Analysis of the health service structure for the care of people with diabetes

Análise da estrutura de serviços de saúde para o cuidado às pessoas com diabetes

Análisis de estructura de los servicios de salud para el cuidado de personas con diabetes

ABSTRACT

Objective: To analyze the structure of basic health units for care of people with diabetes in the perspective of the chronicle conditions model. **Methods:** Transversal and exploratory study, conducted in 49 health services. An instrument based on the chronicle care model was applied. Descriptive analysis was performed. The interpretation was made by grades ranging from 0 to 100% and classification tracks that ranged from limited, basic, fair, and great. **Results:** The care structure was classified as basic. The components with the best and worst attributed grades were the service delivery system and decision support, respectively. It was observed a smaller availability of resources in units which act in the traditional model. **Conclusions:** Findings point to the need of optimizing the available resources for the improvement of work processes and invest in organizational goals, partnerships with the community, expert feedback, and training.

Descriptors: Chronic Disease; Diabetes Mellitus; Quality of Health Care; Primary Health Care; Evaluation of Research Programs and Tools.

RESUMO

Objetivo: Analisar a estrutura de unidades básicas de saúde para o cuidado às pessoas com diabetes na perspectiva do modelo de atenção às condições crônicas. **Métodos:** Estudo transversal e exploratório, realizado em 49 serviços de saúde. Aplicado instrumento baseado em cinco componentes do modelo de cuidados crônicos. Realizada análise descritiva dos resultados. A interpretação foi feita por faixas de pontuação entre 0 e 100% e quartis de classificações que variaram entre limitada, básica, razoável e ótima. **Resultados:** A estrutura para o cuidado foi classificada como básica. Os componentes com melhor e pior nota atribuída foram sistema de prestação de serviços e apoio à decisão, respectivamente. Observaram-se menor disponibilidade de recursos em unidades que atuavam no modelo tradicional. **Conclusões:** Os achados apontam para a necessidade de otimização dos recursos disponíveis para a melhoria dos processos de trabalho e investimento em metas organizacionais, parcerias com a comunidade, *feedback* do especialista e capacitação.

Descritores: Doença Crônica; Diabetes Mellitus; Qualidade Da Assistência à Saúde; Atenção Primária à Saúde; Avaliação de Programas e Instrumentos de Pesquisa.

RESUMEN

Objetivo: Analizar la estructura de las unidades básicas de salud para el cuidado de personas con diabetes desde la perspectiva del modelo de cuidado crónico. **Métodos:** Estudio transversal y exploratorio, realizado en 49 servicios de salud. Se aplicó un instrumento basado en cinco componentes del modelo de cuidados crónicos. Se realizó un análisis descriptivo de los resultados. La interpretación se realizó utilizando rangos de puntuación entre 0 y 100% y cuartiles de puntuación que van desde limitado, básico, regular y excelente. **Resultados:** La estructura para el cuidado se clasificó como básica. Los componentes con mejores y peores calificaciones fueron: sistema de prestación de servicios y apoyo a toma de decisiones, respectivamente. Hubo menor disponibilidad de recursos en unidades que operan en modelo tradicional. **Conclusiones:** Los resultados apuntan a la necesidad de optimizar recursos disponibles para mejorar procesos de trabajo e invertir en objetivos organizacionales, asociaciones comunitarias, *feedback* de especialistas y capacitación.

Descriptores: Enfermedad Crónica; Diabetes Mellitus; Calidad de la Atención de Salud; Atención Primaria de Salud; Evaluación de Programas e Instrumentos de Investigación.

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INTRODUCTION

In the last decade, the prevalence of diabetes mellitus (DM) has increased in low- and middle-income countries when compared to high-income countries. It is known that four out of five people with DM live in low- and middle-income countries. In 2017, approximately five million people between 20 and 99 years old died due to DM. It is noteworthy that about 1.8 million (36.5%) of those deaths occurred before 60 years old. In Latin America, it is estimated that 40% of people with DM do not know that they have the disease[1].

