

Lived Experiences of Diabetes Team and Patients about Diabetes Care System after Redesigning Delivery System and Supporting Self-Management in Iran: A Qualitative Research

Abstract

Background: Diabetes as a chronic disease requires a change in the paradigm of treatment and health care system based on acute illnesses to chronic conditions. Chronic Care Model has been designed to address this need. This study aimed to explore the lived experiences of the diabetes team and diabetic patients regarding the health care system after redesigning delivery system and supporting self-management based on the Chronic Care Model in Iran. **Methods:** Research was conducted with a qualitative descriptive approach in one of the Isfahan city clinics in 2018. The participants were diabetes team (composed of diabetes physician, nurse, assistant nurse and dean of the clinic) and 17 type- 2 diabetic patients who were selected through purposive sampling. Data collection was performed through semi-structured interviews and then were analyzed using content analysis with an inductive approach. **Results:** The findings of this study were composed of the following two main categories: (1) educational function change, including the sub-categories of evidence-based nurse education and patients' demand to ongoing participation in the training classes; and (2) treatment and care method upgrade, including the sub-categories of nurse's role change in a team approach, continuity in cares and upgrading patients' self-care behaviors. **Conclusions:** Delivery system redesign and diabetes self-management support based on Chronic Care Model changed organizational structure and performance of the diabetes care system. It also reformed the structure of treatment providers from a vertical and hierarchical form to a team arrangement. Nurse's educational function became evidence-based and patients' self-care behaviors upgraded.

Keywords: Diabetes mellitus, education, qualitative research, self care, type 2

Introduction

Diabetes management is one of the main challenges of care delivery systems and unfortunately, in many countries with low and middle income, have not been organized properly to provide care for chronic diseases such as diabetes.^[1] Meeting the care needs of patients with a chronic disease requires a team-based and patient-centered approach. The purpose of team work approach is to engage patients more effectively in planned activities to assist themselves and the support systems in disease management.^[2] In fact, successful management of diabetes requires effective teamwork between the patients and the caregivers.^[3] Particularly in countries like Iran where managing a team work is a challenge.^[4] The cares must change from inactive, disease-centered form into patient-centered approach. Therefore, the

system of providing care to patients with chronic diseases requires fundamental redesign.^[5,6]

Wagner and co-workers provided the Chronic Care Model in response to above mentioned challenges.^[7] This model is composed of the following six components: (i) delivery system redesign; (ii) self-management support; (iii) clinical information systems; (iv) decision support; (v) organization of health care and; (vi) community resources and policies.^[8] In the standard protocol of diabetes care of the American Diabetes Association and World Health Organization, Chronic Care Model has also been introduced as an effective model to upgrade disease management in patients with chronic care needs including diabetes.^[5,9]

According to the research conducted in Iran, the structure of the primary care

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delivery system requires changes proportional to the social and economical changes in the country in line with the nature of the chronic disease. The primary care system has flaws like lack of flexibility in its structure proportional to the changes in health demands, weak human resource planning, weak integrated and comprehensive patient care and insufficient training of care givers.^[10,11] To confront this challenge, the researchers in Iran implemented the Chronic Care Model employing an action research approach in one of the clinics affiliated with the Iranian insurance system for the first time. In the first step, they used qualitative content analysis for status analysis. After implementing the two components of the Chronic Care Model (system redesign and diabetes self-management support), in the observation step, the researchers conducted a second qualitative study aiming at exploring the lived experiences of diabetes care team and diabetic patients of diabetes care system. Results of this study are presented in this article.

Methods

This study is part of a PhD dissertation on the topic of “Improving the quality of diabetes care based on the Chronic Care Model (CCM): An action research” which was conducted after implementing two components of the Chronic Care Model, i.e., delivery system redesign and self-management support in 2018. For delivery system redesign (i.e. component one) the following items were implemented: Determining the roles and duties of each member of the team, assignment of some tasks to non-physician staff (mainly nurse), and designing patients’ follow-up system. For self-management support (i.e. component two) the following items were performed: Upgrading nurse’s knowledge regarding diabetes by employing trained nurse educator and organizing educational classes for the patients using trained nurse.

