



Integrated healthcare for diabetics: a holistic approach

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a holistic approach**

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The current integrative review was conducted to seek evidence on integrated health care. The goal of this integrative literature review is to increase awareness of holistic approach in integrated health care for adult diabetic patients.

The aim is to introduce healthcare services of diabetic patients successfully integrating mental and physical care to improve the medication adherence. The research questions of this study were: How can mental support be incorporated in the physical care of diabetic adult patients? How does integrated care assist diabetic adult patients in medication adherence?.

Integrative literature review was used as the method of this study. Data search was performed in September 2018 using 5 databases. After the evaluation process, 10 articles with varying designs were included. Critical Appraisal Skills program for cohort and qualitative studies and STROBE tools were used to evaluate the quality of the chosen articles for the integrative review. Evidence from the primary studies were extracted, analyzed and synthesized by themes.

Four of the six elements of chronic care model- patient self-management support to assist patients to take active role in their care, clinical information systems, e.g. for providing feedback, and electronic registries and delivery system design to support prevention oriented clinical care and provide decision support, such as use of treatment guidelines or consulting with the expert-were found to be the ways in which mental support was incorporated in the physical care of diabetic adult patients. Incorporation of financial, social, and emotional needs as part of primary care was also effective. The two elements; (Linkages to community resources and health care organization support) were not common.

Evidence suggested that when mental health is detected and treated, symptoms subside, cognitive and behavioral functioning and overall quality of life improves. With the assistance of integrated care in medication adherence evidence shows that simple yet effective programs can help in improving adherence. Conducting integrated care intervention based on integrated care framework helps participants recognize depression in the context of Type 2 Diabetes. The outcomes are assessed using standard laboratory tests to measure glycemic control and the Center Epidemiologic Studies Depression Scale (CES-D) to assess depression. The creation and dissemination of frameworks that incorporate financial, social and emotional needs into care for Type 2 Diabetes and depression care will also enhance medical adherence. Interactive, monitoring and good follow up with patients can help in the adherence of medications for diabetic patients.

Keywords: Integrated healthcare, Type 2 diabetes, mental health, medication adherence

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1 Introduction

Healthcare is changing, so are the global health systems. The challenges of rising healthcare costs, rapid technological change, emergence of new diseases and new disease patterns, demographic shifts and dynamic lifestyles has forced policy makers and healthcare providers to device new ways of delivering economic benefit to their customers (Amelung, Stein, Balicer, Nolter and Suter 2017, 7). As the quest for better and affordable healthcare gains momentum, healthcare providers are investing in new ways and technologies to enhance care delivery. They minimise system waste, promote health-related behaviour change, and increase patient access to care, widen dissemination of health information, encourage informed decision-making and broaden the implementation of efficacious programs. Member states of World Health Organization (WHO) in the European region in 2012, endorsed the European Health Policy Health 2020. This action was a result of the recognition that health system strengthening was one of four important action areas needed to improve the health potential in that region. (World Health Organization 2016.)

Chronic disease is a global concern. WHO defines chronic conditions as health problems that persist across time and require some degree of healthcare management, they include; diabetes, heart disease, depression, schizophrenia, HIV/AIDS, and ongoing physical impairments. Chronic disease are the leading cause of death in the whole world, leading to 60% of all annual deaths. (WHO 2016.)

Non-communicable diseases or chronic diseases remains unacceptably high. They were responsible for 41 million of the world's 57 million deaths a total of 71%. 15 million were premature deaths between the ages of 30 to 70 years. Low-and middle- income countries had the highest burden, where 78% of all deaths were caused by chronic diseases and 85% of premature deaths occurred. Risk of premature death from one of the four main non-communicable chronic diseases (cardiovascular diseases, cancers, diabetes, and chronic respiratory diseases) has declined to 18% in 2016, a reduction of 6% from 2010. (WHO 2018.)

The World Health Organization (WHO) reports diabetes as one of the non-communicable chronic diseases that causes premature deaths globally. According to the World Health organization report of 2016, the state of diabetes has increased globally in the adult population nearly by a double since 1980. In 2014, it was estimated that about 422 million adults were living with diabetes globally and it caused 1.2 million deaths in 2012. Majority of the people with diabetes have type two diabetes. (WHO 2016.)

Non-adherence to medication is a global problem, approximately 50% of patients do not take their prescribed medication (Brown & Bussell 2011). This study focuses on medication adher-

ence and the mental health of the patients which are common problems. Most of these problems are linked, therefore the authors analysed how to give a holistic care by integrating the mental health and physical health of the patient.

A research conducted in 2016 in Finland concluded that, the complication of persons with diabetes has improved between 1996 and 2011 due to the prevention of major complications and also active treatment of risk factors like cardiovascular diseases. The results also suggests that the regional differences exist especially in the primary care which is mostly responsible for the management of diabetes and its prevention of complications but on a more national level the prevention of complications has become uniform throughout the country. (Manderbacka, Arffman, Lumme, Lehtikoinen, Winell and Keskimäki 2016). Hence this review is targeted to diabetic persons on a more regional level and how to care for them with integrated care and also focuses on the merging of mental health and physical health.

2 Diabetes

Diabetes is a complicated, chronic disease that includes a group of conditions that result from impaired production or effectiveness of insulin. According to Mcbain, Mulligan, Haddad, Flood, Jones and Simpson (2016), diabetes is one of the most common long-term conditions affecting millions of people globally. When diabetes is not managed properly, people can develop severe life-threatening complications. Healthcare providers have developed patient education programs to assist people to self-manage their diabetes, and to reduce the likelihood of complications. There are about 60 million people with diabetes in the European Region, equivalent to 10.3% of men and 9.6% of women aged 25 years and over.

Globally, 3.4 million people die yearly. Majority of these deaths occur in low- and middle-income countries, and majority are people who are under the age 70 years. World health organization visions diabetes deaths will double between 2005 and 2030. Prevalence of disease differ by ethnic group: type 2 diabetes is up to six times more common in people of South Asian descent and up to three times more common among those of African and African-Caribbean origin. (WHO 2018.)

2.1 Diabetes in Finland

In Finland, a country of about 5.5million, about 50,000 people have type one diabetes. About 300,000 have type two diabetes and the number of undiagnosed cases of people with type two diabetes have been estimated to be 150,000 (Finnish diabetes association 2018). The Finnish Diabetes Association (FDA) is a national patient health and public organization

founded in 1955. (FDA 2018). The main task of the FDA is to support people with diabetes to prevent further complications and improve patient care. The FDA provides counselling and courses for diabetics and their family members and also healthcare personnel year round. It also helps in enhancing diabetes related skills and contributes to the development of new approaches to diabetes care and patient education. (FDA 2018.)

2.2 Medication adherence

Medication adherence is defined as the extent to which patients follow the instructions they are given for prescribed treatments. “The WHO further defines adherence to long-term therapy as the extent to which a person’s behaviour taking medication, following a diet, and/or executing lifestyle changes”. (Brown & Bussell 2011; WHO 2003). There is however a difference between adherence and compliance. The difference being that adherence requires the patient’s agreement to the recommendations suggested by the healthcare provider whereas compliance implies patient’s passiveness to recommendations. (Brown & Bussell 2011). The WHO mentions patient related factors as one of five (5) major multifactorial causes for non-adherence. Lack of involvement in the patient treatment decision-making process is one of several patient related factors that decreases medication adherence in patients with diabetes. (Brown & Bussell 2011).

