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REVIEW

An Integrative Review of the Application of Orem's Self-care Nursing Theory on Type II Diabetes Mellitus Patients Self-care: An Integrative Review

Orem'in Öz Bakım Hemşireliği Teorisinin Tip II Diyabet Mellitus Hastalarının Öz Bakımına Uygulanmasının Bütüncül Bir İncelemesi

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Abstract

Diabetes incidence is rapidly increasing, and it is projected that by 2045, there will be at least 783 million individuals worldwide if nothing is done. In nursing practice, Orem's self-care theory is known to be effective in managing chronic diseases such as type II diabetes mellitus (T2DM). The purpose of this review is to examine studies on the use of Orem's self-care theory in the self-care of T2DM patients. The literature was searched from digital libraries and databases (Science Direct, EBSCO, Scopus, Springer, Wiley Online, SciELO, and Web of Science) between March and June 2023. Publications available in full text in English were used, the strength of evidence was graded in the first screening (source, level, and quality), and 13 publications were included in this review. The analyzed studies were from 8 countries, 4 (31%) of which were from Iran; most of the studies were experimental research (62%), and only one article (8%) used a case study approach. The review provides insights into the effectiveness of applying the theory but also suggests directions for further research, including addressing psychological aspects, adopting different methodologies, and using the theory in various cultural and regional contexts. This review highlights the evolving nature of the theory, which holds significant innovative potential in managing chronic diseases and offers hope and possibility for the future.

Keywords: Orem's theory, integrative review, type II diabetes mellitus, chronic disease, self-care

Öz

Diyabet görülme sıklığı hızla artmakta olup 2045 yılına kadar dünya çapında 783 milyon sayısına ulaşılabilecği tahmin edilmektedir. Hemşirelik uygulamalarında Orem'in öz bakım teorisi, tip II şeker hastalığı (T2DM) gibi kronik hastalıkların yönetiminde etkinliği bilinmektedir. Bu derlemenin amacı; Orem'in öz bakım teorisinin T2DM hastalarının öz bakımında kullanımına ilişkin çalışmaların incelenmesidir. Mart ve Haziran 2023 tarihleri arasında dijital kütüphaneler ve veri tabanlarından (Science Direct, EBSCO, Scopus, Springer, Wiley Online, SciELO ve Web of Science) literatür tarandı. İngilizce tam metin olarak ulaşılan yayınlar kullanıldı. İlk taramada kanıt gücünün derecelendirilmesi (kaynak, düzey ve kalite) yapıldı ve bu incelemeye 13 yayın dahil edildi. Analiz edilen çalışmalar 8 ülkeden olup 4'ü (%31) İran'daydı; çalışmaların çoğunu deneysel araştırmalar oluşturuyordu (%62) ve yalnızca bir makalede (%8) olgu çalışması yaklaşımı kullanıldı. İnceleme, teorinin uygulanmasının etkinliğine dair içgörüler sunar ancak aynı zamanda psikolojik yönleri ele almak, farklı metodolojileri benimsemek ve teoriyi çeşitli kültürel ve bölgesel bağlamlarda kullanmak gibi daha fazla araştırma için yönler önerir. Bu inceleme, kronik hastalıkları yönetmede önemli yenilikçi potansiyele sahip olan ve gelecek için umut ve olasılık sunan teorinin gelişen doğasını vurgular.

Anahtar Kelimeler: Orem teorisi, bütünleştirici derleme, tip II diyabet, kronik hastalık, öz bakım

Introduction

Diabetes is a form and group of metabolic diseases characterized by hyperglycemia (1) the condition is caused by either a shortage of insulin or the body's ineffective use of insulin (2). The International Diabetes Federation estimates that diabetes-related health spending globally increased from USD 850 billion in 2017 to USD 966 billion in 2021; it will reach USD 1.03 to 1.05 trillion between 2030 and 2045. Currently, diabetes affects more than one in 10 adults (20-79 years), and the list of countries with at least one in five adults affected by diabetes is increasing; the estimated prevalence of diabetes has risen from 450 million in 2017 to 537 million

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in 2021 if nothing is done to address the problem the figure will rise to 643 million by 2030 and further increase to an alarming 783 million by 2045; therefore, immediate action is needed to prevent the staggering rise in the statistics (3).