Likewise, in Brazil, recent data show an increase in the prevalence of DM diagnosis. According to a telephone survey on several health-related issues, conducted in 2019 with people over 18 years old in 26 capitals and in Federal District - known as *Vigilância de Fatores de Risco e Proteção para Doenças Crônicas por Inquérito telefônico* (VIGITEL) - 7.4% of the adult population said they have DM, that is, an increase of 74.3% when compared to 2006[2].

Thus, to cope with DM and other conditions, health care network in Brazil is structured from Primary Health Care (PHC), considered the main gateway and communication center of the health system, which coordinates care and orders the actions and services available in the network. In this context, PHC is divided into two categories: Basic Health Unit (BHU) and Family Health Unit (FHU). The FHU is considered a priority strategy for the expansion and consolidation of PHC, and the BHU are known as the traditional model which also have spontaneous demands and/or referrals. PHC teams are basically composed of physicians, preferably from family and community medicine specialty, nurses, preferably specialist in family health, nursing assistants and or nursing technicians. They may count with other professionals such as dentists, oral health assistants and/or oral health technicians, community health agents and agents to combat endemic diseases[3].

In order to develop effective and efficient actions aimed at the control of DM, PHC must have an adequate structure to ensure person-centered practices, correct functioning of referral and counter-referral mechanisms; professionals' knowledge regarding the flows of access to other healthcare centers; adequate training of teams, commitment of professionals to compliance with technical standards and with the expected results; adequate quantitative relationship of team/population and availability of equipment and other supplies[4]. A nationwide study found that, for every ten units of PHC in Brazil, not even one has an adequate structure for people with DM care[5].

Recent evidence of people with DM care management demonstrates better quality of care when it is planned in a proactive, interdisciplinary manner, centered on the person and their sociocultural context[6]. In this sense, the Chronic Care Model (CCM) proposes a reorganization of health condition management in order to obtain more satisfactory clinical results, continuous monitoring and development of the person's co-responsibility about their health[7].

This model has six elements, subdivided into two main dimensions: the first corresponds to the health care system that integrates five components: health care organization, design of the service delivery system, support for clinical decisions, clinical information system and supported self-care; the second dimension comprises the articulation with the community and its corresponding component are the resources of the community[7]. In Brazil, it has been adapted and incorporated into policies to cope with chronic health conditions since 2011[8].

Above all, the implementation of a new care model requires a previous step consisted of service structuring. On health services evaluation, the structure is one of the components for quality analysis, considering that appropriate structures increase the probability of professionals' good work process and, consequently, good results in users' health[9].

Despite the wide discussion, little is known about the relationship between the structure of PHC for DM care from the CCM perspective. To date, only one study has been found that evaluated the structure of PHC from the CCM perspective in Brazil[10]. Considering the above, the aim of this study was to analyze the structure of basic health units for people with diabetes care from the perspective of the chronic care model conditions in southern Brazil.

METHODS

It is a cross-sectional, quantitative and exploratory study.

The study scenario was the PHC in the municipality of Pelotas/RS, Brazil. The network of PHC services in Pelotas was established in the 1980s and currently consists of 51 BHU distributed in six administrative health districts (HD), five located in the urban area (HDI to HDV) and one in the rural area (HDVI).

The urban region of the municipality had 38 BHU, 25 of which adopted the FHU model, nine BHU worked in the traditional model and four were mixed (they apply two models of care: the FHU and the traditional model).

The rural region had 13 BHU, ten of which adopted the FHU model and three were traditional. The total coverage of the services and actions of the FHU teams corresponded to 69.2% of the population registered.

All the 51 BHU existing in the municipality were visited to present the objective of the study. However, two were excluded, one of them, located in the HDI, since, according to the team's report, the BHU began to provide secondary level care (for emergencies) since March 2017 and, therefore, the team considered they did not provide PHC and chose not to participate in the study. In the other health unit, located in the HDV, there was no doctor and the nurse had been in the service for less than a month, considered a period of setting and, therefore, refused to participate in the study. Thus, the scope of the study was 49 units, representing

96.1% of the BHU in the municipality.