According to Cadena, Arnal, Lopéz and Jap (2012) patients diagnosed with chronic diseases like diabetes type 2 will have crisis in the beginning of diagnosis and throughout treatment as the sudden change of lifestyle may cause stress, leading to the mental disorder of the patient. This can cause lack of medication adherence and recommended preventive measures put in place by the healthcare team to prevent complications of diabetes. Different studies has shown the relationship between medication adherence, stress and metabolic control. (Cadena et al. 2012)

2.3 Mental health and physical health

Diabetes diagnosis can cause stress, which in turn may affect the psychological state of the patient and his level of adherence to medication and recommendations leading to further complications (Brown & Bussell 2011). Mental health must be treated with equal intensity as physical health but that is not always the case as mental health is mostly under recognised or unaddressed (Sullivan & Wahler 2017.) Though effective interventions and supportive psychotherapies for the medically ill exist, anxiety and depression in diabetes population is mostly under-recognised and under treated in primary care (Katon, Lin, & Kroenke 2007). The care

of patients with multiple chronic diseases accounts for the majority of healthcare costs, effective approaches to managing such complex care in primary care are needed, particularly when psychological and physical disorders coexist. (Katon, Lin, Von Korff, Ciechanowski, Ludman, Young, Peterson, Rutter, McGregor and McCulloch 2010). Reports have indicated the improved outcomes in the collaboration of mental health and physical health that is care that collaborates among primary care practitioners and mental health specialists. (Chan, Gagliardino, Baik, Chantelot, Ferreira, Ilkova, Ramachandran and Aschner 2009; Fisher, Chan, Nan, Sartorius and Oldenburg 2012.) Even though policy makers and researchers do agree that merging mental health and physical health is beneficial in improving patient care, little has been done to implement this. This is because of the multiple barriers from attitudes and customs to practices and fiscal policy. (Sullivan & Wahler 2017.)

Despite the potential adverse effects of mental health problems on diabetes outcomes and healthcare expenditures, only about one-third of patients with these coexisting conditions receive a diagnosis and treatment. (Ducat, Philipson and Anderson 2015.) According to current American Diabetes Association standards of care, people with diabetes should receive medical care from a team that may include physicians, nurse practitioners, physician's assistants, nurses, dietitian, pharmacists, and mental health professionals with expertise in diabetes. It recommends that physicians should routinely screen for any psychosocial problems like depression and diabetes-related distress, anxiety, eating disorders, and cognitive impairment. (American diabetes association 2017). Although, the American Diabetes Association have recommended integrated delivery of mental health with diabetes care, best-practice models for such care remain undefined (Anderson, Horton, O'Toole, Brownson, Fazzone and Fisher 2007). Very few diabetes clinics do provide mental health screening or integrate mental or behavioural health services in diabetes clinical care.

Strategies for implementing integrated care must be considered in a populations that is in need of chronic health care, including individuals who have more moderate psychiatric issues. Research evidence has shown that in the current structure of primary care, detection rates of mild or moderate psychiatric issues are low and therefore support for effective treatment is limited.

2.4 Integrated health with chronic care model

A plethora of different terms have been used in connection with integrated care. "Collaborative care, "coordinated care", "managed care" are some of the few names used in replace of integrated care and this is because of the different meaning of objectives that stakeholders in

healthcare systems attribute to the term. (Amelung et al. 2017). For this article, the definition from WHO was used in defining this term. World Health Organization has 3 principal definitions for integrated health care. (WHO 2016.)

In the first (1) definition it is more if the coordination of care that is primarily bound with the scope of health care. Definition two (2) is also more centered on patients who decide the integrated care strategies themselves, giving the people more control for delivering the services. This principle is used by the Government of England as part of its integrated care strategies. Definition three (3) also is more of a health system perspective and which recognizes that integrated healthcare is achieved through the healthcare systems alignment. (WHO 2016). The table below shows the definitions.

Process based definition	A user led definition	A health system led definition
<p>“Integration is a coherent set of methods and models on the funding, administrative, organizational, service delivery and clinical levels designed to create connectivity, alignment and collaboration within and between the cure and care sectors. The goal of these methods and models is to enhance quality of care and quality of life, consumer satisfaction and system efficiency for people by cutting across multiple services, providers and settings. Where the results of such multi-pronged efforts to promote integration leads to benefit for people, the outcome can be called integrated healthcare. (WHO 2016).</p>	<p>“My care is planned with people who work together to understand me and my career(s), put me in control, coordinate and deliver services to achieve my best outcomes” (WHO 2016)</p>	<p>“Integrated health delivery is defined as an approach to strengthen people-centred health systems through the promotion of the comprehensive delivery of quality services across the life-course, designed according to the multidimensional needs of the population and the individual and delivered by a coordinated multidisciplinary team of providers working across settings and levels of care. It should be effectively managed to ensure optimal outcomes and the appropriate use of resources based on the best available evidence, with feedback loops to continuously improve performance and to tackle upstream causes of ill health and to promote well-being through intersectoral and multisectoral actions. (WHO 2018.)</p>

Table 1: Three integrated health definition WHO (2016)

In this integrative literature review, the third principle definition was used as this review is focused on how healthcare systems can coordinate together to bring the best possible healthcare delivery to the patient. This integrative study is focusing on introducing healthcare services of diabetes patients successfully integrating mental and physical care to improve the medication adherence.

Chronic care model (CCM) (Grover & Joshi 2015) will be used to reinforce the concept and understanding of integrated health care. CCM is a model of care design. It provides guidance for shift from an acute, episodic health system focus to one that is required for effective chronic disease care. “The model argues that real improvement in outcome will occur only when clinical systems reconfigure themselves specifically to address the needs and concerns of chronically ill patients. It implies to a broad range of chronic illnesses and serves as a road for physicians to organize their practices to meet the complex needs of chronically ill people. It provides a proactive; patient-centred, evidence-based approach”. (Grover & Joshi 2015). They also suggest that in this model, there are six major elements that interact to promote high quality care for patients with chronic illnesses. They include: health system or a health organization, decision support, delivery system design, self-management support, clinical information systems, community, resources and policies for patients.

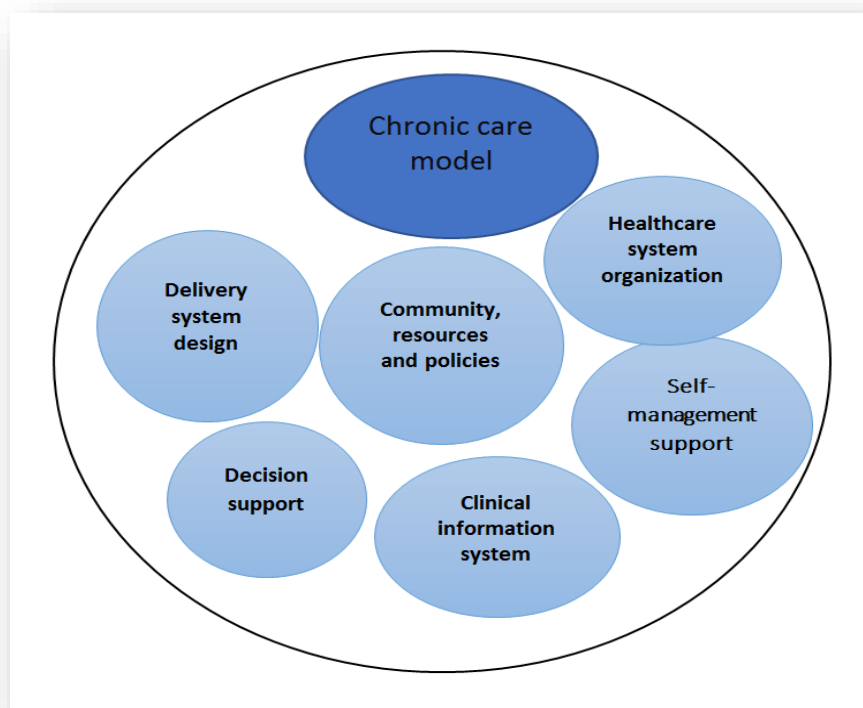


Figure 1: The six major elements of the chronic care model (Gee, Greenwood, Pater-niti, Ward and Soeder-berg 2015)

