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RESEARCH ARTICLE

ASSESSMENT OF DIABETES DISEASE MANAGEMENT IN SAUDI PRIMARY HEALTH CARE: A CROSS-SECTIONAL STUDY

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ABSTRACT

Objectives: The aim of the study is to assess diabetes disease management in AlMadinah's primary health care sector. **Methods:** A cross sectional study conducted at all primary health care centers in AlMadinah City from 2nd February until 27th February 2016. This study utilizes the chronic care model (CCM) framework to examine the extent to which diabetes healthcare services are implemented. Seventy-five physicians representing chronic care clinics participated in this study by responding the Assessment of Chronic Illness Care questionnaire. Descriptive statistics were derived as instructed by the instrument's guidelines. **Results:** The overall Assessment of Chronic Illness Care mean is 6.12 (SD=2.4) and the highest subscale mean is 7.2 (SD=2.2) for the organization of the health care system while the lowest mean is 5.5 (SD=2.4) for the self-management subscale. Lowest items scores were community programs and partnership with community organizations, 4.3 (SD=3) and 4.8 (SD=2.2) respectively. **Conclusion:** The study results revealed reasonable implementations of the chronic care model with questionable community participation effectiveness in managing diabetes. However, further studies are needed to provide more in-depth assessment of each component of the CCM including patients' perceptions and nurses' roles in managing chronic illnesses.

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INTRODUCTION

The impacts of chronic illnesses are increasing steadily, affecting patients, families, and health care organizations around the world(Mills *et al*., 2015). The situation in Saudi Arabia is similar to other countries. Chronic diseases are responsible for 75,000 to 76,000 hospital emergency visits for diabetes and hypertension annually, respectively(Saudi Ministry of Health, 2015). The prevalence of diabetes in Saudi Arabia is projected to increase from 20.2% in 2013 to 27.1% in 2035, which is considered a major national threat affecting a large segment of the Saudi population (Guariguata *et al*., 2014).Furthermore, consequences such as the current projected cost of 27 billion riyals may work against government efforts to regulate and enhance the public health care sector's performance (Mokdad *et al*., 2015). The management of such challenges may need to focus efforts on increasing the primary health care (PHC) sector's capacity to adapt the best evidence-based practices in disease management. According to the Ministry of Health's (MOH) 2015 report, there were about 2.5 million visits to chronic illness clinics among 2,282 PHC centers (PHCCs) in Saudi Arabia (Saudi Ministry of Health, 2015).

However, there is a need to assess current chronic illness care and whether it is congruent with international chronic disease management innovations (Al-Daghri *et al*., 2011; AlMomen, Abdelhay, Alrowais, and Elsaid, 2015). Specifically, this study utilized the chronic care model (CCM), which has been widely implemented in numerous countries to improve chronic illness care and the quality of services, as a framework to examine the extent to which chronic illness services such as diabetes are implemented in PHC (Coleman, Austin, Brach, and Wagner, 2009; Steurer-Stey *et al*., 2010). The chronic care model was designed by Wagner in 1996 to enhance health care system outcomes and disease management practices for individual patients or population-based management (Fiandt, 2006). The CCM was the outcome of extensive literature reviews to combine the three main components of the community, provider organizations, and health care systems (Bodenheimer, Wagner, and Grumbach, 2002). The model consists of six domains: community resources and policies, health care organizations, self-management support, delivery system design, decision support, and clinical information systems. The aim of the current study is to assess chronic disease management in AlMadinah's PHC sector using the CCM as a theoretical framework.

MATERIALS AND METHODS

Study design: This is a cross-sectional study utilizing the Assessment of Chronic Illness Care (ACIC) questionnaire, which is designed and widely used to assess interventions based on the CCM (Bonomi, Wagner, Glasgow, and VonKorff, 2002).

Setting and sample: This cross-sectional study was undertaken in AlMadinah City and involved primary health care physicians at 43 centers serving those with chronic illnesses. The mean monthly patient visits are 13,813(Saudi Ministry of Health, 2015). All of these centers operate chronic illness clinics including male and female clinics. From a planning standpoint, the PHCCs in AlMadinah City are grouped into four sections based on their geographical location. The study participants were physicians who worked at chronic illness clinics at the involved study sites. Physicians with more than a year of clinical experience were included in the study. Those who did not have recent clinical experience with chronic illness were excluded.

