pre/ post scores on each questionnaire were analyzed using mixed models to estimate mean differences and prevalence ratios, with associated 95% confidence intervals.	Level 3: Quasi-experimental	Quality of life improvements were clinically important. There was no difference in health care utilization. Health directed behaviors and skill acquisition were better for those who received the educational session.	No control/ non-treatment group was used.
Hardman. 2020. What impact do CDSM support interventions have on health inequity gaps?	To assess the moderating effects of socioeconomic status on self-management support interventions in relation to participation, retention, and post-intervention outcomes.	19 studies reviewed: 5 on participation, 5 on attrition, and 9 on outcomes following self-management support interventions.	Level 1: Systematic review	Socioeconomic factors affect the efficacy of self-management support strategies. SMS may inadvertently exacerbate the social gradient in chronic disease. Tailored approaches are required to provide appropriate interventions for those most likely to benefit.	Comprehensive evaluation: confirms that those in lower SES groups are less likely to enroll in traditional SM support and may be more likely to drop out. Questions use of “low SES” as population group as this is a heterogeneous group.

<p>Horrell. 2017. CDSME courses: Utilization by low-income, middle-aged participants</p>	<p>To compare the extent to which middle-aged adults have engaged in CDSME, and to identify socioeconomic characteristics of lower-income, middle-aged participants.</p>	<p>Characteristics of CDSME program participants from poorest region were analyzed. 55 people (representing only 0.3% of total participants) from most impoverished regions were included. Middle-aged (50-64 years) participants were more likely to identify as Hispanic, African American, and American Indian than overall population. Most participants report experiencing 2-3 chronic health conditions.</p>	<p>Level 1: systematic review</p>	<p>Middle-aged participants from the poorest economic regions were significantly more likely to complete the entire series of CDSME classes once enrolled.</p>	<p>Socioeconomic status was determined not by individual reported income, but by area of residence.</p>
<p>Jeffrey. 2019. Mobile phone apps and use in SM of T2DM.</p>	<p>To evaluate the experiences, barriers, and facilitators to app usage among adults with type 2 diabetes and to determine recommendations for improved usage of diabetes apps.</p>	<p>Australian adults with type 2 diabetes for greater than 6 months, 16 app users and 14 non-app users completed semi-structured telephone interviews based on the Technology Acceptance Model, Health Information Technology Acceptance Model, and Mobile Application Rating Scale. Data were analyzed using deductive content analysis.</p>	<p>Level 6: Single qualitative study</p>	<p>Most app users reported an improvement in diabetes management. Facilitators to app use included recommendation by PCP, visual representation of trends, easy use, and convenience. Barriers included lack of awareness of available apps, perceptions of disease severity, technology and health illiteracy, and connectivity issues. Users did not use medication reminders.</p>	<p>Provides information regarding specific features patients find useful in mobile apps. May not be generalizable to US population as standard glucose monitoring systems are in different units.</p>
<p>Jonsdottir. 2015. Effectiveness of partnership based self-management programme for patients with mild and moderate COPD: A pragmatic RCT</p>	<p>To provide further information on effectiveness of COPD CDSME when delivered to patient and family.</p>	<p>Participants were aged 45-65 years old, with mild to moderate COPD, and had family member available to participate with them. Participant and family member completed 6 month CDSME and data collected at baseline, 6 months, and 12 months.</p>	<p>Level 2: randomized controlled trial</p>	<p>Participants reported perception that disease was less intrusive than those in control group. No significant differences were seen in quality of life, anxiety or depression, physical activity level, number of exacerbations, or smoking status. Participants in both groups reported that participating was useful and important.</p>	<p>Small sample size: few family members participated; both control and experimental group received self-management education.</p>
<p>Liou. 2019. Improving self-care efficacy and quality of life with a self-management program among patients with</p>	<p>To evaluate effectiveness of COPD CDSME program on self-efficacy and quality of life.</p>	<p>Purposeful sample of 60 participants with COPD treated at medical center in Taiwan. All participants in control group were male, compared with 18/26 in the experimental group. Average age was 77.7 for control group, 81.0 for self-</p>	<p>Level 3: quasi-experimental design</p>	<p>Participants in the education arm reported less dyspnea at 2 months, and increased self-efficacy and CCQ scores at 3 months.</p>	<p>All participants came from same medical center; subjects were not randomly assigned to groups. Results were limited to 3 months following hospitalization for acute event, without longer follow up.</p>