3 Goals, aims and research questions

The goal of this integrative literature review is to increase awareness of holistic approach in integrated healthcare for adult diabetic patients. The aim is to introduce healthcare services

of diabetic patients successfully integrating mental and physical care to improve the medication adherence. The research questions of this study were:

- 1 How can mental support be incorporated in the physical care of diabetic adult patients?
 2. How does integrated care assist diabetic adult patients in medication adherence?
- 4 Developing the holistic care of diabetic patients by integrative literature review.

The study idea started in September of 2017, with the initial thought of doing a literature review. It started with looking for an appropriate topic that needed to be developed in the wound care department in one of the local university hospitals. It was realized, there was very little material related to the topic the authors wanted to write making it very challenging. The topic of integrated healthcare for diabetic patients was a realistic issue in the skin and wound care of the local university hospital and was then appropriate to research about it. Statistics was collected from the Finnish Diabetes Association website, World Health organization (WHO) databases.

The initial purpose of this study was to support the magnet hospital project in skin and wound ward, but the focus was changed to integrated health care. A visit was made to the ward in September 2017 and a meeting was conducted to gain some knowledge about the ward's situation and the problems they were facing. The problems faced in the ward were: lack of mental health support and how to recognize it, social problems of the patients; they gave an example of unhygienic homes, medication and treatment adherence problems; depressed patients adhered less to medication and counselling. However, the topic was focused on integrated healthcare due to the lack of resources in English speaking nurses. This study still supports wound and skin wards to improve their treatment and to gain new knowledge. Integrated healthcare model was introduced as part of the studies and it caught the authors' attention due the holistic aspect of the model as it treats the patient as a whole taking into consideration physical, psychological, financial and most importantly the mental health status

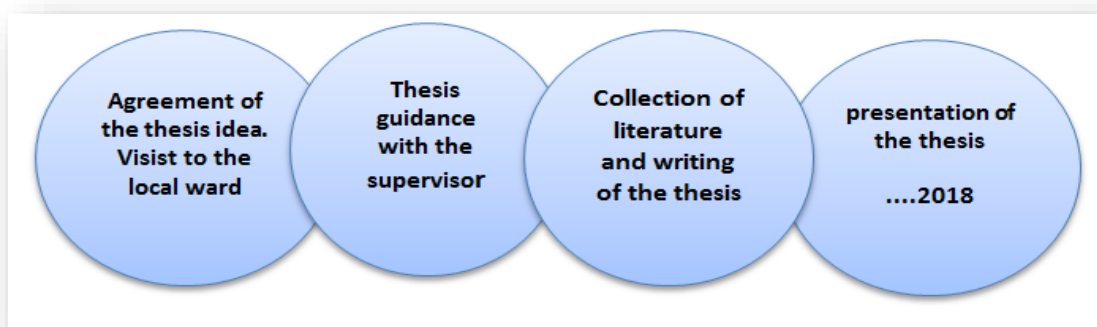


Figure 2: The stages of the Implementation of this development thesis

of the patient and not merely the clinical aspect. The first draft of the thesis was presented in January 2018, and the research topic had to be made. The second draft was presented in April 2018 and a constructive feedback was given on how to proceed. The initial patient group were older diabetics, but this changed to focus on working age groups that is adults whose ages ranged between 18 years to 65 years who have diabetes type two. Scientific evidence-based literature was used in the gathering of information.

4.1 Integrative review as a research method

(Richard 2005) defines integrated literature review as a form of research that reviews, critiques, and synthesises primary literature on a topic in a holistic way such that new frameworks and perspectives are developed.

Integrative literature review was chosen as the review method to address the problem because rarely do reviews examine all aspects of previous research but rather this lens directs the author and the reader to specific aspects of previous research that are critically examined and evaluated. As a result, the review "tells a story" by critically analysing the literature and arriving at specific conclusion about it. Integrative literature review was chosen as the appropriate approach because an updated integrative method has the ability to allow for numerous primary research methods to become huge part of evidence-based practice, (Whittemore & Knafel 2005). Furthermore, it allows for the mixing of diverse methodologies such as, experimental and non-experimental research and has a bigger role in evidence-based nursing.

The PICO-model defines the patient group (P), the adult diabetics as healthcare service users. The outcome (O) medication adherence, interventions (I) integrated care.

P= Patient group= diabetic adult patients

I=interventions = integrated care

C= context = holistic care of adult diabetic patients.

O=outcome = medication adherence

Integrative literature review was performed in order to find out effective integrated healthcare programs that have worked in taking care of adult diabetic patients.

Recent evidence based practice initiatives has increased the momentum for the need and production of every types of reviews of the literature including integrative reviews, qualitative reviews, systematic reviews and meta-analyses (Russell 2005). Integrative literature review is distinctive form of research that generates new knowledge about the topic reviewed. It allows for the mixing of diverse methodologies such as, experimental and non-experimental research and has a bigger role in evidence-based nursing. The integrative literature review has many benefits to the reviewer like evaluating the strength of the scientific evidence,

identifying gaps in current research, identifying the need for future research, bridging between related areas of work, identifying a theoretical or conceptual framework, exploring which methods have been used successfully.

Strategies to overcome threats to validity must be considered. The methodology of integrative research must have detailed and thoughtful work, the outcome of which can be a vital contribution to a particular body of knowledge and, consequently, to practice and research.