Ethical consideration: Permission to conduct the study was granted by the public health sector ethical committee of AlMadinah province (36/9/KA).

Measurement and instruments: The study instrument is the Assessment of Chronic Illness Care (ACIC), which was designed to assess interventions based on the CCM (Bonomi *et al*., 2002). This study utilized version 3.5, which includes 28 items assessing the six domains (subscales) of the CCM: the organization of the health care system (6 items), community linkages (3items), self-management support (4 items), decision support (4 items), delivery system design (6 items), and clinical information systems (5 items). The instrument scoring system is ranked into four levels of CCM implementation, D, C, B, and A, ranging from D, "little or none," to A, "fully implemented." Each level has three ratings of the degree to which the CCM implementation applies to the PHCC. The scoring is based on a 0-11 scale: 0-2 (little or no support for chronic illness care), 3-5 (basic or intermediate support for chronic illness care), 6-8 (advanced support), and 9-11 (optimal or comprehensive integrated care for chronic illness). The result for each subscale were derived by adding the responses.(Improving Chronic Illness Care, 2010)

Data collection and procedures: Data were collected by mailing the instrument to all of the PHCCs in AlMadinah Cityfrom2ndFebruary until 27th February 2016. It included a letter of explanation inviting potential participants to take part in the study. Since there was no personal information to be collected, no consent form was attached. Responding and returning the questionnaire was considered as agreeing to be part of the study. The respondents returned the scored instrument by mail to the researcher.

Data analysis: SPSS (version 20) was utilized to draw descriptive statistics following the instrument's guidelines.[11]

RESULTS

The study instrument mailed to 117 chronic care clinics' physician represented the entire target population. Initial response rate was 70.9% (83 participants). However, due to incomplete data, eight returned questionnaires were discarded. A total of 75 questionnaires were analyzed using descriptive data analysis with a response rate of 64.1%. The mean age of the participants was 42±5.52 years with mean primary health care experience of 11.2±5.05 years. Males represented 46.6% and Saudi nationals comprised 44.0% (Table 1). The majority worked in the northern section. Participants from the east, west, and south sections represented 32.0%, 22.6%, and 10.6% of the study sample, respectively.

Table 1. Participant characteristics

	Number	%
Gender		
Male	35	47
Female	40	53
Nationality		
Saudi	33	44
Expatriate	42	56
Sector		
North	26	35
South	8	11
East	24	32
West	17	22

The overall ACIC mean was 6.11±2.41 (Table 2). The highest subscale mean was 7.19±2.20 for the organization of health care systems while the lowest mean was 5.53±2.40 for the self-management subscale. The greatest two items were "benefits" within the organization of the health care system at 7.91±1.83 and "patient treatment plans" within the clinical information systems scale at 7.37±2.42 (Table 3). The lowest two items mean were "community programs" within the integration subscale at 4.29±2.99 and "partnership with community organizations" within the community linkages subscale at 4.80±2.21 (Table 4).

Table 2. ACIC scores

Components	Mean	SD
Organization of Health Care System	7.2	2.2
Community Linkages	5.7	2.3
Self-Management	5.5	2.4
Decision Support	5.9	2.4
Delivery System Design	6.3	2.6
Clinical Information System	6.3	2.6
Integration	6	2.5
Overall	6.12	2.4

DISCUSSION

Generally, the overall ACIC score in this study 6.11±2.41 was within the range of previous international studies in the USA, Korea, and the Netherlands (Choi, Shin, Kang, Bae, and Kim, 2014; Noël *et al*., 2014; Steurer-Stey *et al*., 2010). The closest score was obtained in the USA where the overall ACIC score was 6.20 ±2.10, while the assessment of chronic illness care in South Korea and the Switzerland had lower scores than this study (4.40 ±1.10 and 5.17 ± 1.55, respectively)(Noël *et al*., 2014; Steurer-Stey *et al*., 2010). Taking into account differences among health care systems in the aforementioned countries, people with chronic diseases have free access to the Saudi health care system, which may have positively affected the ACIC score. For example, assessing the benefits within the organization of the health care system in this study was 7.91±1.83, indicating physicians understand the benefits that the system brings to people with chronic illnesses.