It is necessary to mention that action research approach was conducted by planning, action, observation, reflection, and revision plan stages from 2015 to 2017. First, components of the Chronic Care Model were introduced in a meeting, the personnel tasks were determined with team attitude and the components of the Chronic Care Model were planned to be implemented. In the action stage, the components of the Chronic Care Model were implemented and in addition to model implementation and observation of results, reflections (brainstorming meetings) were carried out constantly between the research team and the treatment team to provide effective solutions and agreements. Consequently, some changes were made in the planning and model implementation based on the reflections. To evaluate the model performance, qualitative and quantitative methods were used. Then, in a meeting between the two teams, the obtained results were presented and discussed, and the revision plan was done for the next cycle.

Setting and participants

The research setting was a specialized polyclinic affiliated to Isfahan insurance system. This clinic had diabetes unit with more than 2000 diabetic patients. The participants of the study were the diabetes team of the clinic (composed of the following 4 persons: Including diabetes physician, nurse, assistant nurse and dean of the clinic) and 17 type- 2 diabetic patients who were under the coverage of the clinic and were selected through purposive sampling method. Inclusion criteria were participation in the implementation of the two components of the Chronic Care Model as explained above.

Data collection

Semi-structured interviews with the diabetes team and the diabetic patients of the clinic were conducted. In the interviews with the treatment team as well as the patients, some open questions were asked. Some of these questions were listed in [Table 1]. The interviews were conducted in 30 to 45 minutes in a clinic room with appropriate physical conditions in terms of sound, light, air conditioning and privacy. Ethical committee of Isfahan University of Medical Sciences approved the study (IR.MUI.REC.1395.3.374). Ethical points of the survey, such as explaining the aim of the research, participants’ satisfaction, asking for their permission to record the interviews and keeping the information confidential, were considered and implemented. It was also explained that they can give up in any stage of the interview and research.

Data analysis

Qualitative content analysis was conducted according to the suggested steps by Graneheim and Lundman (2004)^[12] i.e., each interview was recorded by a voice recorder (Mobile voice recorder) and written verbatim, and then the next interview was conducted. In fact, data analysis continued up to saturation point i.e., when no more new concept was yielded by data analysis. Out of the 21 transcribed interviews, 105 codes were extracted after eliminating the repetitive and integrating the similar codes. In the next step similar codes were grouped under sub-categories and the main categories were made using inductive process. Content analysis data before running the model has also been used as data source in this content analysis.^[4]

Data rigor

According to Guba, rigor of the data was checked through having four criteria of credibility, dependability, confirmability and transferability.^[13] For data credibility, prolonged deep conflict with the data, peer inquire, the review of the data, codes, subcategories and categories and member check were performed. The dependability of the data was performed through the systematic clarification of the data collection and analysis with the

Table 1: Some of the questions asked during data collection

Participants	Questions
Treatment team	<p>What were your experiences from the team-based work?</p> <p>What were your experiences from attending the training classes?</p> <p>What changes were made to the diabetes care program?</p> <p>How did patients react to the implementation of the care programs?</p> <p>What changes were made in the duties of the diabetes nurse?</p> <p>Did the level of knowledge of the team nurse change?</p>
Patients	<p>What were your experiences from attending the training classes?</p> <p>What changes were made in your diabetes care after initiation of the training classes?</p> <p>What changes have taken place in your self-care behaviors (e.g. diet, physical exercise, visiting the physician and medical treatments)?</p> <p>How did you react to the training classes?</p>

research team's review of the findings. For confirmability of some interviews, the codes and classifications were extracted and given to a panel of faculty members who were familiar with qualitative research analysis and who did not participate in the study and they were asked to examine the authenticity of the coding process. Data transferability was ensured by offering a rich description of the findings for future evaluation and applicability in other fields.

Results

The participants of this study were 17 type -2 diabetic patients and 4 members of the diabetes team. The patients' age range was from 38 to 65 years old, there were 8 women and 9 men and in terms of education, 3 of them were illiterate and 9 had preliminary education, 2 were attending the literacy classes and 3 had high-school diplomas. The age range of the treatment team (i.e., diabetes physician, nurse, assistant nurse, and dean of the clinic) was from 33 to 47 years old and they had 4.5 years of work experience.

Qualitative data of content analysis were obtained in two main categories and five sub-categories as listed in [Table 2].

Educational function change

This main category includes two sub-categories: (i) evidence-based nurse education; and (ii) patients' demand to ongoing participation in the educational classes.

Evidence-based nurse education

Diabetes team experiences showed that not using evidence-based instructions before running the Chronic Care Model changed nurse education into the most updated and accredited resources which made the educational curriculum and resulted in changes in awareness and nurse's educational function level.