The disease affects individuals in every region, including the rural areas of low- and middle-income nations (1) in 2019, the prevalence of diabetes among adults in European Union (EU) countries was 6.2%, it increased to 9.2% in 2021 (4). The prevalence varied across EU member countries; in Cyprus, the rate of diabetes rose from 81.8 to 87.5, and the projections suggest that by 2045, the prevalence rate will reach 115.8 (5). A study conducted among elderly groups in Northern Cyprus found that more than half of the participants had diabetes (6). If diabetes is not effectively managed, there is a high chance of developing complications such as renal, cardiovascular and cerebrovascular diseases (7-11). About thirty to forty percent (30 to 40%) of individuals living with diabetes develop chronic kidney disease (CKD), and diabetes is the leading cause of CKD (12). Diabetes is a significant cause of death globally, though the death rate varies according to the region; it is estimated that over six million (6.7 million) individuals die as a result of diabetes or its complications (3). Diabetes-related mortality is rising in both developed and developing nations (13). Nevertheless, mortality was higher in middle-income countries than in high-income countries (14).

Despite the advantages of diabetic self-care, the incidence of type II diabetes mellitus (T2DM) is still out of control because patients do not have the information or support they need to follow the advised lifestyle adjustments (15). Self-care has gained significant attention in healthcare systems worldwide (16,17). Self-care was clearly defined in the late 20th century (18) and facilitated by the change in disease trends from acute to chronic conditions (19). With the increasing prevalence of chronic diseases, individuals must take more responsibility for their care (20). Some researchers suggest that people with chronic diseases can be effectively managed through self-care, mainly when nurses practice ethically (21). For individuals with chronic diseases, self-care becomes a primary form of care as they make daily self-management and treatment administration decisions (22). Competent self-management will represent self-care when patients are informed and given guidance (23,24).

Diabetes self-management is part of self-care; it is an informed, learned, objective, and practical activity and behaviour carried out in actual life situations daily (25). It involves taking responsibility for monitoring blood glucose levels, dietary adjustments, lifestyle changes, and adhering to medications (26,27). These self-care practices are crucial for diabetes management (28,29). Self-care is essential for efficiently managing diabetes, maintaining glycaemic control, maintaining a balanced and healthy life, better management of coexisting conditions, and long-term benefits, thus reducing the chance of diabetes complications occurring and improving the overall quality of life (QOL) (30,31). Some studies reported that educating individuals with diabetes on self-care helps in successfully managing individuals with T2DM (32,33), ultimately leading to better glycemic control (34). Higher education levels among diabetic patients were found to be a significant predictor of better self-care scores in a related study of self-care and T2DM management by Bukhsh et al. (35). Tharek et al. (36) revealed a relationship between greater self-efficacy, boosted self-care behavior, and improved glycemic control among respondents in Malaysia.

Orem's theory influenced nursing practice, particularly in the aspect of self-care (37). The "nest" of theories Orem found consisted of three theories: self-care, the lack of self-care and the nursing system (38,39) later, the theory of dependent care was developed and added to address the complexity of the patients and caregivers (40). Orem believes that people can care for themselves; nurses must assist patients if this is not achieved (41,42). The main assumptions of self-care nursing theory (SCNT) align with the guidelines for treating diabetic patients set forth by the American Diabetes Association (ADA) (9). Understanding Orem's theory requires grasping six key concepts: self-care, therapeutic self-care demand, self-care deficiency, self-care agency, nursing agency, and nursing system (43). SCNT clarifies how and why people practice self-care (44) and why nurses assist people through nursing (45). Orem contends that a patient's constraint on treatment determines the nursing system. Because of this, nurses provide various nursing care within the system including educational and supporting care and partial and complete care (46). The SCNT helps nurses manage patients more effectively by promoting and implementing self-care; (47) it is one of the theories that inspired nursing practice globally, especially in managing chronic diseases, of which T2DM is one. The purpose of this review is to examine studies on the use of Orem's self-care theory in the self-care of T2DM patients. The research question guiding the review includes the following:

I. What methodological approaches have researchers adopted in applying SCNT for T2DM self-care?

II. What are the characteristics of the studies that utilized SCNT for T2DM self-care?

III. What aspects of T2DM self-care and outcome measures are the published articles using SCNT focused?

Material and Method

Design

The design for this review is an integrative review in which the process permits the inclusion of numerous study types for a detailed understanding of the topic (48). In this review, the focus is on using SCNT for T2DM; the following review steps were used: spotting the related review theme, searching the databases, creating exclusion and inclusion criteria, recognizing and retrieving designated and selected studies, categorizing the chosen studies, analyzing and

interpreting data, and presenting the synthesized result of the review (48). During the review process, the preferred reporting items for systematic reviews and meta-analysis method was used (49). The integrative review's flowchart is shown in Figure 1.