<p>COPD: A quasi-experimental study</p>		<p>management group. Both groups were equal for number of comorbidities (2). The experimental group had more hospitalizations for COPD (3.3 vs 1.8) and were less likely to use home oxygen (69.9% vs 96.6%). Medical Research Council (MRC) dyspnea scale; COPD Self-efficacy Scale (CSES), and Clinical COPD Questionnaire (CCQ) were completed at baseline, 1 month, 2 months, and 3 months post discharge.</p>			
<p>Odgers-Jewell. 2015. Group facilitators' perceptions of the attributes that contribute to the effectiveness of group-based CDSME programs</p>	<p>To explore perceptions of CDSME facilitators regarding factors that enhance programs</p>	<p>14 CDSME program facilitators were interviewed in semi-structured processes. 12/ 14 were female. Only 2/ 14 had the condition they were addressing. Facilitators included dietitians, nurses, and other health professionals, with 13/14 holding at least a bachelor's degree. All programs included either one session or one session plus a supermarket tour. Interviews were recorded, auto-transcribed, and analyzed using thematic content analysis.</p>	<p>Level 6: single qualitative study</p>	<p>Few facilitators were trained prior to implementing CDSME program. Outcome measures were limited, and facilitators were unsure of evidence base for the programs. Group interactions, multidisciplinary teams, non-didactic style of delivery, and use of practical activities were seen as most effective.</p>	<p>Participants were from single geographic region (South East Queensland); programs were mostly one-time educational sessions rather than longer-term CDSME programs.</p>
<p>Park. 2020. Evaluating the effect of a smartphone app-based self-management program for people with COPD: RCT</p>	<p>To determine effectiveness of smartphone-based app on self-care behavior for patients with COPD.</p>	<p>44 adults with mild to moderate COPD recruited from two outpatient clinics in Korea. Participants were mostly male (78%); average age 70 in experimental group and 65 in control group; living with someone (both groups); and with COPD meeting GOLD criteria for Stage 1 or 2 (77.3% experimental, 80% control). Both groups received 4 in-person education sessions and 4 group exercise sessions in first month; experimental group received phone app and control group</p>	<p>Level 2: Single randomized controlled trial</p>	<p>At 6 months, the only statistically significant difference between the groups was that self-care behavior was greater for the experimental group. Compared to baseline, those in experimental group had improved self-care behavior, longer distance on 6 minute walk time, increase in total activity, better self-efficacy for maintaining exercise. For the control group, there were no significant changes from baseline in these measures.</p>	<p>Both groups received significant level of education and support; participation in trial (either group) was limited to those who had and used a smartphone.</p>