According to the statement of the nurse: *"The fact that my information about diabetes increased and is completely different now, means that the one-month course I passed with a coach was excellent and I got much information compared to the past ..."* (p1).

Upgrading nurse knowledge level about educational principles and content of diabetes self-management changed the nurse attitude and belief regarding educational role and educational function.

Nurse stated that: *"I taught my patients in group educational classes based on our plan, sometimes even I taught them in night shifts based on my new information. I told them to come for class on a special day because I was worried about them ..."* (p1)

Dean of the clinic stated that: *"The patients' visit was done based on the newest ADA (American Diabetes Association). The educations were especially about lifestyle, nutrition, sport and physical activity and also, what medicines they must use and which ones not to take..."* (p4)

Patients' demand to ongoing participation in the educational classes

Participants' experiences indicated that as nurse's educational function changed, patients' motivation to educational classes increased. While before running the Model "Not committed to participate in the group training courses" was one of the related sub-categories in the main category of defective diabetes self-management.

The assistant nurse stated that: *"Patients followed up the classes up themselves and attended them willingly. In the last sessions, we had no more places for sitting and we were forced to add some chairs ..."* (p3)

A patient said: *"Whenever they called me, I came for classes and I enjoyed attending the classes because I had a very good feeling ..."* (p5)

One patient said: *"They called me to attend the classes and I was always on time. Even if I had something to do, I put that aside and prioritized attending the classes because that was very important to me ..."* (p17)

Another patient said: *"Whenever there was a class, I attended and I saw that they talked about interesting subjects and I was eager to come and I saw the outcome of my learning in the tests ..."* (p8)

Table 2: Main categories and sub-categories extracted from the qualitative data

Main category	Sub-category
Educational function change	Evidence-based nurse education Patients' demand to ongoing participation in the educational classes
Treatment and care method upgrade	Nurse's role change in a team approach Continuity in the cares Upgrading patients' self-care behaviors

Treatment and care method upgrade

This main category is made up of the following three sub-categories: (i) nurse's role change in a team approach; (ii) continuity in cares; and (iii) upgrading patients' self-care behaviors.

Nurse's role change in a team approach

Qualitative data analysis revealed team approach development in care giving as of redefining each member's role and highlighting the interaction among the team members.

Team nurse stated that: "...*Unlike in the past, when my only task was to teach patients how to inject insulin, according to the new plan, I am also supposed to check and interpret the patients' test results. All patients first came to me and then to the physician and he visited the patient after reading my report...*" (p1).

The diabetes team physician said: "*I read the nurse's report first and I even highlighted the patient's critical points. The point was that she gave me some clues about the patient's problem and I told her if there was a point...*" (p2).

One of the patients said: "*When I came to the clinic, I first went to the nurse. She checked my blood glucose in the booklet and explained to me medical condition, and then I went to see the physician ...*" (p16).

Dean of the clinic said: "*The nurse collaboration with the physician was very important. The management of the clinic in coordinating the work of the nurse and the physician was excellent. In fact they performed in a team approach ...*"(p4).

Continuity in the cares

Despite the fact that one of the emerging sub-categories in the main category of weakness in care delivery system in the qualitative study before running the model was "Lack of patients' follow-up system", but care continuation through making patients' follow-up system to participate in classes, assessment and planning for patients' care upgrade was among the consequences of running the model which emerged well in the diabetes team members' experiences.

Team nurse stated: "*The assistant nurse called patients the day before of the class and those patients who have*

never visited the clinic despite having a record there, collaborated in this plan. In the first sessions, the classes were not crowded, but gradually, the number reached 16, because of the assistant nurse's follow-up ..." (p1).

Team assistant nurse stated: "*Among what I had to do, calling the patients was my main responsibility. The nurse listed the patients' names and I brought out their file numbers and telephone numbers from the list and I informed them about the day they should come for their classes ...*" (p3).

One patient said: "*They held classes for us and called us to come for tests ...*" (p11).

Upgrading patients' self-care behaviors

While in the qualitative analysis before running the Chronic Care Model, sub-categories of "Not committed to visit the physician regularly", "Not committed to the diet", "Not committed to do physical exercise" and "Not committed to medical treatment" were among the emerged concepts in the main category of "Defective diabetes self-care" that were signs of no commitment from the patients' side. Participants' experiences after running the model showed that patients' commitment increased to their therapeutic regimen.