Data Source

The search method utilized a variety of sources, including a digital library, the PubMed portal containing MEDLINE, and seven electronic databases (Science Direct, EBSCO, Scopus, Springer, Wiley Online, SciELO and Web of Science). During the search process, the following keywords were used: "self-care", "Orem's theory", "diabetes type II", "type II diabetes", and "nursing" in the English version. The search was performed in March and June 2023 and updated in March 2024. The studies were spotted and chosen based on the aim of the review and the criteria set by the researchers. The strategy adopted for the search of the articles ensures the selection of the articles evaluated by the researcher through the combination and analysis of the relevant keyword titles and abstracts. The selected article was then reviewed following the review guide (48).

Inclusion and Exclusion Criteria

The below inclusion and exclusion criteria were used for the selection of the reviewed articles:

Inclusion criteria: Studies on T2DM that used SCNT, articles covering the review aim and questions, articles published in English between March 2004 and March 2024, and lastly, full-text articles.

Exclusion criteria: Studies on T2DM that did not use SCNT, articles published in other languages apart from English, articles with restricted access or without access to the full text that can clarify the review aim and criteria.

Data Selection and Extraction

The two reviewers (researchers) maintained independence throughout the review process; reference management software (Endnote 21™) was used to organizes and remove duplicate studies from searched databases. Further checks and removal were independently conducted manually by the researchers. In addition, the researchers independently assessed the two stages of the review, from study selection process to data synthesis and analysis stage; disagreements were discussed, and consensus was reached. The selection process was done in two stages; the first considered titles and abstracts of all retrieved articles, while in the second stage, the full text of the potential eligible articles was retrieved and assessed based on the eligibility criteria; the two stages of selection were conducted by the two researchers independently ensuring