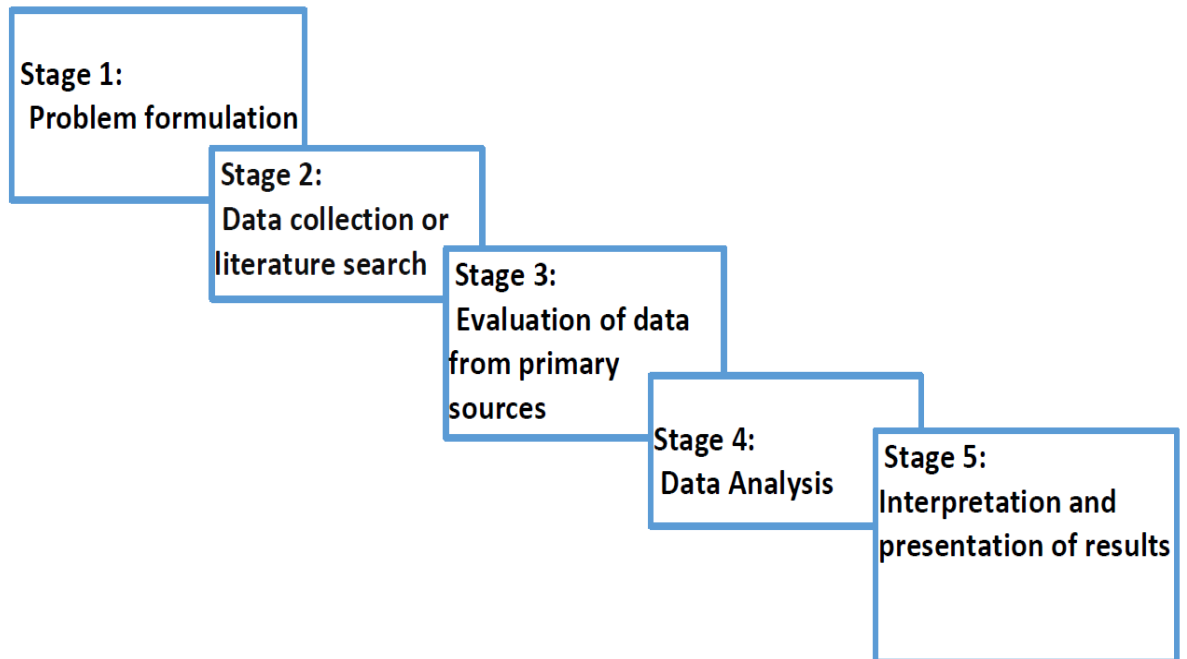


Figure 3: The five stages of integrative literature review adapted from (Whittemore et al. 2005) modified by the authors

4.2 Data search and review

The search terms in table 2 were determined by existing literature and also with consultation with the school librarian. The search terms were used using boolean operators: "AND" or "OR" to perform the search. The authors also consulted with the school librarian and after a thorough consideration, five databases were chosen for the data search, PubMed, Cinahl, Cochrane, Elsevier and ProQuest central. (Table 3). To ensure reliable data search, each author made a separate search, then they did the search together. There was no limitation on the year of the articles used. Books and articles related to integrated health care, adult diabetics was used in the writing of this review. The table below shows the inclusion and exclusion criteria.

Only english literature	Other languages
No limit on publication year	
Scientific research articles	Non scientific research article
Peer reviewed journals and articles, original publication, books	Newspaper
Contents focusing on integrated/holistic/collaborative/seamless/managed/coordinated care	Does not include integrated/holistic/collaborative/seamless/managed/coordinated care.
Contents focusing on diabetic adults	Non diabetic adults
Adults (18-65 years)	Children

Table 2: Inclusion and exclusion criteria

Cinahl	Cochrane	ProQuest central	Elsevier	Pubmed
Integrated healthcare Diabetes mellitus Mental health Diabetes mellitus type 2 Depression	Integrated healthcare for diabetics	Integrated healthcare & diabetics	Integrated healthcare and diabetes mellitus Mental health	Integrated health Diabetes Mental health Medication adherence

Table 3: Search terms for databases

4.3 Data search process

The data search identified in total 2,095 references. After removing duplicates, 1,458 potential references were left for screening. First, the titles and abstracts were screened for rele-

vance, first individually then by both authors which led to the reduction of the number of references to 54. Full text of the 54 references were reviewed, further narrowing the selection to 39 references. (Figure 4). In the last step, articles were assessed for inclusion and exclusion criteria, as well as the quality according to STROBE and CASP criteria. (STROBE 2018; CASP 2018). After the review process, in total 10 references were included in this study. The references of the articles were stored in google docs which allowed access to both authors. Suitable assessment tools for the articles were chosen by both authors. Differences in scoring were also resolved mutually. After a mutual discussion, in October 2018, the final references were decided. No articles were removed because of the low quality. The most frequent reasons for rejecting the articles were that they were a duplicate of an article found in another database or the topic was not the focus of this review.

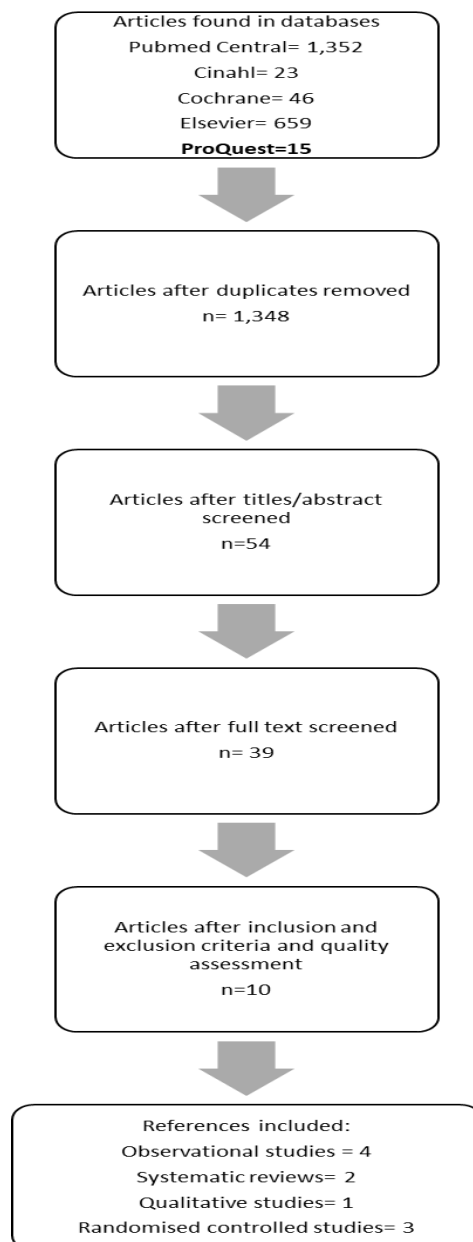


Figure 4: Prisma flow diagram of the article search for integrated care (Prisma 2015)

4.4 Quality assessment

Ten (10) articles with various designs were included. Critical Appraisal Skills program (CASP) for cohort and qualitative studies and STROBE was used to evaluate the quality of the chosen articles for the integrative review. The critical appraisal Appraisal Skills Program (2018) tools are designed to assist readers of research studies in finding and evaluating the evidence. The main purpose of quality appraisal is to identify the strength and weakness of a research study to determine which study should be included or excluded. The goal of critically appraising articles is to evaluate the quality of studies and degree of evidence in unbiased and transparent way. CASP has several checklists for different study designs and the checklists were originally developed to be used as educational pedagogic tools. (CASP 2018).

Checklist (A) applied from STROBE web pages was used for assessing the quality of observational studies (Appendix 2). Checklist (B) applied from CASP web pages was used for assessing the quality of qualitative studies (Appendix 3). Checklist (C) applied from CASP was used for assessing the quality of randomised control trial (Appendix 4), while Checklist (D) applied from CASP was used for assessing the quality of the selected systematic studies (Appendix 5). The appraisal forms for cohort, systematic and qualitative studies have 12 and 10 questions, observational studies have 22 questions. Each question is answered 'yes', 'can't tell', and 'no'. The authors assigned numeric values to each answer as 'yes=2', 'can't tell=1', 'no=0' to systematically summarise the quality of each studies. The role of the screening questions are to appraise the suitability of the research question, appropriateness of methodology, sample recruitment, presence of ethical consideration of confounding factors, follow-ups of subjects, rigor of data analysis, precision and usefulness of results, and implication for practice. Scoring is commonly used in quality assessment checklists. The quality of observational studies (n= 4), was high, scoring from 36 to 39 out of a total score of 44 (appendix 2). The quality of qualitative study (n=1), was also high scoring 16 out of 18 (appendix 3). The quality of randomized control trials was high (n= 2). The two articles each scored 21 out of 22 max (appendix 4). The quality of the selected systematic studies was high (n= 2), 15 out of 18 and 16 out of 18 (appendix 5). Thus increasing the strength of this literature review.