For data collection, we used the instrument called Chronic Care Structure Assessment (CCSA), consisted of five components of the CCM: organization of the health system (nine questions), design of the service delivery system (18 questions), clinical information system (12 questions), clinical decision support (9 questions) and supported self-care (18 questions). Figure 1 shows the parts of the CCSA instrument, with its main components and evaluation criteria:

Figure 1 - Representative table of components and criteria of the CCSA instrument.

Components	Criteria
Organization of the health system	Evaluation of physicians' performance
	Evaluation of nurses' performance
	Evaluation of other professionals' performance
	Good practice encouragement
	Information on the rate of people with diabetes mellitus and A1c >7% or fasting glycemia >130 mg/dl
	Continuing education to improve clinical practice
	Continuing education to improve diabetes mellitus control
Design of the service delivery system	Scheduling system that informs the date of the next appointment
	Scheduling system for appointment with preferred professional
	Risk stratification system
	Interdisciplinary team
	Presence of a doctor on the team
	Presence of a nurse in the team
	Presence of nutritionist in the team
	Presence of social worker in the team
	Presence of a non-medical professional educator in the team
	Existence of clinical records
	Review of the medical records before the appointment
	Procedures planned before appointment
	List of people who missed the scheduled appointments
	Contact with people who missed the scheduled consultations
	Referral sheets
	Standardization of follow-up appointment time
	Standardization of first appointment time
Clinical information system	List of people with diabetes
	List of problems in the care of people with diabetes
	Flowcharts for attention to people with diabetes
	List of interventions to improve diabetes control
	Monitoring of laboratory tests
	Monitoring of electrocardiogram exams
	Monitoring of referrals to other services
	Electronic medical records
Clinical decision support	Clinical guidelines for diabetes
	Clinical guidelines according to age
	Reminders for diabetes-related health team
	Alert protocol of altered laboratory results for the team
	Alert protocol of altered laboratory results for patients
Supported self-care	Reminders for diabetes patients
	Self-care program for patients with diabetes
	Printed materials with diabetes information for patients
	Printed materials with smoking information for patients
	Printed materials with alcohol information for patients
	Printed materials with information about physical activity for patients
	Printed materials with information on healthy eating for patients
	Electronic materials with diabetes information for patients
	Electronic materials with hypertension information for patients
	Active search for diabetes
	Active search for hypertension
	Active search for dyslipidemia
	Active search for smoking
	Active search for alcohol abuse or dependence
	Active search for diabetic foot neuropathy

Source: Adapted[11]

CCSA was applied as a checklist by three trained researchers with the participation of the BHU manager. For each item present in the service, a score of 1 is assigned, and 0 when missing. The score of each component is obtained by dividing the sum of the items present in the service (numerator) by the total items expected for that component (denominator). The total CCSA score is calculated by the average of the five components and ranges from 0 to 100, in which, the higher the proportion obtained, the greater the availability of resources for implementation of the CCM in the service.

The interpretation of CCSA instrument was performed through classification ranges: the lowest score (percentage ≥ 0 and ≤ 25.4) corresponds to a unit with "limited" resources and structure for DM care; percentages ranging from ≥ 25.5 and ≤ 50.4 correspond to a unit with "basic" resources and

structure; percentages ranging from $\geq$ 50,5 and $\leq$ 75.4 correspond to a "reasonable" resource capacity and structure and percentages ranging from $\geq$ 75,5 and $\leq$ 100 correspond to a unit with "optimal" structure and resources for people with DM care.

The variables selected for this study were pre-coded, double-typed by independent digitizers in the EpiData version 3.1 program. After checking and correcting typos, the data was stored in SAS (Statistical Analysis System) version 9.3. Statistical analyses of absolute and relative frequency distribution were performed.

The ethical principles used in this study met the guidelines of resolution 466/12 created by the National Health Council[12]. The present study was submitted to the Research Ethics Committee of the Federal University of Pelotas and approved under opinion no. 2,403,534/2017 and CAAE no. 79860617.2.0000.5316.