One of the patients said: "*I used the device to measure my blood glucose 2 hours, after breakfast, after lunch and after dinner and noted them in my booklet ...*" (p6)

Another patient said: "*We concluded that our blood glucose should be controlled and I measured it before I came here, it was 115; however, before this 6 month period my blood glucose level was about 180 or 190 ...*" (p13)

Another patient said, "*I lost 10 kilos during this 5-6 months and I performed the diet they gave me...*" (p5)

Discussion

Redesigning delivery system and supporting diabetes self-management are two components of the Chronic Care Model that have been developed to promote care in chronic diseases including diabetes. The conducted qualitative content analysis in this study revealed important points. This model's capability in moving diabetes treatment system towards a team approach in a country with middle income is a significant finding, because most studies have shown positive results of the Chronic Care Model in the developed or high-income countries,^[14-17] and the interesting point is that this study was conducted in a diabetic clinic located in a populated and low income part of town and there was only one diabetes physician and one nurse and an assistant nurse in the diabetes unit. However, the study data analysis showed a change in the educational function, in a way that nurse education was moved towards evidence-based education and resulted in patients' willingness to collaborate and their voluntary presence in

the classes. The findings of a systematic review showed that there were positive results in the health consequences of the patients whose care team was trained based on the evidence.^[18] In order to move diabetes education towards evidence-based, it is necessary to increase educator's knowledge and skill in the field of diabetes self-management principles, and this was a significant key matter that formed this infrastructure based on diabetes self-management support in the Chronic Care Model in this study. While qualitative study results showed that the nurses were employed without assessing their diabetes-related knowledge or the necessity of training experience of diabetic patients or even without passing educational courses in diabetes centers.^[11] The results of another study showed that the most important facilitators of training the patients include, developing the educator's knowledge and skill, increasing the interest of the educator and the learner in the educational programs and implementing of the planned education.^[19] The results of another study also showed that providing systematic education to patients by a trained person can lead to improve self-care behaviors.^[20]

Patients' demand to ongoing participation in classes was among the concepts that emerged in this study. This is while before running the component of diabetes self-management support, the results of diabetes management status analysis in the clinic showed no tendency and insufficient willingness of patients towards participating in the educational classes.^[4] Moreover, another study confirmed patients' reluctance to attend diabetes educational classes.^[21] While systematic review findings on the benefits and limitations of the Chronic Care Model in the primary care programs have shown that the use of this model increases patients' satisfaction with the care service.^[22]

Treatment and care method upgrade was the other emerged concept after running the model. Expansion the role of the nurse became the basis for the formation of teamwork and followed the provision of continuous care for patients. The study have shown that organizing care-giving systems (constructing a specialist team and a follow-up system) can upgrade the health results of patients with type-2 diabetes.^[16] In the team work approach, primary care providers must collaborate and try to provide integrated care and they must be supported by interdisciplinary diabetes professionals. The results of several studies based on the Chronic Care Model have shown that in addition to nurses and nutritionists, the team also used mental health care providers.^[23]

Upgrading patients' self-care behaviors was the result of forming a teamwork approach in the context of nurse role change and educational function change in training the patients. Different studies have shown that for achieving an efficient self-care in diabetes management, it is necessary that the care providers accept the Chronic Care Model and activate the patients in the self-care approach based on this

model.^[24] Extensive research on the benefits of patient-centered care has shown that it can lead to results that are beneficial to both patients and the health care providers. Therefore, when support, education and information are provided for the patients, they can decide how to apply the information appropriately to manage their life style.^[25,26] The results of another systematic review also showed that the studies which use the Chronic Care Model concluded that healthy life style behaviors including commitment to diet, regular physical activity and stress management among diabetic patients could improve the patients' health consequences, and lead to significant clinical results and reduce the treatment costs as well as mortality rate in the health-care system.^[27]

Conclusions

Redesigning the delivery system and supporting diabetes self-management based on the Chronic Care Model in diabetes care and treatment, changed the organizational structure and performance of the diabetic care and treatment providers. Care delivery system changed from vertical and hierarchical structure to a team structure, on the other hand, highlighting the importance and efficiency of expanding the nurse's tasks in the diabetes management, showed that despite lack of human resources, improving knowledge level, attitude of treatment team towards evidence-based and continuous performance, can have an important role in developing and improving patients' self-management behaviors. Therefore, it seems that diabetes policymakers can implement system redesign and self-management support to improve the current challenges of diabetes management.

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Conflicts of interest

There are no conflicts of interest.

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