4.5 Description of the included studies

Of the Ten (10) included original articles, four (4) were observational studies, one(1) qualitative study, three(3) randomised control studies and two (2) systematic reviews. All of the studies were conducted between 2009-2016 (n=10). The settings of the studies were all in Western countries: United States of America, (n=6), Finland (1), United Kingdom (n=1), Netherlands (n=1), Australia (n= 1). Three (3) studies were included even though they did not meet the age limit of the diabetic patients for the inclusion and exclusion criteria, they however met other criteria and had relevant results. The studies were: (Manderbacka, Jokela, Sund and Elovainio 2014; Bogner and De Vries 2010; Watson & Pignone 2003).

4.6 Data analysis

Data analysis was performed using the five-stage methodology as described by Whittemore and Knafl (2005). The first stage involved extraction of similar data from primary articles, where both authors read the articles and underlined and highlighted sentences that answered the research questions. The second phase was data reduction whereby study was read twice to ensure identification of hidden topics for analysis and also characteristics of the included studies was assessed. More of the data was reduced as there was more evidence from the primary articles. The third phase was data display stage whereby data was arranged into common themes and articles were compared by characteristics and findings. A data sheet was created to group common themes and findings. The fourth stage was data comparison whereby the data was examined to identify patterns and relationships. It involved noting patterns and themes, making contrasts and comparisons, and identifying common patterns. In the fifth and last stage, results was drawn from the commonalities and differences from the data display sheets that was created. Results were revised continually before making conclusions. The authors also compared the results of data analysis to the primary data before writing the results for verification (Figure 5).

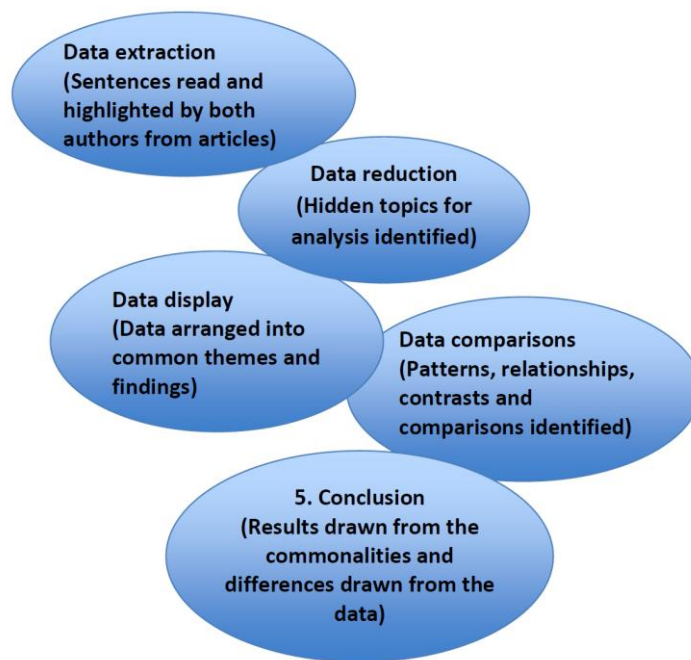


Figure 5: Integrative data analysis process adapted from Whitemore and Knafl (2005) modified by the authors

5. Results

When mental health is detected and treated, symptoms subside, cognitive and behavioral functioning and overall quality of life improves. (Watson et al. 2003). Strategies for implementing integrated care must be considered in a population that is in need of chronic health care, including individuals who have more moderate psychiatric issues.

From the data collected mental support can be incorporated in the physical care of diabetic adult patients. Several studies have shown different ways of incorporating mental health support to diabetic patients (Loraine, Katrien, Anna and Bert 2015; Doherty, Gail and Ismail 2015; Stellefson, Dipnarine and Stopka 2013; Manderbacka, Jokela, Sund and Elovainia 2014; Orman, Clarke, Whittle, Anoneuvo and Proudfoot 2016; Azrin 2014). From very simple care programs to large scale integrations. Some used basic questionnaire to assess patient's level of mental health in the primary care level. (Watson et al. 2003; Loraine et al. 2015; Stellefson et al. 2013). Majority of the articles incorporated patient education, information technology such as records of patients' data, internet, and clinical guidelines in an effort to support mental and physical health of diabetic patients. (Loraine et al. 2015; Doherty et al. 2015; Stellefson et al. 2013; Manderbacka et al. 2014; Orman et al. 2016; Azrin 2014).

5.1 Incorporating mental health in physical health

Dutch integrated care for diabetics in the Netherlands (Loraine et al. 2015) involved care groups, bundled payments, patient involvement, health professional cooperation and task substitution, evidence-based care protocols and shared clinical information system. In the United Kingdom (Doherty et al. 2015) general practitioners and other primary care staff referred patients directly or through the community or hospital teams for intensive diabetes management after patients completed a simple referral form. This led to the identification of hidden psychological and/or social problems and poor glycemic control. The approach resulted to reduced psychological distress, increased medication adherence, improved quality of care and reduced short and long term healthcare costs. In another study conducted in the United Kingdom (Stellefson et al. 2013) found evidence that Chronic Care Model approaches have been effective in management of diabetes in US primary care settings. Organizational leaders in the healthcare systems pioneered system level reorganizations that improved the coordination of diabetes care. Disease registries and electronic medical records were used to establish patient-centered goals, monitor patient progress, and identify lapses in care. Primary physicians were trained to deliver evidence-based care (occurring in an outpatient setting) in a diabetes self-management education program which improved patient outcomes. In a study done in Finland Manderbacka et al. (2014), research findings supported the common cause hypothesis that treatment for diabetes is beneficial to the prevention of depression as opposed to the ascertainment hypothesis that individuals with diabetes have greater rates of depression because they get more medical attention in general.

5.1.1 Social component to be included in integrated care

In a study conducted in the United Kingdom (Doherty et al. 2015) they described the importance of integrating the patients' social support in the care plan and recommended that it should be included in the framework of the care plans for diabetic adult patients. Social support is commonly defined as a perception that one is accepted, cared for, and provided with assistance from certain individuals or a specific group or the realization of actual support received from one another. A review of the literature concluded that increased social support is associated with improved diabetes self-management, medication adherence, and adoption of nutritional and active lifestyles. Bogner & De Vries (2010); De Vries McClintock et al. (2016), used integrated approach to Type 2 Diabetes and depression care by employing patient prioritized approach. This approach identified and incorporated financial, social, and emotional needs as part of primary care treatment discussions and decisions was successful in improving adherence and glycemic control.

5.1.2 Technology in integrated health care

Online healthcare has been shown to be equally effective as face-to-face care. A study done in Australia, an e-mental health tool was developed for diabetics with mental illness (Orman et al. 2016). This e-mental health online program was created specifically for diabetic patients to bridge the gap between the lack of general practitioners and the lack of time that should be allocated to patients. As technology is advancing especially in health care, this research shows that the internet could prove to be a very valuable tool in improving access to mental support. (Orman et al. 2016). This tool is particularly helpful as it is specifically tailored to diabetic patients, as the software program was created using data collected by a team of mental health researchers. The program reduces the problem of lack of staff and time needed to properly support patients. It is beneficial in that patients can access this programme at anytime and anywhere when they are most in need of it without having to book an appointment or wait in queue to be attended to. The e-mental health tool which is called "mycompass" is designed for patients with mild to moderate level of depression, anxiety or stress. The module consists of three 10-minute sessions, each of which includes written information, interactive skill-building exercises, vignettes and home tasks. The module takes users through identification of important life domains and values, goal-setting techniques and identification and management of obstacles to goal achievement. (Orman et al. 2016).