		received monthly telephone call. Both groups completed questionnaires/ interviews every 4 weeks for 6 months; the intervention group also monitored symptoms, exercise, and physical activity using the app.			
Patel. 2016. COPD patient experiences with enhanced self-management model.	To investigate how far individuals embraced the electronic diary and experienced it as an aid to the self-management. Secondly, also investigated importance of nurse visits in the process.	COPD patients using electronic diary to monitor, record, and transmit personal health data, as part of enhanced self-management model which also included regular nurse visits. Questionnaires administered to enrollees in enhanced self-management model to examine qualitative aspects of participation in study.	Level 6: descriptive design	Users of electronic diary reported psychological benefits, more perceived support, and increased awareness of personal symptoms and symptom management. Nurse support was categorized as essential. Users had fewer hospitalizations.	Convenience sample of patients already participating in separate study.
Sangrar. 2019. Blended face-to-face and online/ computer-based education approaches in chronic disease self-management: A critical interpretive synthesis	To review the literature on CDSME that blend face-to-face and online/ computer-based education design and delivery	Original articles published in English between 2004- 2019 were reviewed, focusing on blended educational delivery styles for CDSME. 12 studies were identified: 10 of these focused on diabetes or prediabetes. 7 were from US, 1 from Norway, 2 from the Netherlands, 1 from Taiwan, and 1 from Thailand. Studies were narrowed to 12 which included both face-to-face and tech components for at least one aspect of education regarding chronic illness.	Level 1: systematic review	Critical interpretive synthesis generated 3 major themes: the ideal participant (time since diagnosis); why it might work (learning and teaching styles); and rolling it out (implementation including roles of the health care provider, technology application, and interplay between face-to-face and tech).	Technology has changed a lot over the past 15 years. Blended learning options are the least frequently reported on.
Shade. 2019. Ease of use and usefulness of medication reminder apps among rural aging adults.	To explore the usability of a mobile medication reminder app among older adults in rural areas.	15 participants selected from convenience sample of adults aged 55 and older who live in a rural area, use a mobile device and take 3 or more prescription medications daily. Medisafe app was tested for two weeks.	Level 6: Single descriptive study	Participants reported the app was not difficult to use. At two weeks, average weekly medication use was 92%, although 46% of participants forgot to log scheduled medications. Most features of the app were not used, but medication reminders and trackers were.	Demonstrated that even older adults can be comfortable with use of mobile apps. Small sample size and short term of testing limited ability to test certain features of the app such as automatic refills.
Smith. 2019. Geographic disparities	To investigate the relationship between those traveling greater	2,108 adults aged 51 and older from central Texas who have at least one chronic condition and have visited	Level 6: Single	Respondents with more chronic conditions and those attending CDSME programs reported	Study covered relatively small geographic area. No collection of

<p>associated with travel to medical care and attendance in programs to prevent/ manage chronic illness among middle-aged and older adults in Texas</p>	<p>distances for medical care and their utilization of programs to prevent and/or manage health conditions</p>	<p>doctor within past year. Questionnaires completed by participants were evaluated to determine relationship between miles travelled for health care and other significant variables, using ordinal logistic regression model. Binary logistic regression model was employed to identify factors associated with attending CDSME program.</p>	<p>descriptive study</p>	<p>travelling greater distances to receive medical care. Respondents with limited activity, from urban counties, and those who travelled further were more likely to participate in CDSME program. Rural residents were less likely to participate in CDSME programs, potentially choosing to limit their travel for more emergent or urgent needs rather than for preventive care.</p>	<p>data regarding purpose of medical travel.</p>
<p>Smith. 2017. Dissemination of CDSME programs in US: Intervention delivery by rurality.</p>	<p>To identify the geospatial dissemination of CDSME programs across the US in terms of participants enrolled, workshops delivered, and counties reached. Dissemination characteristics were compared across rurality designations (metro, non-metro adjacent to metro, non-metro not adjacent to metro areas).</p>	<p>Data analyzed from national repository including 83 reporters from 47 states from December 2009 to December 2016.</p>	<p>Level 4: Correlational design</p>	<p>CDSME programs were offered in 56.4% of all US counties. 50.5% of workshops were offered in non-metro areas. 12% of participants attended workshops in non-metro, adjacent to metro areas and 7% attended in non-metro, not adjacent to metro areas. Participants in non-metro areas had higher attendance and retention than those in metro settings.</p>	<p>Data examined included a large amount of information; socioeconomic and demographic information such as education level, income, and race were based on zip code characteristics but participants in CDSME program may not be representative of entire area population.</p>
<p>Steinman. 2020. Facilitators and barriers to CDSM and mobile health interventions for DM and hypertension in Cambodia.</p>	<p>To understand the facilitators and barriers to chronic disease management and the acceptability, appropriateness, and feasibility of mHealth to support chronic disease management and strengthen community-clinical linkages to existing services.</p>	<p>Semi-structured interviews and focus groups were conducted with peer educators and people living with diabetes and / or hypertension. Thematic analysis identified key facilitators and barriers to disease management and opportunities for mHealth content and format.</p>	<p>Level 6: Single qualitative study</p>	<p>Peer educators desired the mobile messaging intervention to address reminders about medication, lab tests, and doctor appointments. Participants preferred voice messages over text and preferred that they arrive at dinnertime.</p>	<p>All participants were already receiving support from trained peer educators. Study was conducted in Cambodia and results may not be generalizable to US.</p>

