REVISTA BRASILEIRA DE MEDICINA DE FAMÍLIA E COMUNIDADE
RBMFC

www.rbmfc.org.br
ISSN 2179-7994

Research Article

Quality indicators of care for users with diabetes in Primary Health Care in Brazil: 2012 and 2018

Indicadores de qualidade da atenção a usuários com diabetes na Atenção Primária à Saúde do Brasil: 2012 e 2018

Indicadores de calidad de la atención a usuarios con diabetes en Atención Primaria de Salud en Brasil: 2012 y 2018

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Abstract

Introduction: Diabetes Mellitus (DM) is a non-communicable chronic disease whose prevalence has been increasing worldwide. Its adequate management in Primary Health Care (PHC) can reduce complications and hospitalizations for conditions sensitive to primary care. **Objective:** To compare quality indicators for the care of people with diabetes treated in the basic health network in Brazil and their differences by region. **Methods:** With a cross-sectional design, data from Cycles I and III of the PMAQ were used. The outcomes were synthetic indicators, operationalized from 24 variables: i) access; ii) availability of supplies and equipment in usable conditions; iii) availability of medications in sufficient quantities; iv) organization and management; v) clinical care; and vi) report of adequate care. Differences in percentage points (p.p.) of the indicators between 2012 and 2018 were calculated, and the data were stratified by region. **Results:** Overall, there was an improvement in the care of people with DM in PHC in Brazil and regions among the teams participating in PMAQ, between 2012 and 2018. The prevalence of access, availability of supplies/equipment, medications, demand, organization, and management showed an increase of at least 10 p.p. within six years, but they can improve. **Conclusions:** Considering that the occurrence of DM is increasing in the country, greater investment is necessary in the structure of services and in continuing education programs for health professionals.

Keywords: Diabetes mellitus; Health services research; Quality indicators, health care; Primary Health Care; Cross-sectional studies.

Corresponding author:
Elaine Tomasi
E-mail: tomasiet@gmail.com
Funding:
No external funding.
Ethical approval:
2.453.320
Informed Consent:
Not applicable.
Provenance:
Not commissioned.
Peer review:
external.
Received: 02/15/2023.
Approved: 09/02/2024.

How to cite: Tomasi E, Silveira DS, Neves RG, Thumé E, Cesar MADC, Barros NBR, Facchini LA. Quality indicators of care for users with diabetes in Primary Health Care in Brazil: 2012 and 2018. Rev Bras Med Fam Comunidade. 2024;19(46):3678. https://doi.org/10.5712/rbmfc19(46)3678

Resumo

Introdução: Diabetes *mellitus* (DM) é uma doença crônica, não transmissível, cuja prevalência tem aumentado mundialmente. Seu manejo adequado na Atenção Primária à Saúde (APS) pode reduzir suas complicações e as internações por condições sensíveis à atenção primária. **Objetivo:** Comparar indicadores de qualidade da atenção a pessoas com diabetes atendidas na rede básica de saúde do Brasil e suas diferenças por região. **Métodos:** Com delineamento transversal, utilizaram-se dados dos Ciclos I e III do Programa de Melhoria do Acesso e da Qualidade (PMAQ). Os desfechos foram indicadores sintéticos, operacionalizados a partir de 24 variáveis: i) acesso; ii) disponibilidade de insumos e equipamentos em condições de uso; iii) disponibilidade de medicamentos em quantidade suficiente; iv) organização e gestão; v) cuidado clínico; e vi) relato de cuidado adequado. Foram calculadas as diferenças em pontos percentuais (p.p.) dos indicadores entre 2012 e 2018, e os dados foram estratificados por região. **Resultados:** No geral, houve uma melhora no cuidado à pessoa com DM na APS do Brasil e regiões entre as equipes participantes do PMAQ, entre 2012 e 2018. As prevalências de acesso, disponibilidade de insumos/equipamentos, medicamentos, oferta, organização e gestão apresentaram aumento de, no mínimo, 10 p.p. no período de 6 anos, mas podem melhorar. **Conclusões:** Considerando que a ocorrência de DM está aumentando no país, faz-se necessário maior investimento na estrutura dos serviços e em programas de educação permanente dos profissionais de saúde.