5.2 Integrated health and medication adherence

Integrated care does assist diabetic adult patients in medication adherence (Watson 2003; Bogner 2012; McClintock 2016). When mental health is detected and treated, symptoms subside, cognitive and behavioral functioning and overall quality of life improves. (Watson et al. 2003). A randomized research trial conducted to prove the effectiveness of whether a simple integrative care program with diabetes type 2 and depressed patients could be effective. The results after 12 weeks showed that there was an increase in oral medication adherence which led to controlled glucose level and fewer depressive symptoms. (Bogner et al. 2012). In another study conducted by Bogner et al. (2010), it was found that integrating depression treatment into the care for Type 2 diabetes mellitus among older African-Americans improved medication adherence, glycemic control, and depression outcomes. An integrated care intervention was conducted based on integrated care framework in which an integrated care manager collaborated with physicians to help participants recognize depression in the context of Type 2 Diabetes. They offered guideline-based recommendations, monitored adherence and clinical status, and provided appropriate follow-up. The intervention was presented to patients as a supplement to, rather than a replacement for, existing primary care treatment. Adherence was assessed at baseline, 2, 4 and 6 weeks using the medication Event Monitoring Systems (MEMS) to assess adherence. Outcomes assessed at baseline and 12 weeks included

standard laboratory tests to measure glycemic control and the Center Epidemiologic Studies Depression Scale (CES-D) to assess depression. They went on to stress the fact that primary healthcare setting is vital for the identification and treatment of diabetes and co-morbid mental disorders. De Vries McClintock et al. (2016), found that integrated approach to Type 2 Diabetes and depression care was successful in improving adherence and glycemic control.

The reason being that a patient might develop depression due to lack of proper social, financial and psychological needs thus resulting to medication non adherence. Medication Event monitoring system was used to monitor medication adherence. The intervention was brief, did not require high level of expertise, and was adaptable to community-based primary care settings with patients from vulnerable populations and minorities. The authors based on their findings called for the creation and dissemination of frameworks that incorporate financial, social and emotional needs into care for Type 2 Diabetes and depression care.

6. Discussion

Evidence shows that there are many possible ways to integrate mental health into the physical care of diabetic adult patient. According to Coleman, Austin and Wagner (2009), greatest improvement in health outcomes were met through: increasing provider's expertise and skill, educating and supporting patients, making care delivery more team-based and planned, making better use of registries based information systems including computer based reminders. Four of the six elements of chronic care model: (Patient self-management support to assist patients to take active role in their care, clinical information systems, such as provide feedback and electronic registries and delivery system design to support prevention oriented clinical care and provide decision support, such as use of treatment guidelines or consulting with the expert were common among reviewed articles while the two elements (Linkages to community resources and healthcare organization support) were not common. These elements worked together to strengthen the provider-patient relationship and improve outcomes. The authors from the articles reviewed recommended that primary care staff refer patients directly or through the community or hospital teams for intensive diabetes management after patients completes a simple referral form. This will lead to the identification of hidden psychological and/or social problems and poor glycemic control. The approach according to evidence results to reduced psychological distress, increased medication adherence, improved quality of care and reduced short and long-term healthcare costs.

Evidence from the article also revealed that barriers and facilitators to the implementation of integrated healthcare exists. Studies conducted in the Netherlands (Loraine et al. 2015) described barriers to the implementation of integrated care and they included: "Insufficient

integration between the patient database, decreased earnings for some health professionals, patients' insufficient medical and policy-making expertise, resistance by general practitioner assistants due to perceived competition, too much care provided by practice nurses instead of general practitioners and the funding system incentivising the provision of care exactly as described in the protocols. Facilitators included performance monitoring via the care chain information system, increased earnings for some health professionals, increased focus on self-management." Identifying barriers and facilitators is essential in assisting healthcare providers when creating guidelines and recommendations. It will also assist policy makers in making decisions and policies concerning integrated health care.

6.1 Strengths and limitations

The strength of this study is that it represents the integrated care models that have been used globally. There was only one research article that was done in Finland thus this information is important for the development of local services in Finland. The study examined two competing hypotheses concerning the association between diabetes and treatment for depression: (1) the ascertainment bias hypothesis suggesting that those with diabetes are more likely to be diagnosed with and treated for depression (Manderbacka et al. 2014). It did not provide direct answer to this review thus this review has played a role in identifying this gap. The inclusion and exclusion criteria was wide and allowed different study designs which led to the identification of broad and all inclusive data. The quality of the articles were assessed with relevant assessment tools. The authors also merged data from different types of study designs as mentioned earlier thus increasing the strengths of this review. This literature review has its limitations. The inclusion criteria were limited to studies published in English language which leads to publication bias. The publication bias may have excluded some evidence which could have increased the reliability of this review.

6.2 Ethical consideration

This study was a theoretical study, therefore there was no ethical approval needed for this study. To conduct an ethical literature review, authors have certain responsibilities that they need to uphold. The review must be conducted and reported in a transparent way. The conflicts of interest and fundings must all be declared. Data extraction must be accurately done, the review should not contain any plagiarised material (Wager & Wiffen 2011, 130-134) In this study there was no conflict of interest from the authors. There was no funding used in completing this study. All the materials used were read through individually and collectively to prevent bias in collecting information and to ensure that both authors have the same understanding of the articles used. In cases where there was any disagreements or differences

in opinions there was compromises made by discussing and settling the situation. Collecting of the research articles was done with the help of a professional librarian. References used in this article were written to prevent plagiarism.

7 Conclusion

Persons who have primarily medical issues, in this case diabetes but develop mental health issues as their illness progresses are in need of integrated care. Evidence suggested that when mental health is detected and treated, symptoms subside, cognitive and behavioral functioning and overall quality of life improves. With the assistance of integrated care in medication adherence evidence shows that simple yet effective programs can help in improving adherence. Conducting holistic care intervention based on integrated care framework in which an integrated care manager collaborates with physicians to help participants recognize depression in the context of Type 2 Diabetes is emphasised. The latter offers guideline-based recommendations, monitor adherence and clinical status, and provides appropriate follow-up. The intervention is then presented to patients as a supplement to, rather than a replacement for, existing primary care treatment. Adherence is assessed using medication Event Monitoring Systems (MEMS). Outcomes is assessed using standard laboratory tests to measure glyce-mic control and the Center Epidemiologic Studies Depression Scale (CES-D) to assess depression.

The creation and dissemination of frameworks that incorporate financial, social and emotional needs into care for Type 2 Diabetes and depression care will also enhance medical adherence. Interactive, monitoring and good follow up with patients can help in the adherence of medications for diabetic patients.