RESULTS

Among the 49 health units included in the study, six (12.2%) were located in the health district (HD) I (one traditional and five FHU), six (12.2%) in the HDII (one traditional and five FHU), seven (14.3%) in the HDIII (three traditional, one mixed and three FHU), seven (14.3%) in the HDIV (two traditional, one mixed and four FHU), ten (20.4%) in the HDV (01 traditional, two mixed and seven FHU), 13 (26.5%) in the HDVI (three traditional and ten FHU).

The total number of professionals per specialty working in these units corresponded to 119 general practitioners, 25 specialist physicians, 92 nurses, 16 nutritionists, 07 psychologists, 13 pharmacists/pharmacy assistants, 41 social workers, 324 community health agents, 50 nursing technicians and 61 nursing assistants. The total target population is 260,761 inhabitants.

In general, the classification of the structure for people with DM care was classified as basic (46.7%). The evaluation of the structure revealed that no unit presented "optimal", only "basic" or "reasonable" classification. The component that obtained the highest average in the analysis of the municipality was "definition of the service delivery system" (59.2%), while "decision support" presented the worst average per municipality (40.8%).

The results found for each evaluated component are presented in the following tables, noting that the percentage (%) refers to the relative frequency represented by the number of units that have the criterion of structure available in the health establishment in relation to the total units of that HD.

Table 1 presents the distribution of the criteria found (present) in the component "health care organization" and their respective criteria evaluated per HD and the municipality.

Table 1 - Frequency of the criteria evaluated in the component "organization of health care" in the dimension structure for people with diabetes care in primary care, Pelotas - RS, December 2017 to July 2018. June 2019. (N = 49)

Health care organization	HD*I (N† =6)	HD II (N=6)	HD III (N=7)	HD IV (N=7)	HD V (N=10)	HD VI (N=13)	Total (N=49)
	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)
Performance evaluation for physicians	3 (50.0)	2 (33.3)	1 (14.3)	4 (57.1)	6 (60.0)	8 (61.5)	24 (49.0)
Performance evaluation for nurses	2 (33.3)	3 (50.0)	0 (0.0)	3 (42.9)	5 (50.0)	6 (46.2)	19 (38.8)
Performance evaluation for other professionals	2 (33,3)	2 (33.3)	0 (0.0)	2 (28.6)	5 (50.0)	6 (46.2)	17 (34.7)
Good practice encouragement	3 (50.0)	5 (83.3)	3 (42.9)	5 (71.4)	7 (70.0)	8 (61.5)	31 (63.3)
Rate information of people with decompensated diabetes	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	3 (23.1)	3 (6.1)
Continuing education to improve clinical practice	3 (50.0)	1 (16.6)	5 (71.4)	4 (57.1)	5 (50.0)	10 (76.9)	28 (57.1)
Continuing education to improve diabetes control	3 (50.0)	1 (16.6)	5 (71.4)	2 (28.6)	3 (30.0)	8 (61.5)	22 (44.9)

Legend: HD* = Health District; N† = Absolute frequency.

Source: the authors

Table 2 of this study presents the criteria of the structure component "design of the service delivery system" and their respective criteria evaluated per HDS and the municipality.

Table 2 - Frequency of the criteria evaluated in the component "design of the service delivery system" in the dimension structure for people with diabetes care in primary care, Pelotas- RS, December 2017 to July 2018. June 2019. (N = 49)