Palavras-chave: Diabetes mellitus; Pesquisa sobre serviços de saúde; Indicadores de qualidade em assistência à saúde; Atenção Primária à Saúde; Estudos transversais.

Resumen

Introducción: La Diabetes Mellitus es una enfermedad crónica no transmisible cuya prevalencia ha aumentado en todo el mundo. Su manejo adecuado en la Atención Primaria puede reducir sus complicaciones y las hospitalizaciones por afecciones sensibles a la Atención Primaria. **Objetivo:** comparar indicadores de calidad de la atención a personas con diabetes atendidas en la red básica de salud de Brasil y sus diferencias por región. **Métodos:** Con delineamiento transversal, se utilizaron datos de los Ciclos I y III del PMAQ. Los defectos fueron indicadores sintéticos, operacionalizados a partir de 24 variables: i) acceso, ii) disponibilidad de insumos y equipos en condiciones utilizables, iii) disponibilidad de medicamentos en cantidad suficiente, iv) organización y gestión, v) atención clínica y vi) reporte de atención adecuada. Se calcularon las diferencias en puntos porcentuales (p.p.) de los indicadores entre 2012 y 2018, y los datos se estratificaron por regiones. **Resultados:** En general, hubo una mejora en la atención a las personas con DM en APS en Brasil y regiones entre los equipos participantes en el PMAQ entre 2012 y 2018. La prevalencia del acceso, la disponibilidad de insumos/equipos, los medicamentos, el suministro, la organización y la gestión mostraron un aumento de al menos 10 p.p. en el periodo de seis años, pero pueden mejorar. **Conclusiones:** Considerando que la ocurrencia de DM está aumentando en el país, es necesario invertir más en la estructura de los servicios y en programas de educación continuada para los profesionales de salud.

Palabras clave: Diabetes mellitus; Investigación sobre servicios de salud; Indicadores de calidad de la atención de salud; Atención Primaria de Salud; Estudios transversales.

INTRODUCTION

Diabetes mellitus (DM) is a noncommunicable chronic disease (NCD) with a growing prevalence worldwide. In 2017, approximately 8.4% of adults aged 18 to 99 were affected, with projections indicating that this figure could rise to 9.9% by 2045.[1] In Brazil, data from the National Health Survey (*Pesquisa Nacional de Saúde* – PNS) reveal that the prevalence of DM was 6% in 2013 and increased to 8% in 2019.[2] These estimates vary by age and socioeconomic status (SES), being more common among the aged and individuals with low SES.[3] DM is associated with various comorbidities, including high blood pressure (HBP) and dyslipidemia,[3] and can result in years of life lost due to disability, as well as cardiovascular and cerebrovascular complications, leading to increased mortality.[1,4]

Proper management of DM in Primary Health Care (PHC) can significantly reduce hospitalizations for primary care-sensitive conditions (HPCSC) and complications associated with the disease, such as amputations, blindness, and kidney issues.[5-7] This potential stems from the inherent attributes of PHC, which enable effective care for individuals with DM and its complications through health promotion, disease prevention, diagnosis, treatment, and rehabilitation activities.[8] Consequently, PHC services must be equipped to meet the increasing demand for ongoing care in a qualified manner.[2,8]

Given the rising prevalence of DM in the country,[2,9] it is essential to assess the care provided by health teams to patients. Monitoring indicators will help analyze the impact of public policies and efforts aimed at expanding the availability and enhancing the quality of care offered to at-risk individuals.[10]

The Access and Quality Improvement Program (*Programa de Melhoria do Acesso e da Qualidade* – PMAQ) evaluated the country's Primary Health Care (PHC) services under the Ministry of Health (MoH) from 2012 to 2018, aiming to enhance the network through the voluntary participation of health teams. These teams received financial incentives based on their performance regarding the evaluated indicators.[11] Following the phases of participation, contracting, and monitoring, PHC health teams underwent an external assessment visit to verify on-site quality standards. This phase marked an unprecedented investigation of PHC in Brazil across three levels: Basic Health Units (*Unidade Básica de Saúde* – UBS), Family Health Strategy (FHS) teams, and users.[11]

The objective of this article was to compare the prevalence of quality indicators for diabetes care in the basic health network between 2012 and 2018, examining regional differences.