Appendix C

Main Author	Strategy	Effectiveness	Approach Recommendations
Allegrante	Traditional CDSMP programs	CDSME has the potential to improve self-efficacy, health behaviors, health status, and quality of life	Health care system should prioritize identifying and implementing effective self-management programs.
Andersen	Family participation Individualized care/ teaching	Patients have interest in actively participating in care, but need adequate support	Acknowledge patient self-care activities and behaviors Encourage atmosphere where patients feel valued and listened to.
Angwenyi	Trained lay persons delivered Community home-based care: Regular home visits for disease monitoring, psychosocial support, and information	Reduction in patient-reported pain level, fatigue, and illness intrusiveness. General health status and quality of life improvements were not statistically significant.	N/A Described home care provided by lay persons
Banbury	Telehealth Home-Based Support group videoconference	Videoconference support group matched in person support group for development of health knowledge, insights, and skills	N/A Web based support groups may be more accessible for rural residents, universally acceptable with few privacy concerns. Useful even for those with limited tech proficiency.
Bobbitt	Traditional CDSMP	Rural participants more likely to complete all sessions. Rural areas are underserved: in Illinois, 18.6% of adults live in rural counties, but only accounted for 6.6% of sample of participants in CDSME and DSME programs.	Suggests that even rural clients may benefit from traditional programs. Consider offering programs at sites such as assisted living facilities.
Brady	Traditional CDSMP ASMP and CDSMP	Better outcomes when program leaders are unpaid, have less than minimum training, and implementation did not meet fidelity requirements.	Recruiting leaders and participants willing to participate without pay may lead to better results.

Coultas	Modified CDSMP (COPD specific) combined with physical activity coaching, provided in home setting	Patients in intervention group had higher self-reported physical activity, decreased sedentary activity, and decreased health care utilization.	Help patient to develop feasible goals and provide individualized support
Cutler	Support groups	Support groups, especially those addressing self-efficacy, were associated with improved health behaviors.	Encouraging self-efficacy in turn improves self-management and health status.
Davisson	Traditional CDSMP Support group Family involvement	Enhanced effectiveness with better nurse-patient interactions. Patients valued: health benefits (improved symptom control), practical delivery, and social/ family/ peer support.	Consistent, planned interactions with nurse educator, telephone follow-ups by nurse
Deek	Family-centered approaches	Family-centered approach associated with lower readmission rates, ED visits, and anxiety levels.	Elements of effective interventions included: family-centered, active learning strategy, and transitional care with appropriate follow-up.
Dye (2016)	Traditional CDSMP Peer-led, community-based	More in treatment group moved from cognitive to behavioral stage of motivational readiness for being physically active, practicing healthy eating habits, handling stress well, and living overall healthy lifestyle.	Provision of planned, systematic instruction provided by peers.
Dye (2018)	Traditional CDSMP Community health coaches deliver	Participants increased ability to monitor and track chronic health conditions, make positive lifestyle changes, and reduce incidence of falls, pneumonia, and flu.	Refer clients to established self-management programs led by peers
Gagné	Disease-specific CDSME provided by trained clinicians Face-to-face	Participants had improved quality of life, health-directed behaviors, and skill and technique acquisition.	Provide disease-specific education at regularly scheduled appointments/ meetings
Hardman	Variety of SMS (self-management support) strategies reviewed	Socioeconomic status moderates effectiveness of all SMS interventions. SMS may exacerbate social gradient in chronic disease outcomes.	Individually tailor interventions: find out limiting factors and target these directly
Horrell	Traditional CDSMP	Lower income middle aged participants are under-represented in participants. Those who do participate are MORE likely to complete entire program than those in higher SES groups.	Clinicians should be especially eager to enroll patients in lower SES groups into traditional programs as they are more likely to actually complete the program once they enroll.
Jeffrey	Mobile phone apps	Recommendation of app by health professional and active review by PCP	PCP should encourage/ actively ask about app use, review symptom logs, etc. Proposed weekly text messaging related to self-management.