Design of the service delivery system	HD*I (N†=6)	HD II (N=6)	HD III (N=7)	HD IV (N=7)	HS V (N=10)	HD VI (N=13)	Total (N=49)
	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)
Planned scheduling system	4 (66.6)	4 (66.6)	4 (57.1)	5 (71.4)	6 (60.0)	7 (53.8)	30 (61.2)
Scheduling system by professional affinity	1 (16.6)	3 (50.0)	2 (28.6)	1 (14.3)	4 (40.0)	6 (46.2)	17 (34.7)
Risk rating	3 (50.0)	3 (50.0)	4 (57.1)	3 (42.9)	5 (50.0)	7 (53.8)	25 (51.0)
Interdisciplinary team	6 (100)	5 (83.3)	7 (100)	5 (71.4)	9 (90.0)	11 (84.6)	43 (87.8)
Doctor	6 (100)	6 (100)	7 (100)	7 (100)	10 (100)	13 (100)	49 (100)
Nurse	6 (100)	6 (100)	7 (100)	7 (100)	10 (100)	12 (92.3)	48 (98.0)
Nutritionist	1 (16.6)	2 (33.3)	1 (14.3)	4 (57.1)	8 (80.0)	0 (0)	16 (32.7)
Social Worker	4 (66,6)	5 (83.3)	7 (100)	6 (85.7)	10 (100)	9 (69.2)	41 (83.7)
Non-medical educator	1 (16.6)	1 (16.6)	4 (57.1)	4 (57.1)	6 (60.0)	5 (38.5)	21 (42.9)
Clinical records	6 (100.0)	6 (100)	7 (100)	7 (100)	10 (100)	13 (100)	49 (100)
Review of the medical records before the appointment	5 (83.3)	4 (66.6)	5 (71.4)	7 (100)	9 (90.0)	6 (46.2)	36 (73.5)
Procedures planned before appointment	3 (50.0)	3 (50.0)	4 (57.1)	2 (28.6)	6 (60.0)	8 (61.5)	26 (53.1)
Review of results after appointment	4 (66.6)	4 (66.6)	6 (85.7)	2 (28.6)	10 (100)	8 (61.5)	34 (69.4)
List of absence	2 (33.3)	1 (16.6)	2 (28.6)	2 (28.6)	5 (50.0)	6 (46.2)	18 (36.7)
Contact of absent people	2 (33.3)	1 (16.6)	3 (42.9)	2 (28.6)	6 (60.0)	7 (53.8)	19 (38.8)
Referral sheets	1 (16.6)	3 (50.0)	5 (71.4)	4 (57.1)	7 (70.0)	10 (76.9)	28 (57.1)
Standardization of follow-up appointment time	1 (16.6)	0 (0)	1 (14.3)	3 (42.9)	0 (0)	4 (30.8)	9 (18.4)
Standardization of first appointment time	1 (16.6)	0 (0)	1 (14.3)	4 (57.1)	0 (0)	4 (30.8)	10 (20.4)

Legend: HD* = Health District; N† = Absolute frequency.

Source: the authors

Table 3 presents the criteria for the structure of the "clinical information system" component and their respective criteria evaluated per HD and the municipality.

Table 3 - Frequency of the criteria evaluated in the "clinical information system" component in the dimension structure for people with diabetes care in primary care Pelotas - RS, December 2017 to July 2018. June 2019. (N = 49)

Clinical information system	HD*I (N† =6)	HD II (N=6)	HD III (N=7)	HD IV (N=7)	HD V (N=10)	HD VI (N=13)	Total (N=49)
	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)
List of people with diabetes	4 (66.6)	3 (50.0)	4 (57.1)	3 (42.9)	8 (80.0)	12 (92.3)	34 (69.4)
List of problems	1 (16.6)	3 (50.0)	1 (14.3)	3 (42.9)	5 (50.0)	8 (61.5)	21 (42.9)
Algorithms and flowcharts	1 (16.6)	2 (33.3)	1 (14.3)	1 (14.3)	2 (20.0)	3 (23.1)	10 (20.4)
List of interventions	1 (16.6)	3 (50.0)	2 (28.6)	1 (14.3)	2 (20.0)	9 (69.2)	18 (36.7)
Monitoring of lab tests	2 (33.3)	0 (0)	3 (42.9)	3 (42.9)	6 (60.0)	5 (38.5%)	19 (38.8)
Monitoring of electrocardiograms	2 (33.3)	0 (0)	2 (28.6)	2 (28.6)	4 (40.0)	5 (38.5%)	15 (30.6)
Monitoring of referrals	2 (33.3)	4 (66.6)	3 (42.9)	2 (28.6)	7 (70.0)	9 (69.2)	27 (55.1)
Electronic medical records	5 (83.3)	6 (100)	7 (100)	7 (100)	10 (100)	12 (92.3)	47 (95.9)

Legend: HD* = Health District; N† = Absolute frequency.