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Appendix 1: Characteristics of the included studies

Reference	country	Purpose and aim of study	Study design	Data and methods	Results	Quality assessment
1 Bogner, H., Morales, K., De Vries McClintock, H., & Capola, A.2012. Integrated Management of Type 2 Diabetes Mellitus and Depression Treatment to Improve Medication Adherence: A Randomized Controlled Trial. Annals of Family Medicine, 10(1), 15-22.	United states of America	The objective of this study was to examine whether a simple, brief integrated approach to depression and type 2 diabetes mellitus treatment improved the adherence to oral hypoglycemic agents and antidepressant medications, glycemic control, and depression among primary care patients.	A randomized controlled trial using the Medication event monitoring system (MEMS) and the 9-item patient health questionnaire to assess depression.	A controlled trial of 180 patients with type 2 diabetes and depression in primary care for a period of one year. Assessment was made using the Medication event monitoring system (MEMS) and the 9-item patient health questionnaire.	Intervention and usual care groups did not differ statistically on baseline measures. Patients who received the intervention were more likely to achieve HbA(1c) levels of less than 7% (intervention 60.9% vs. usual care 35.7%; P < .001) and remission of depression (PHQ-9 score of less than 5: intervention 58.7% vs. usual care 30.7%; P < .001) in comparison with patients in the usual care group at 12 weeks.	21/22

<p>Watson, L. & Pignone, M. 2003. Screening accuracy for late-life depression in primary care: A systematic review. <i>The Journal of family practice</i>, 52(12), 956.</p>	<p>United States of America.</p>	<p>To determine the accuracy of depression screening instruments for older adults in primary care.</p>	<p>Systematic Review</p>	<p>MEDLINE, PsycINFO and the Cochrane and other database on depression, anxiety and neurosis was used. Hand-checking of bibliographies and extensive peer review were also used to identify potential articles. A predefined search strategy targeted only studies of adults aged 65 years or older in primary care or community settings, including long-term care. Articles were included in this review if they reported original data and tested depression screening instruments against a criterion standard, yielding sensitivity and specificity.</p>	<p>Eighteen articles met criteria and are included in this review, representing 9 different screening instruments. The most commonly evaluated were the Geriatric Depression Scale (30- and 15-item versions), the Center for Epidemiologic Studies Depression Scale, and the SelfCARE (D). Accurate and feasible screening instruments are available for detecting late-life depression in primary care. More research is needed to determine the accuracy of depression screening instruments for demented individuals, and for those with subthreshold depressive disorders.</p>	<p>17/18</p>
<p>Manderbacka, K., Jokela, M., Sund, R. & Elovainio, M. 2014.</p>	<p>Finland</p>	<p>This study examined two competing hypotheses concerning the association between diabetes and treatment for depression.</p>	<p>Case control study</p>	<p>The study population included all persons aged 35-65 years in Finland with any record of type 2 diabetes in the national health</p>	<p>Within the year following diagnosis diabetes, there was a 5% increase in antidepressant medication use but not in hospitalization for depression.</p>	<p>41/44</p>

<p>Treatment of depression in diagnosed diabetes: Common cause or detection bias? <i>Psychological Medicine</i>, 44(6), 1205-1212.</p>		<p>sion: (1) the detection/ascertainment bias hypothesis suggesting that those with diabetes are more likely to be diagnosed with and treated for depression because of increased medical attention and (2) a hypothesis assuming that diabetes and depression share common underlying pathophysiological pathways.</p>		<p>and population registers from 1999 to 2002 and for whom register-based data on depression treatment (antidepressant medication use and hospitalizations for depression) were available at least 2 years before and after the diagnosis of diabetes (n = 18,217). Sociodemographic data were individually linked to the study population. Associations between diabetes diagnosis and time and indicators of depression care were assessed with population-averaged multi-level logistic models.</p>	<p>The longitudinal change in antidepressant use over time was less steep after the diabetes diagnosis, and hospitalization risk decreased after the diagnosis. These associations between diabetes diagnosis and depression treatment were not modified by the participant's socioeconomic position (SEP).</p>	
<p>Azrin, S. T. 2014. Integrated care: High-impact mental health-primary care research for patients with multiple comorbidities. <i>Psychiatric services</i> (Washington, D.C.), 65(4), 406.</p>	<p>United States of America</p>	<p>Describes an approach that embraces both real-world relevance and methodological rigor to stimulate such research. The approach emphasizes generating knowledge that decision makers need, using practice-based evidence and efficient methods, and planning for sustainability and broad uptake from the outset.</p>	<p>Observational study</p>	<p>Not stated</p>	<p>A new approach to mental health-primary care research is needed to develop practical and sustainable interventions for complex patients seen in PCPs. The field should focus on flexible, integrated care models that target multiple psychiatric and medical comorbidities and are compatible with the reality of the PCP setting.</p>	<p>40/44</p>

<p>Doherty. A., Gayle. C. & Ismail. K. 2015. 3 dimensions of care for diabetes: integrating diabetes care into an individual's world. <i>Journal of psychiatry</i>, 32(9), 345-349.</p>	<p>United Kingdom</p>	<p>Aims to: (i) improve glycaemic control, (ii) reduce psychological distress, (iii) improve quality of care and patient - reported outcomes, and (iv) reduce short - and long - term health service use costs.</p>	<p>Observational studies</p>	<p>Not stated</p>	<p>Considering the high levels of social, economic and educational deprivation, the patient - led case conference was valuable in promoting self - efficacy of diabetes self - care. The 3DFD team were able to act as a support structure for subsequently integrating patients into normal diabetes services. In particular the accessibility of the 3DFD team, and the quality of communication between the team and other professionals involved in their care were noted as being important in the patients' experience.</p>	<p>40/44</p>
<p>Loraine, B., Katrien, L., Anna, H., & Bert V., 2015. Implementation of integrated care for diabetes mellitus type 2 by two Dutch care programs: a case study. <i>Journal of BMC family practice</i>. 16,105.</p>	<p>Netherlands</p>	<p>Even though previous research has demonstrated improved outcomes of integrated care initiatives, it is not clear why and when integrated care works. This study aims to contribute to filling this knowledge gap by examining the implementation of integrated care for type 2 diabetes by two Dutch care groups.</p>	<p>Observational study</p>	<p>An embedded single case study was conducted including 26 interviews with management staff, care purchasers and health professionals. The Context + Mechanism = Outcome Model was used to study the relationship between context factors, mechanisms and outcomes. Dutch integrated care involves care groups,</p>	<p>Facilitators included performance monitoring via the care chain information system, increased earnings for some health professionals, increased focus on self-management, innovators in primary and secondary care, diabetes nurses acting as integrators and financial incentives for guideline adherence. Economic</p>	<p>38/44</p>

				<p>bundled payments, patient involvement, health professional cooperation and task substitution, evidence-based care protocols and a shared clinical information system. Community involvement is not (yet) part of Dutch integrated care.</p>	<p>and political context and health IT-related barriers were discussed as the most problematic areas of integrated care implementation. The implementation of integrated care led to improved communication and cooperation but also to insufficient and unnecessary care provision and deteriorated preconditions for patient-centered care.</p>	
<p>Orman, J., Clarke, J., Whittle, E., Anonuevo, C., & Proudfoot, J. 2016. A diabetes-specific e-mental tool: Development acceptability and outcomes of a feasibility study. Australian Journal of General Practice, 4 (8) 600-605.</p>	Australia	<p>The objective of this study was to examine whether a simple, brief integrated approach to depression and type 2 diabetes mellitus (type 2 diabetes) treatment improved adherence to oral hypoglycemic agents and antidepressant medications, glycemic control, and depression among primary care patients.</p>	Qualitative study	<p>First, qualitative information was obtained from consumers and practitioners to inform module content. Second, clinical content for the module was developed, including psychoeducational material and clinical content. In the final stage, acceptability and feasibility was evaluated in a group of patients with diabetes.</p>	<p>Patients' satisfaction with and acceptance of the module was high. Significant improvement in mental health and diabetes outcomes was also observed.</p>	16/18
<p>Bogner, H., & De Vries McClintock, H. 2010. Integrating type 2 diabetes mellitus and depression treatment</p>	United States of America.	<p>The purpose of this study was to examine whether integrating depression treatment into care for Type 2 diabetes mellitus among older African-</p>	Randomized Controlled trials	<p>Older African-Americans prescribed pharmacotherapy for Type 2 diabetes mellitus and depression from physicians at a large primary care practice</p>	<p>In all, 58 participants aged 50 to 80 years participated. The proportion of participants who had 80% or greater adherence to an oral hypoglycemic</p>	21/22