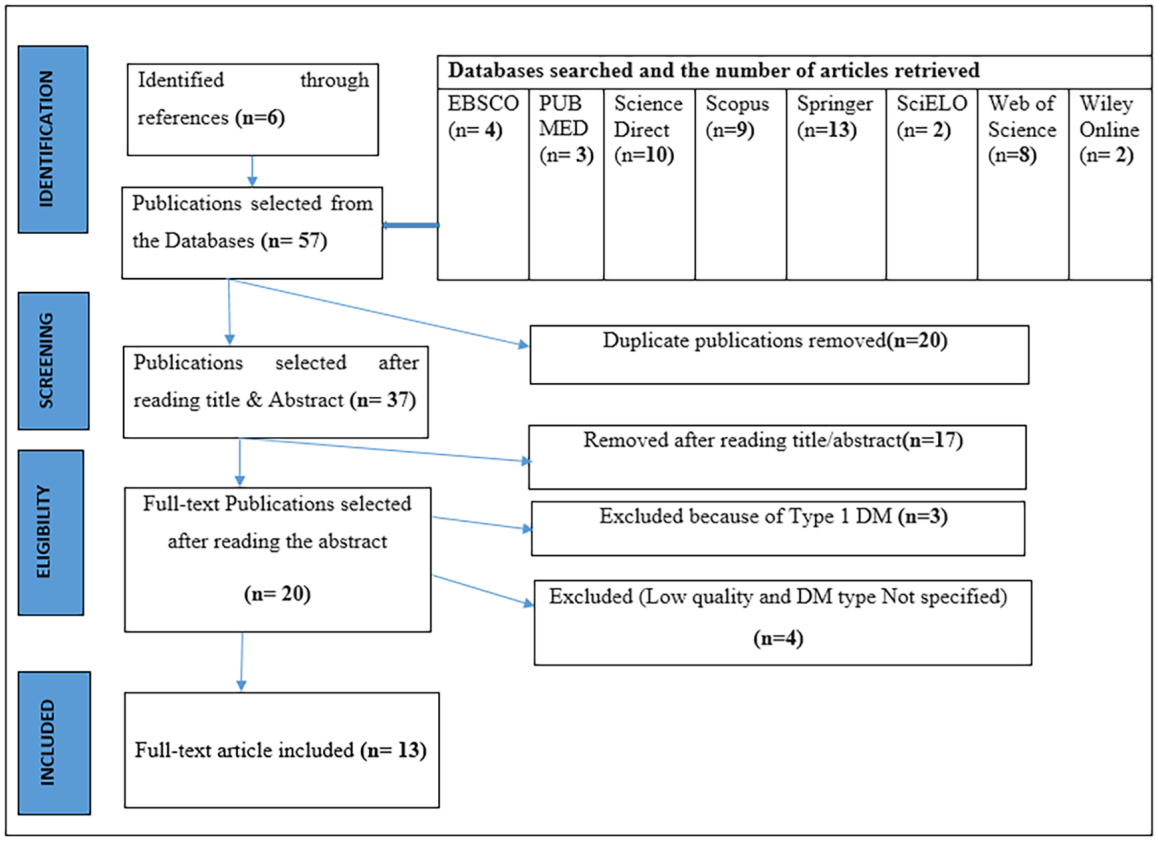

Figure 1.
PRISMA Flow Diagram for Searching and Selection of Articles
PRISMA=preferred reporting items for systematic reviews and meta-analyses, DM=diabetes mellitus

adequate considerations to potential studies, discrepancies were discussed, and agreement reached. The researchers independently extracted data from the included articles using the reviewers' standardized data extraction form to minimize bias and ensure accuracy. The extracted data included the author, year, country, purpose of the study, methodological approach, quality score/level, sample, application of the theory, and findings.

Ethical Consideration

The authors have carefully followed ethical standards, ensuring that any potential problems, including data falsification, double submission or publication, misconduct, plagiarism, bias, and redundancy, have been addressed and avoided in the review.

Sample Data Collection Tools and Quality Appraisal

The total sample used in the conduct of the review comprises 13 articles. For this review, the researchers used an integrative review tool that consists of the following guide; spotting of the article, characteristics/attributes of the research methods, evaluation/appraisal of the methodological rigor, intervention/treatment used, a case study approach and the results. The tool enables the identification of a common research language and terms among healthcare professionals and related areas that conduct research related to the review (48). The initial screening and rating of the strength of evidence (source, level, and quality) for the articles included in the review was done using the Stetler tool (50), and the researchers ensured that the articles included were within the accepted level of evidence and quality (levels I to IV) as shown in Table 1.

Results

Characteristics of the Reviewed Studies

A total of 13 publications were selected as samples for critical analysis. The 13 articles examined came from various journals, all relevant to the nursing field. All of the studies (100%) had authors who were nurses (51-63); however, four of them (31%) also had additional professionals, primarily doctors of internal medicine and endocrinology. The studies analyzed were done in 8 countries as shown in Table 1, of which 4 (31%) were in Iran, 2 (15%) in the United States, and 2 (15%) in Brazil. The remaining nations each had one publication. About the year of publication, there was only one in 2007 (8%), followed by three more in 2011, 2013, and 2015. 2018 accounted for 2 (16%) publications, while 2017 had the largest number with 4 (31%) publications. The bulk 8 (62%) of the methodological approaches as seen in Table 1, were experimental design (52-58), whereas 4 (31%) combined non-experimental techniques that emphasized correlating/description (60,61), prediction (62), and exploration (63). A case study was only employed as the research's design in 1 (8%) published paper. The case study focused on guiding patients through diabetic self-care using systematic and standardized nursing language (51). Table 1 showed more than half (62%) of the studies were interventional (52-59), addressing T2DM self-care, on the interventional studies,

Table 1.
Characteristics of the Studies Included in the Review

Author(s)/reference number	Year	Country	Methodological approach	Quality score	Application of the theory
Kumar (51)	2007	USA	Case study	Level 4	A theoretical framework to guide study
Landim et al. (52)	2011	Brazil	Quasi-experimental	Level 3	Teaching strategy
Mahmoudirad et al. (53)	2015	Iran	Quasi-experimental	Level 3	Teaching strategy
Baraz et al. (54)	2017	Iran	Quasi-experimental	Level 3	Teaching strategy
Borji et al. (55)	2017	Iran	Quasi-experimental	Level 3	Teaching strategy
Surucu et al. (56)	2017	Turkey	Quasi-experimental	Level 3	Teaching strategy
Abd El-Aal and El-Nagar (57)	2018	Egypt	Quasi-experimental	Level 3	Teaching strategy
Hemmati Maslakpak et al. (58)	2018	Iran	Quasi-experimental	Level 3	Teaching strategy
Xiaojuan (59)	2018	China	Quasi-experimental	Level 3	Teaching strategy
Compean-Ortiz et al. (60)	2013	Mexico	Correlational/ descriptive	Level 4	A theoretical framework to guide study
Unuoha et al. (61)	2017	Trinidad	Correlational/ descriptive	Level 4	A theoretical framework to guide study
Leininger and McFarland (62)	2020	USA	Correlational/ predictive	Level 4	A theoretical framework to guide study
Marques et al. (63)	2022	Brazil	Exploratory/ descriptive	Level 4	A theoretical framework to guide study

more than half (57%) used intervention/control groups (53,55,56,58,59), while less than half (43%) used 1 group with data collection prior and post-intervention (52,54,57). The duration for the interventional studies ranges between a minimum of twelve weeks (55), and the maximum 8 months (56), regarding the number of sessions, the minimum was one session (55), and the highest was four sessions (52). The period spent in session during interventional studies ranges from 25-30 minutes (53), to the highest of three hours (Table 1) (56).