Table 1. The highest mean for each subscale

Components	Mean	SD
Organization of Health Care System		
Benefits	7.9	1.8
Community Linkages		
Regional health plans	7.2	2.3
Self-Management		
Assessment and documentation of self-management needs and activities	5.8	2.3
Decision Support		
Evidence-based guidelines	6.5	2.3
Delivery System Design		
Continuity of care	7.2	2.3
Clinical Information Systems		
Patient treatment plans	7.3	2.4
Integration		
Routine follow-up for appointments, patient assessments, and goal planning	7.2	2.2

Table 2. The lowest mean for each subscale

Components	Mean	SD
Organization of Health Care System		
Incentives and regulations for chronic illness care	6.77	2.3
Community Linkages		
Partnership with community organizations	4.8	2.2
Self-Management		
Addressing concerns of patients and families	5.1	2.4
Decision Support		
Involvement of specialists in improving primary care	5.4	2.7
Delivery System Design		
Practice team functioning	5.5	2.6
Clinical Information Systems		
Information about relevant subgroups of patients who need services	5.6	2.9
Integration		
Community programs	4.3	3

Interestingly, the lowest score in this subscale was the incentives and regulations for chronic illness care 6.77±2.33. Although it is considered above the mid-score point, it may reveal physicians' concerns about the system limitations to responding to health care providers' needs in terms of new regulations and motivation to manage chronic illness at the primary health care level. Similarly, assessing the community linkages indicates that regional health plans are identified and disseminated properly 7.24±2.35, while partnership with community organizations 4.80±2.21 is not implemented properly.

From a disease management perspective, the score shows the positions of the two ends of diabetes care partners, the provider (the health care system) and the recipient (the community). Variation between the two scores indicates a limitation in community support. Moreover, it may identify health plans' inability to foster community participation. The Saudi government invested heavily in community organizations over the last decade; however, it appears that there is still a need for community infrastructure (Alqurashi, Aljabri, and Bokhari, 2011). Generally, patient-physician interactions in the Saudi health care system are minimal in contrast to Western countries, which by default contributes to low patient involvement (AlMomen *et al*., 2015). Furthermore, patient satisfaction with PHC is weighted based on the facility cleanness and staff competencies (Mohamed *et al*., 2015). Based on the picture of the patient position in the previous two studies, it is not easy to implement evidence-based self-management practices even though they are the cornerstone of chronic illness management (Sendall, McCosker, Crossley, and Bonner, 2017).

The lowest item within the self-management subscale5.53±2.40 was about addressing the concerns of patients and their families 5.11±2.38. Therefore, rapid improvement in chronic illness self-management is unlikely without addressing patients and their families as stakeholders who are supposed to lead the initiatives. It is recommended to focus future efforts on establishing mutual relationships between health care providers and their patients at the PHC level. Despite current practices in the assessment and documentation of self-management needs and activities 5.76±2.30, there is no evidence that current documented self-management practices are congruent with best practices. Consequently, health care providers' decision supports 5.93±2.45 is questionable and may need further exploration in future studies. These specifically include practice guidelines, provider education, activating patients, and specialty consultation (Improving Chronic Illness Care, 2010). In this study, specialists' involvement in improving primary care 5.39±2.76 reinforced the findings of previous studies that in general did not identify ideal referral systems in Saudi PHC (Senitan, Alhaiti, Gillespie, Alotaibi, and Lenon, 2017). Referral of chronically ill patients is crucial to the continuity of health care services where PHC does not have sufficient resources in terms of providers' skills, in-house medications, or medical devices (Senitan *et al*., 2017). According to published studies, there are high referral rates from PHC to acute care organizations; however, there are inadequate feedback reports (Al Wadaani and Balaha, 2012). Assessing other CCM domains in this study revealed reasonable support for delivery system design, clinical information systems, and integration. Comparing these domains with an earlier study in the USA, the Saudi health care system support for these domains is almost equal to American support (Noël *et al*., 2014).

On the other hand, a study from Korea showed lower support for the aforementioned domains. (Choi *et al*., 2014) However, supporting some CCM domains may bring timely improvements to chronic illness care (Sendall *et al*., 2017).Further studies are encouraged to have longitudinal approach in assessing diabetes disease management development in Saudi Arabia. Due to the fact current study is a cross-sectional, identifying causal relationships or improvement areas were not applicable.

Conclusion

The current study utilizing ACIC to assess diabetes disease management and services in Saudi PHC revealed reasonable implementations of the chronic care model. However, further studies are needed to provide a more in-depth assessment of each components of the CCM, including patients' perspectives and clinical indicators. Partnership with community organizations and Community programs are priorities for future studies within the Saudi primary healthcare context.

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