Source: the authors

Table 4 presents the criteria for the structure of the "clinical decision support" component and their respective criteria evaluated per HD and the municipality.

Table 4 - Frequency of the criteria evaluated in the "clinical decision support" component in the dimension structure for people with diabetes care in primary care Pelotas - RS, December 2017 to July 2018. June 2019. (N = 49)

Clinical decision support	HD*I (N† =6)	HD II (N=6)	HD III (N=7)	HD IV (N=7)	HD V (N=10)	HD VI (N=13)	Total (N=49)
	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)
Clinical guidelines for diabetes	3 (50.0)	5 (83.3)	4 (57.1)	5 (71.4)	8 (80.0)	12 (92.3)	37 (75.5)
Clinical guidelines according to age	1 (16.6)	4 (66.6)	3 (42.9)	2 (28.6)	4 (40.0)	6 (46.2)	20 (40.8)
Reminders for the team	2 (33.3)	1 (16.6)	3 (42.9)	1 (14.3)	4 (40.0)	7 (53.8)	18 (36.7)
Alert for altered lab exams (team)	2 (33.3)	1 (16.6)	2 (28.6)	0 (0)	5 (50.0)	4 (30.8)	14 (28.6)
Alert for altered lab exams (patient)	1 (16.6)	1 (16.6)	2 (28.6)	0 (0)	3 (30.0)	4 (30.8)	11 (22.4)

Legend: HD* = Health District; N† = Absolute frequency.

Source: the authors

Table 5 presents the criteria for the structure of the "supported self-care" component and their respective criteria evaluated per HD and the municipality.

Table 5 - Frequency of the criteria evaluated in the "supported self-care" component in the dimension structure for people with diabetes care in primary care Pelotas - RS, December 2017 to July 2018. June 2019. (N = 49)

Supported self-care	HD*I (N† =6)	HD II (N=6)	HD III (N=7)	HD IV (N=7)	HD V (N=10)	HD VI (N=13)	Total (N=49)
	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)
Reminders for patients	2 (33.3)	2 (33.3)	2 (28.6)	2 (28.6)	4 (40.0)	6 (46.2)	18 (36.7)
Self-care program	2 (33.3)	4 (66.6)	2 (28.6)	2 (28.6)	3 (30.0)	10 (76.9)	23 (46.9)
Brochure/banner about diabetes	3 (50.0)	4 (66.6)	5 (71.4)	4 (57.1)	6 (60.0)	11 (84.6)	33 (67.3)
Brochure/banner about smoking	5 (83.3)	4 (66.6)	5 (71.4)	6 (85.7)	9 (90.0)	10 (76.9)	39 (79.6)
Brochure/banner about alcohol	4 (66.6)	1 (16.6)	4 (57.1)	4 (57.1)	4 (40.0)	9 (69.2)	26 (53.1)
Brochure/banner about physical activity	5 (83.3)	3 (50.0)	4 (57.1)	2 (28.6)	4 (40.0)	4 (30.8)	22 (44.9)
Brochure/banner about healthy eating	4 (66.6)	1 (16.6)	4 (57.1)	6 (85.7)	7 (70.0)	10 (76.9)	32 (65.3)
Electronic materials about diabetes	4 (66.6)	1 (16.6)	2 (28.6)	1 (14.3)	2 (20.0)	6 (46.2)	16 (32.7)
Diabetes active search	3 (50.0)	3 (50.0)	3 (42.9)	2 (28.6)	7 (70.0)	10 (76.9)	28 (57.1)
Hypertension active search	3 (50.0)	0 (0)	1 (14.3)	2 (28.6)	6 (60.0)	6 (46.2)	29 (59.2)
Dyslipidemia active search	3 (50.0)	3 (50.0)	3 (42.9)	2 (28.6)	8 (80.0)	10 (76.9)	18 (36.7)
Smoking active search	3 (50.0)	1 (16.6)	0 (0)	1 (14.3)	7 (70.0)	4 (30.8)	16 (32.7)
Alcohol abuse active search	2 (33.3)	1 (16.6)	1 (14.3)	1 (14.3)	4 (40.0)	5 (38.5)	14 (28.6)
	3 (50.0)	1 (16.6)	0 (0)	0 (0)	0 (0)	1 (7.7)	5 (10.2)

Legend: HD* = Health District; N† = Absolute frequency.