Aspects of T2DM Self-care and Outcome Measures Reviewed Articles Using SCNT Focused; SCNT and Self-care Competency, Information Retention and T2DM Glycaemic Control

One of the interventional articles as shown in Table 2 focused on improving physical, cognitive, emotional, and motivational competence of patients with T2DM for self-care before (T1) and after (T2) being included in a multi-professional educational program showed the result of physical competence scores varied in T1 from an average of 17.80 [standard deviation (SD)=1.54 to an average of 18.10 (SD=1.43) in T2; regarding cognitive competence, the total sum of scores in T1 varied from an average of 21.35 (SD=4.28) to an average of 33.26 (SD=3.68) in T2. Regarding emotional and motivational competence, the total scores varied from an average of 34.51 (SD=4.50) to 37.98 (SD=3.80). The findings showed a significant increase after the intervention, the researchers conclude that nurses can apply the findings to similar contexts after considering the study's limitations (52). In Table 2, the Iranian study focused on the effect of the teach-back method to teach T2DM self-care. The average score of foot self-care for the pretest was lower in the teach-back group than in the control group. However, at post-tests 1, 2, and 3 (i.e., seven days, 1, and 3 months), the score in the intervention (teach-back) group was higher significantly than the control group. The one-way analysis of variance comparison within the group showed that the self-care average score significantly differed across the four time measurement points ($p<0.001$) in the teach-back group. After 1 and 3 months of the treatment (intervention), the average foot self-care score in the teach-back group was more significant than the pretest readings in the same (teach-back) and control groups. The results showed the intervention (teach-back education) effectiveness in enhancing information retention; hence, the researchers recommended the technique for larger-scale studies or improving patients' self-care abilities (53). Furthermore, a double-blind, randomized control study was carried out in Turkey as seen in Table 2, to determine the effect of diabetes education and intervention on self-care in T2DM patients. After implementing the SCNT-based self-management diabetes intervention, the researchers found a significant difference between the groups in the aspect of self-care agency ($p<0.05$). The pretest and post-test score analysis showed that post-intervention scores for the

Table 2.
SCNT and Self-care Competency, Information Retention, and T2DM Glycaemic Control

Author(s)/ reference number	Purpose of the study	Methodological approach	Sample	Findings
Landim et al. (52)	To compare self-care competencies of patients with T2DM before and after participating in an intervention programme.	Quasi-experimental	Forty-three patients (male/ female)	Significant differences existed in the cognitive, emotional, and motivational self-care competency after the intervention.
Mahmoudirad et al. (53)	To determine how teach-back instruction affects T2DM patients' foot self-care.	Quasi-experimental	Seventy patients (male/female)	The effect of the teach-back method on foot self-care showed effectiveness in enhancing information retention.
Surucu et al. (56)	To determine how diabetes education based on the SCNT affects T2DM patients' HbA1c levels, self-care agency, and self-care actions.	Quasi-experimental	One hundred thirty-nine patients (male/female)	Results showed that self-care activity and agency, as well as the glycemic control of patients in the intervention group, improved significantly.
Abd El-Aal and El-Nagar (57)	To assess the impact of a self-care education program based on SCNT on T2DM patients' self-care ability and fasting blood sugar levels.	Quasi-experimental	One hundred ten patients (male/ female)	Findings showed significant improvement in self-care management and reduced FBS among patients.

T2DM=type II diabetes mellitus, SCNT=self-care nursing theory, HbA1c=glycaeted haemoglobin

self-care agency and activity were higher and the value of glycaeted haemoglobin was lower than the pre-intervention average ($p<0.05$). The researchers conclude that self-management, self-care activity, and agency, as well as the glycaemic control of patients in the intervention group, improved; hence, SCNT was an excellent strategy in planning and implementing self-management education studies (56). Lastly implementing an educational intervention based on the SCNT as shown in Table 2 has significantly improved diabetes-related knowledge, self-care management, and reduced fasting blood glucose (FBG) among patients with T2DM. Since the patient's evaluation of diabetes affects their self-care management, the researchers concluded that designing and implementing an Orem's based self-care management program can improve the self-care management of patients with T2DM, thereby improving the disease outcomes (Table 2) (57).