<p>among Africans-Americans. Sage journal, diabetes educator 36(2) 284-292.</p>		<p>Americans improved medication adherence, glycemic control, and depression outcomes.</p>		<p>in West Philadelphia were randomly assigned to an integrated care intervention or usual care. Adherence was assessed at baseline, 2, 4, and 6 weeks using the Medication Event Monitoring System (MEMS) to assess adherence. Outcomes assessed at baseline and 12 weeks included standard laboratory tests to measure glycemic control and the Center Epidemiologic Studies Depression Scale (CES-D) to assess depression.</p>	<p>(intervention 62.1% vs. usual care 24.1%) and an antidepressant (intervention 62.1% vs. usual care 10.3%) was greater in the intervention group in comparison with the usual care group at 6 weeks. Participants in the integrated care intervention had lower levels of glycosylated hemoglobin (intervention 6.7% vs. usual care 7.9%) and fewer depressive symptoms (CES-D mean scores, intervention 9.6 vs. usual care 16.6) compared with participants in the usual care group at 12 weeks.</p>	
<p>De Vries McClintock, H.F., Boyles. K.B., Rooney, K & Borger. H. R. 2016. Diabetes and depression care: A randomized controlled pilot trial. American journal of health behaviour. 40 (4) 503-513.</p>	<p>United States of America</p>	<p>We examined the comparative effectiveness of an integrated intervention for Type 2 diabetes mellitus (T2DM) and depression by employing patient prioritized planning (PPP) to incorporate patients' financial, social, and emotional needs versus an integrated intervention alone.</p>	<p>Randomized Controlled trials</p>	<p>A randomized controlled pilot trial randomly assigned 78 patients prescribed pharmacotherapy for T2DM in primary care to an integrated intervention for T2DM and depression employing PPP to incorporate patients' financial, social, and emotional needs (enhanced intervention) versus an integrated intervention alone (basic intervention). Hemoglobin A1C (HbA1C) assays measured glycemic control and the Center</p>	<p>Patients in the enhanced intervention had a significantly greater mean change in HbA1C from baseline in comparison with the basic intervention at 12 weeks (enhanced intervention -0.63 vs basic intervention 0.15; p = .027).</p>	<p>21/22</p>

				for Epidemiologic Studies Depression Scale (CES-D) assessed depression.		
Stellefson, M., Dipnarine, K. & Stopka, C. 2013. Chronic model and diabetes management in US primary care settings: A systematic review. Centres for disease control and prevention, 10(26).	United States of America	The objective of this study was to describe how researchers have applied CCM in US primary care settings to provide care for people who have diabetes and to describe outcomes of CCM implementation.	Systematic review	We conducted a literature review by using the Cochrane database of systematic reviews, CINAHL, and Health Source: Nursing/Academic Edition and the following search terms: "chronic care model" (and) "diabetes*." We included articles published between January 1999 and October 2011. We summarized details on CCM application and health outcomes for 16 studies.	We found evidence that CCM approaches have been effective in managing diabetes in US primary care settings. Organizational leaders in health care systems initiated system-level reorganizations that improved the coordination of diabetes care. Disease registries and electronic medical records were used to establish patient-centered goals, monitor patient progress, and identify lapses in care. Primary care physicians (PCPs) were trained to deliver evidence-based care, and PCP office-based diabetes self-management education improved outcome	16/18

Appendix 2: Quality assessment of observational studies applied from STROBE statement (A)

(Cohort, cross sectional, case control)

Reference	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Observational score(max=44)
Doherty et al. 2015	2	2	2	2	2	2	2	0	2	2	2	2	2	2	2	2	2	1	2	2	2	1	40
Azrin 2014	2	2	2	2	2	2	2	0	2	2	2	2	2	2	2	2	2	2	2	0	2	0	40
Loraine et al. 2017	2	2	2	2	2	2	2	2	2	2	1	2	2	2	1	2	2	2	2	0	2	0	38
Manderbacka et al. 2014	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	2	0	2	2	2	41

Scores: 0= Do not satisfy assessment criterion 1= Partly satisfies assessment criterion 2= Yes satisfies assessment criterion

1. Study design, title and abstract are defined
2. Background of the study is explained
3. Objectives are stated including any prespecified hypothesis
4. Study design key elements are presented
5. Study settings are described
6. Eligibility criteria of the participants are described
7. Variables are defined
8. Data/sources measurement are described
9. Bias are described
10. Study size is explained
11. Quantitative variables are explained
12. Statistical methods are described
13. Number of participants (eligible and non-participation) are explained

14. Descriptive data is explained
15. Outcome data is reported
16. Main results are reported
17. Other analysis are reported
18. Key results are summarised
19. Study limitations are discussed
20. Interpretation is explained
21. Generalisability is discussed
22. Funding is reported

Appendix 3: Quality appraisal of the selected qualitative studies applied from CASP (B)

Author (Year)	Were there a clear statement of the aims of the research?	Is qualitative methodology appropriate?	Was the research design appropriate to address aims of the research?	Was the recruiting strategy appropriate to the aims of the study?	Was the data collected in a way that addressed the research issue?	Was the data analysis sufficiently rigorous?	Has the relationship between researcher and participants been adequately considered?	Have ethical consideration been taken into consideration?	Is there a clear statement of findings?	Qualitative score (Max = 18)
Orman et al. 2016	2	2	2	2	2	2	1	1	2	16

Score: 0 = No, 1= Maybe, 2= Yes

Adapted from CASP cohort appraisal tool.

Appendix 4: Quality assessment of randomised control trial applied from CASP (C)

Author (year)	Did the trial address clearly focused issue?	Was the assignment of patients treated randomized?	Were all the patients who entered trial accounted for?	Were participants "blind" to treatment?	Were the groups similar at the start of the trial?	Were all groups treated equally?	How large was the treatment effect?	How precise was the estimate of the treatment effect?	Can the results be applied to the local population?	Were all clinically important outcomes considered?	Are all benefits worth the harms and cost?	Score = 22
Bogner and De Vries McClintock 2010	2	2	2	2	2	2	1	2	2	2	2	21
De Vries McClintock et al. 2016	2	2	2	2	2	2	1	2	2	2	2	21
Bogner et al. 2012	2	2	2	2	2	2	2	2	2	1	2	21

Scores: 0 = No, 1 = Maybe, 2 = Yes

Adapted from CASP cohort appraisal tool

Appendix 5: Quality appraisal of the selected systematic review studies applied from CASP (D)

Author (Year)	Did the review address a clearly focused question?	Did the authors look for the right type of papers?	Do you think all the relevant studies were included?	Did the reviewers' authors do enough quality assessment of studies?	If the results of the review have been combined, was it reasonable?	What are the overall results of the review?	Can the results be applied to local population?	Were all the important outcomes considered?	Are the benefits worth the harms and cost?	Systematic score (max = 18)
Watson and Pignone 2003	2	2	2	2	2	2	2	1	2	17
Stellefson et al. 2013	2	2	1	2	2	2	2	1	2	16

Score: 0= No, 1= Maybe, 2= Yes

Adapted from CASP cohort appraisal tool