Source: the authors

DISCUSSION

The evaluation of the structure of PHC showed wide variability in the distribution of physical, human and material resources. On the one hand, the National Program of Access and Quality Improvement, electronic medical records and multidisciplinary staff stood out as present resources in most units. On the other hand, there were failures in the identification, recording and follow-up of risk factors for DM. Moreover, the health units that worked in the FHU model had better availability of resources for the care of people with DM from the perspective of the CCM.

The variability of results found in this study can be explained by two factors: the presence of a mixed model of health care and different organizational links in the different health units. In relation to the first factor, it was found that PHC in the studied region also coexists with a mixed model

of health care – the FHU – considered a strategy for transforming the care model, with a proposal to replace traditional care practices – and the BHU, a traditional model[3-4]. In addition, the second factor identified was the existence of three different organizational links in health units, including: Municipal Health Department, Public University and Private University. It was observed that the varied organizational links reflected in different leadership figures, absence of global health goals for the municipality and difficulties in information management, including successful experiences exchange between the units.

In this sense, the main obstacle related to the "organization" component was a lack of information on the real prevalence of people with decompensated DM in the municipality, to facilitate health actions planning. It is known that decompensated DM significantly increases the risk

of heart disease and health expenditures related to the disease are predominantly to control cardiovascular complications. Thus, the main objective in the treatment of DM is to reduce cardiovascular morbidity and mortality. Therefore, risk stratification of people with DM is the initial stage for the organization of health services[13].

Also, still about the criteria for organizing care, a failure in "performance evaluation" was observed, especially among nurses and other non-medical professionals. The literature shows that continuous feedback is an important tool for managing clinical practice related to DM[14].

Likewise, the criterion "good practices encouragement" was present in 63.3% of health units. Among them, 46.9% cited the Program of Access and Quality Improvement (PAQI) and 8.2% cited productivity reports as a source of encouragement, while the other 44.9% units did not identify a program to encourage good practices. A nationwide study conducted in Brazil showed that, after the implementation of the PAQI, the proportion of units with adequate structure for the care of people with DM in PHC doubled. On the other hand, the findings of this study disagree with the current one regarding the better classification of the structure of the units used in the FHU model compared to the units that worked in the traditional model[5].

Regarding the component "design of the service delivery system", it was found that it obtained the best evaluation compared to the other components of the CCM. The main criterion that contributed to the high score was the presence of an interdisciplinary team (nurse, doctor and social worker) in most health units. This is supported by a study that demonstrated that the multidisciplinary approach in PHC improves the control of DM and its risk factors[15]. Also referring to the same component, this study found as a negative criterion to highlight the low rate of active search for people who missed scheduled appointments. This finding was similar in another study conducted in southern Brazil, confirming that the active search for PHC was unsatisfactory, especially in traditional units as also found in this study. This finding revealed the need for reorientation of PHC, insertion of community agents in all health units and professional training[16].

The criterion of the "clinical information system" component that obtained greater relevance was the presence of electronic medical records in 95.9% of the units in the municipality. Despite the wide availability of medical records in electronic format and the ease of registration associated with this technology, it was found that only 69.4% of the units had a record of the diabetic population registered in the unit. This is a worrying fact considering that data routinely inserted into the electronic medical records would provide an automatic report and the team could have access to the list of people with DM and some associated risk factors such as hypertension and obesity in each area of coverage.

In this sense, it can be observed that the improvement of the structure of services represented by the availability of electronic medical records in the units did not a ensure the qualification of organization processes and management of care, since they depend on the support of professionals, therefore, on the investment of management in continuous training, supervision and feedback[14,17].