SCNT and Improving T2DM QOL

Two of the reviewed articles in Table 3 examined the effect of self-care education on diabetes patients QOL; both of the studies were conducted in Iran, and one of the studies evaluated the effect of the self-care education on QOL in T2DM patients. The results showed differences in the three aspects of QOL but were not statistically significant. The impact of self-care education on patients' QOL affects the overall average of QOL, but this increase was not statistically significant (54). The other study in Table 3 that implemented the Orem self-care model improved the QOL of patients in the interventional group in all aspects except general health and emotional functioning. Based on the result, the researchers conclude that nurses in clinical care can use the model to provide the necessary training to patients, thereby increasing their QOL. Teachers can also emphasize this self-care model in nursing education to nurture students toward improving the QOL of patients with diabetes (55). Another study determined the effect of a one-to-one health education intervention based on self-care theory on the self-management ability and QOL in patients with recently diagnosed T2DM. A total of one hundred and six admitted patients in the First People's Hospital of Wenling were divided into a control and observation group (n=53 each) based on admission; the observation group received one-on-one health education according to Orem's theory of self-care, while the control group received routine health education. The researchers compared self-management ability (SCSCA rating), self-efficacy [general self-efficacy scale (GSES) rating], FBG, QOL, 2-hour postprandial glucose (2-h PG), nursing satisfaction, and treatment compliance before and after the intervention in each group. Researchers found no significant difference in summary of diabetes self-care activities (SDSCA) or GSES scores between observation and control groups before intervention as shown in Table 3. Still, the SDSCA and GSES scores in the groups after intervention were greater than before ($p<0.05$), and the difference is significant. In addition, the treatment compliance rate was lower in the control group than in the observation group ($p<0.05$). After the intervention, in the observation group, fasting plasma glucose and 2-h PG were less than those in the control group ($p<0.05$), and the difference was significant. For QOL and nursing satisfaction after the intervention, the scores were significantly higher in the observation groups, and the difference was significant for both parameters ($p<0.05$). The researchers concluded that a one-to-one education intervention built on the self-care theory could increase self-management skills and self-efficacy in patients with recently diagnosed T2DM, improve treatment adherence, and encourage reduction of blood sugar. Achieving the mentioned goals improves patients' QOL and increases nursing satisfaction (Table 3) (59).

Table 3.
SCNT and Improving T2DM QOL

Author(s)/ reference number	Purpose of the study	Methodological approach	Sample	Findings
Baraz et al. (54)	To evaluate how well self-care education programs promote T2DM patients' QOL.	Quasi-experimental	Thirty patients (male/female)	Findings showed that self-care education affects the overall average QOL, but this increase was insignificant.
Borji et al. (55)	To determine the impact of Orem's self-care program on T2DM patients' QOL.	Quasi-experimental	Eighty patients (male/female)	Findings indicated that implementing the Orem self-care model improved the QOL of patients in all aspects except general health and emotional functioning.
Xiaojuan (59)	To determine the Impact of self-care education intervention on QOL of T2DM patients.	Quasi-experimental	One hundred six patients (male/female)	Findings showed that QOL scores after the intervention were significantly higher in the observation groups, and the difference was significant.

SCNT=self-care nursing theory, T2DM=type II diabetes mellitus, QOL=quality of life

SCNT, Professional Nursing Practice and Management of T2DM Foot Ulcers

Among the reviewed articles in Table 4, one used a case study as a methodological approach; findings showed the patient's knowledge led to self-monitoring of blood glucose with food choices supporting adequate glycemic control and a total weight reduction of 7.6 pounds, surpassing her shorter-term target (51). One Iranian intervention study in Table 4 demonstrated that implementing Orem's self-care program has a positive effect on improving the self-care behaviours of patients. The researchers found a significant difference ($p<0.05$) between the groups on self-care average scores, infection, ischemia, affected areas (zones), and wound healing. The model application helps manage foot ulcers, and changes patients' lives through decreasing medical cost and the risk of amputation. The researchers suggest conducting large-scale studies in other regions with different educational and cultural systems so that the impact of the model's application can be studied broadly and used effectively for diabetic foot ulcer. The study results can benefit nursing management, diabetes associations, diabetic patients and their families. Using a qualitative approach (interviews and focused group discussions) as seen in Table 4, twelve elderly patients with T2DM were evaluated to indicate nursing diagnoses and conditioning factors of self-care in the light of Orem's theory of self-care. After validating the nursing diagnoses, collected data were analyzed using thematic analysis with the help of MAXQD software, version 20.0.8. The results of the identified twenty nursing diagnoses were supported by SCNT, with the nurse's role as a guide and support for the practice of self-care, especially for aged people with T2DM. The major categories of the identified diagnosis were related to a lack of therapeutic adherence (self-neglect; ineffective health maintenance). Sedentary lifestyle (joint stiffness, pain, lack of family support): risk of unstable sugar, and impaired urinary elimination, among others. The theoretical support to systematize nursing care allows comprehensive and individualized care for the elderly with T2DM. This strategic application of SCNT is a guide for implementing nursing interventions to promote self-care for T2DM (Table 4) (63).