Jonsdottir	Traditional CDSMP Family-centered	Participants viewed their illness and treatment as less intrusive than control group. No difference in quality of life, anxiety or depression, physical activity, number of COPD exacerbations, or smoking status.	Including family in teaching may improve acceptance of disease and treatment.
Liou	COPD self-management program	Participants had increased self-efficacy, higher COPD Questionnaire scores, and decreased dyspnea ratings.	Recommend self-management education included in discharge planning for patients hospitalized with COPD exacerbation.
Odgers-Jewell	Group-based CDSME programs	N/A: examination of facilitators' perceptions of the attributes that contribute to the effectiveness of group-based education programs	For group-based education, provide practical activities and use a non-didactic style; encouraged use of multidisciplinary team.
Park	Mobile app for COPD self-management education	Significant differences in self-care behavior, total activity, and percent time in moderate to vigorous physical activity	Smartphone apps may be effective tool for those with COPD
Patel	App/ Electronic symptom monitoring log + regularly scheduled nurse visits	Improved understanding of personal symptoms and self-management, reduction in hospital admission rate; patients report personal encounters via scheduled nurse visits were important.	Clinicians should review electronic symptom logs and help patients as they learn to manage symptoms. Electronic symptom diary use was well-received by patients.
Sangrar	BLENDED face-to-face and electronic/ app programs	Most blended programs are still in pilot/ feasibility phase. Electronic apps are acceptable to most patients, but effectiveness is variable.	Individualize recommendations for electronic app CDSME programs based on characteristics of user: engagement, education level, health literacy, and comfort with technology and on characteristics of disease: time since diagnosis, severity of illness, type of illness.
Shade	Mobile App	Useful/ helpful even for patients with limited tech proficiency.	Medication reminder/ manager app may be especially useful for patients who are unintentionally missing doses
Smith 2019	Traditional CDSMP	Rural residents are less likely to enroll in CDSMPs.	Consider offering CDSMPs in rural areas.
Smith 2017	Traditional CDSMP	Participants in non-urban areas had better attendance and retention in traditional programs than metro dwellers.	Refer all clients, not just urban dwellers, to CDSMP
Steinman	Traditional CDSMP Mobile app Peer educators	mHealth app used to deliver messages regarding medication reminders, lab tests, appointments, self-management education. Patients preferred voice messages rather than text (may be cultural).	Consider training lay health coaches who can provide self-management education

Appendix D

IRB Approval Documentation

LIBERTY UNIVERSITY.
INSTITUTIONAL REVIEW BOARD

January 4, 2021

Re: IRB Application - IRB-FY20-21-489 Integrative Review: Chronic Disease Self-Management Support in Rural Areas

Dear

The Liberty University Institutional Review Board (IRB) has reviewed your application in accordance with the Office for Human Research Protections (OHRP) and Food and Drug Administration (FDA) regulations and finds your study does not classify as human subjects research. This means you may begin your research with the data safeguarding methods mentioned in your IRB application.

Decision: No Human Subjects Research

Explanation: Your study is not considered human subjects research for the following reason:

(1) It will not involve the collection of identifiable, private information.

Please note that this decision only applies to your current research application, and any modifications to your protocol must be reported to the Liberty University IRB for verification of continued non-human subjects research status. You may report these changes by completing a modification submission through your Cayuse IRB account.

Also, although you are welcome to use our recruitment and consent templates, you are not required to do so. If you choose to use our documents, please replace the word *research* with the word *project* throughout both documents.

If you have any questions about this determination or need assistance in determining whether possible modifications to your protocol would change your application's status, please email us at irb@liberty.edu.

Sincerely,

Appendix E



Completion Date 15-Sep-2020
Expiration Date 15-Sep-2023
Record ID 38136215

This is to certify that:

Karla Callahan

Has completed the following Citi Program course:

Not valid for renewal of certification through CME.

Biomedical Research - Basic/Refresher

(Curriculum Group)

Biomedical & Health Science Researchers

(Course Learner Group)

1 - Basic Course

(Stage)

Under requirements set by:

Liberty University



Appendix F