It was found that "clinical decision support" obtained the worst classification in relation to the other components of the CCM. Above all, a positive aspect observed was the presence of clinical guidelines for the treatment of DM in 75.5% units. On the other hand, a negative aspect that stood out in this component was the absence of monitoring tools, such as alerts of altered laboratory tests for both the team and patients. A similar study conducted in southeastern Brazil that corroborates this fact found that the participation of the specialist as a decision support in PHC, in most cases, was limited to referring the patient through the referral, without a written counter-referral and let alone the participation of the specialist in PHC professionals training [18].

In this sense, a previous study also pointed out the need to implement a matrix support device, to establish a new type of interrelationship between the PHC team and the specialist so that the line of care for chronic diseases was made possible in an articulated network of services, in a permanent and articulated discussion of work processes, aiming at a fundamental and close collaboration between the specialist and basic level[19].

Regarding the "supported self-care" component, it was found that the main problem identified was the absence of tools for active search, especially for diabetic neuropathy. Current clinical evidence strongly suggested that one of the indicators of people with DM follow-up in PHC included screening for diabetic neuropathy using the 10g monofilament, which represents a low cost technology of high predictive value in the evaluation of plantar sensitivity loss and prevention of diabetic foot[20].

Thus, the evaluation criteria in the structure dimension that presented the greatest failures in the units were mainly characterized by the lack of information about the prevalence of people with uncontrolled DM in health units, and, linked to this issue, there was no objective risk classification tools, lack of specific training to improve DM control and low rates of performance evaluation of professionals, nurses and other non-medical professionals. At the same time, there was a lack of objective tools for active monitoring and search of risk conditions associated with DM such as smoking and diabetic neuropathy.

Corroborating, a study conducted in 34% of PHC in the country found that, in 2014, only eight percent of the units had all the materials necessary for good quality care to the person with DM. Likewise, about 23.3% of the units presented adequate physical structure for DM care. It is noteworthy that in less than one third of the units there were specific materials, such as

ophthalmoscope and monofilament kit. Such findings may represent a gap in the education of health professionals, due to the lack of interest in performing these tests (eyes and feet) in PHC, since they can be referred to a specialist[5].

In this sense, the results of the current study are consistent with the national reality. It should be noted that there are no studies in southern Brazil that evaluate the structure of PHC for the care of people with DM from CCM perspective. Thus, this study filled a gap in the literature and contributed to provide an overview of this situation. A limitation of the present study can lie on the fact that the instrument was only applied to the manager, without including the consensus of other professionals working in the PHC units. To minimize this situation was minimized the items verification was performed together with the researchers on-site.

CONCLUSION

Combined, the findings of this study point to the need to optimize the resources available for work processes improvement. It was highlighted that although there were already many technologies available for the care of chronic patients (electronic medical records, technical health) in health units, they were still underused, either due to resistance to innovation or lack of training for their use.

On the other hand, other resources were considered of low technological density and low cost, such as: evidence-based clinical guidelines; the use of motivational interviews care technology for behavior change and the 10g monofilament that could be incorporated into the practice of professionals, as a possibility to improve the interaction between the health professional and the person with DM and increase the institutional capacity to care for people with DM in the municipality.

According to the findings of this study there is a need to invest, mainly in: clear definition of organizational goals and criteria for the transfer of financial and motivational incentives; establishing partnerships between health unit and community; articulation of local health councils; improved expert feedback on counter-referral and implementation of continuing education in service.

The CCSA instrument proved useful to identify the categories of CCM that require intervention to improve the care capacity of people with DM in each health unit. Based on the results of this study, a situational diagnosis was established with the definition of priority criteria, so that managers and professionals working in PHC can draw up an assertive intervention plan. Considering that the nursing professionals are those who, in most cases, assume the management of the units, the importance of these professionals in the evaluation of available resources and actions performed is evident. Above all, improvements depend on the engagement of all actors involved: government leaders; health managers; professionals from different levels of care; users; family; and community.

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