SCNT as the Framework for Studying and Predicting T2DM Self-care Behaviours

One of the studies in Table 5 determined the relationship between exercise/physical activity and obesity in adults with T2DM using a descriptive correlational design. One hundred twenty-four patients were selected using a random sample from seventeen community centers. Findings showed the average number of steps in a day indicated a reversed relationship between the body mass index (-0.282, $p<0.01$) and waist circumference (-0.300, $p<0.01$). Exercise and knowledge of diabetes were positively correlated ($r=0.179$, $p=0.04$). Women ($p<0.05$) had a higher body fat percentage than men. The researchers concluded that findings significantly impact professional nursing practice and are essential in fostering self-care behaviours such as physical activity (60). In Table 5, a study described the respondents' knowledge and self-care management practices; findings indicated moderate-to-high knowledge of glucose monitoring, foot care, and drug compliance (61). Another study in Table 5 focused on health-promoting and self-care behaviours that needs visits to a health care practitioner or provider using the key variables. Regression analysis showed that the R2 for the socio-economic and socio-cultural variables accounted for 4.2% of the variance. Age at diagnosis and income level showed a significant negative relationship. The scores of the older women were

Table 4.
SCNT, Professional Nursing Practice and Management of T2DM Foot Ulcers

Author(s)/ reference number	Purpose of the study	Methodological approach	Sample	Findings
Kumar (51)	The purpose is to illustrate nursing practice for T2DM using SCNT by a clinical nurse specialist.	Case study	One elderly woman	SCNT-based nursing care improved the client's ability to self-manage T2DM.
Hemmati Maslakpak et al. (58)	To determine the application of SCNT in the prevention and management of diabetic foot ulcer.	Quasi-experimental	Sixty patients (male/female)	Self-care means scores showed a significant improvement in the intervention group compared to the control group.
Marques et al. (63)	To identify nursing diagnoses and factors of self-care among older adults with T2DM based on SCNT.	Exploratory/ descriptive	Twelve patients (male/female)	The identified diagnoses were related to a lack of therapeutic adherence, risk of unstable sugar, and impaired urinary elimination; the researchers concluded that the strategic application of SCNT guides nursing interventions that promote self-care for T2DM.

SCNT=self-care nursing theory, T2DM=type II diabetes mellitus

Table 5.
SCNT as the Framework for Studying and Predicting T2DM Self-care Behaviours

Author(s)/ reference number	Purpose of the study	Methodological approach	Sample	Findings
Compean-Ortiz et al. (60)	To determine the relationship between physical activity, exercise and diabetes education and comprehension.	Correlational/ descriptive	One hundred twenty-four patients (male/ female)	The findings significantly impact professional nursing practice and foster self-care behaviours.
Unuoha et al. (61)	To ascertain the patients' self-care management knowledge and practice for T2DM.	Correlational/ descriptive	Sixty-six patients (male/ female)	Findings indicated moderate-to-high knowledge of glucose monitoring, foot care, and drug compliance.
Leininger and McFarland (62)	To ascertain which BCF among T2DM influenced health-promoting self-care behaviours.	Correlational/predictive	Four thousand six hundred eighty-three women	Findings showed the scores of the older women were lower and subjects with lower income levels practiced little self-care.

SCNT=self-care nursing theory, T2DM=type II diabetes mellitus, BCF=basic conditioning factors

lower and they reported fewer health-promoting self-care behaviours, necessitating more healthcare provider visits than younger women. Subjects with lower income levels practiced little self-care, hence employment status was positively associated with the behaviours; employed subjects had higher ratings and were likelier to practice self-care behaviours that needed a healthcare practitioner visit. The study exemplifies the applicability of SCNT to African American women with T2DM using previous records (Table 5) (62).

Discussion

The review showed the resourcefulness of applying Orem's theory to the self-care of T2DM. All the authors were nurses, and publications occurred in nursing journals from eight countries. Iran was the foremost country among the reviewed articles, scientific publication and production have grown steadily. As of 2022, the country occupies the 15th position worldwide in the Scopus database ranking, with more than 78,000 scientific articles (64), and ranked 15th and 16th in scientific publications worldwide (65). One of the studies (52), used educational programs that align with the ADA recommendations for improving competencies in diabetes self-management (66), the implementation of a teach-back method by an Iranian study enhanced self-care information retention while self-care agency, activity and glycemic control were improved among the respondents that participated in a Turkish study (56). Based on the above results, one can infer that SCNT was an excellent strategy for planning and implementing self-management education studies. One of the studies (54), reported overall average QOL of the participants in the treatment group increased, but this increase was not statistically significant; thus, the researchers thought psychological issues caused the patient's problems and conflicts (67), and possibly because the designed educational program did not cover psychological issues, the results are close to expectations; the researchers suggest that future research should focus on the psychological distress resulting from T2DM and its impact on patient's QOL.

The China study found that QOL scores were higher and significant after the intervention; based on the result, nurses in clinical care can use the model to provide the necessary training to patients, thereby increasing their QOL (59). Teachers can also emphasize this self-care model in nursing education to nurture students toward improving the QOL of T2DM patients. Concerning the above findings, other researchers also reported significant findings as a result of the application of Orem's theory in managing chronic conditions; these include decreasing fatigue in multiple sclerosis patients (68), motor balance and function in multiple sclerosis patients (69), QOL and self-efficacy in patients with hypertension (70), and the self-care ability of patients with myocardial infarction (71), all the studies were interventional and reported significant findings.

The review showed SCNT was utilized as a theoretical framework that guides study, helps predict health-promoting and self-care behaviours among respondents and provides individualized nursing interventions that enhance self-care for T2DM (51,60,62,63), these results make it necessary for clinical nurse specialists to provide treatment in a variety of settings and contexts according to their knowledge and abilities in counselling and teaching (51). An increase in the number of T2DM clients will increase the need for experts in the field; in response to this demand,

nurses are collaborating with clients to collect data and discuss choices and needs. Related to the above findings are pieces of literature supporting the use of SCNT for a case study on other chronic conditions like stroke and psychiatric conditions (72,73).

Study Limitations

In terms of limitation, the researchers used only articles published on electronic data bases based on the inclusion criteria, this may limit access to other useful literatures regarding the topic. In addition, diverse methodologies, literature sources for different data bases and articles written in English may influence this integrative review results, this necessitates careful interpretation of the above findings. However, despite these limitations, researchers used well-defined criteria and quality assessments to ensure that the articles reviewed provide evidence-based findings and mitigate these limitations.

Directions for Future Research

Based on the review, only 1 article utilized the theory as a case study approach for T2DM (71); this showed a need for more literature on case studies on T2DM self-care using SCNT, hence the need to address the identified gap. Among the reviewed articles, only one utilized a qualitative approach (83): this also signifies a need for more published literature on the qualitative methodological approach, constituting a significant gap that should be filled. Among the reviewed articles, there is no study that use mixed-method research design; despite seeming significant, this also forms a research gap that should be considered. The experimental and non-experimental articles reviewed focused on SCNT and related outcomes, such as self-care behaviours and management abilities (52,55,56); QOL (53,54,58), and improving physical, emotional, cognitive, and motivational competence (51); none focused on SCNT and constructs related to mental health, such as psychological distress, which is common among T2DM patients; this also forms a critical gap in the literature. All the interventional studies that used SCNT as a teaching strategy utilized traditional or routine teaching methods despite the advantages of technology, such as social media, mobile applications and online teaching, which also need special consideration for future research related to SCNT and T2DM. Most of the studies were conducted in middle- and high-income countries; there is no single article among the reviewed papers from developing countries, especially in Sub-Saharan Africa. Hence, research is needed to describe how SCNT is applied in various regional settings and cultures.

Conclusion

The review provides several meaningful insights and directions for future research in applying SCNT to the self-care of T2DM; the theory application for self-care of T2DM patients has shown promise and effectiveness. However, there are various avenues for further research and exploration, including addressing psychological aspects, adopting diverse research methodologies, and expanding the use of the theory in different cultural and regional contexts. This review highlights the evolving nature of nursing theory (SCNT) and the potential for continued growth and innovation in managing chronic conditions like T2DM.

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