METHODS

This study utilized a cross-sectional design and is based on the external evaluation phase of the health teams participating in Cycles I and III of the PMAQ, conducted in 2012 and 2018, respectively. The evaluation was coordinated by 41 Brazilian higher education institutions, led by Fundação Oswaldo Cruz (Fiocruz), Universidade Federal da Bahia (UFBA), Universidade Federal de Minas Gerais (UFMG), Universidade Federal de Pelotas (UFPel), Universidade Federal do Piauí (UFPI), Universidade Federal do Rio Grande do Sul (UFRGS), Universidade Federal do Rio Grande do Norte (UFRN), and Universidade Federal de Sergipe (UFS).

Data collection occurred from May to December 2012 (Cycle I) and from July 2017 to August 2018 (Cycle III), conducted by trained interviewers using electronic instruments on tablets. The instruments comprised three modules: I – Structure – observation at the UBS, focusing on questions regarding infrastructure; II – Health Teams – interviews with a higher education professional about the team's work process; and III – Users – interviews with users present at the UBS on the day of the assessment. Inclusion criteria for this study's analysis included having a medical diagnosis of DM, being present at the UBS on the assessment day, being 18 years old or older, not being the first patient attended at the unit, and having utilized the service within the last 12 months.

To evaluate the quality of care provided to individuals with a medical diagnosis of DM, six synthetic indicators were established, operationalized based on 24 variables (Chart 1):

i) Access;
ii) Availability of supplies and equipment in usable conditions;
iii) Availability of medications in sufficient quantities;
iv) Organization and management;
v) Clinical care;
vi) Report of adequate care.

The proportions of positive responses to all 24 questions comprising the six synthetic indicators, along with their respective 95% confidence intervals (95%CI), were compared between Cycles I and III, and the differences were calculated in percentage points (p.p.). Additionally, the prevalence of the six

Chart 1. Variables that composed the synthetic indicators according to the module of the external evaluation instrument. Access and Quality Improvement Program – Universidade Federal de Pelotas, 2012 and 2018.

Synthetic indicator/ operationalization	Characteristics	Module of the instrument
Access Both responses positive	Consultation in the last 6 months at the UBS (yes; no)	Users
	Less than 3 days to the first consultation (yes; no)	Team
Availability of supplies and equipment in usable conditions All eight supplies and equipment available	Sphygmomanometer Stethoscope Scale Measuring tape Ophthalmoscope Monofilament kit Glucometer Capillary blood glucose strips	Structure
Availability of medications in sufficient quantities All four medications available	Glibenclamide Metformin NPH insulin Regular insulin	Structure
Organization and management All five responses positive	Does the team use any registration form for people with diabetes? (yes; no)	Team
	Does the team have records of users at higher risk/severity? (yes; no)	
	Does the team coordinate the waiting list for users needing consultations and exams at other points of care? (yes; no)	
	Does the team schedule consultations and exams based on case stratification? (yes; no)	
	Do you leave the consultation with the next appointment scheduled? (yes; no)	Users
Clinical care Both responses positive	Does the team perform periodic diabetic foot examinations on users? (yes; no)	Team
	Does the team perform periodic fundus examinations? (yes; no)	
Report of adequate care All three responses positive	Have you had a fasting blood test in the last 6 months? (yes; no)	Users
	Have your feet been examined in the last 6 months? (yes; no)	
	Has any healthcare professional advised you on foot care? (yes; no)	

synthetic indicators was compared. These indicators were further stratified by region (North, Northeast, Southeast, South, and Midwest). The analyses were conducted using Stata software (StataCorp. 2015. Stata Statistical Software: Release 15. College Station, TX: StataCorp LP).

The studies were submitted to and approved by the UFPel Research Ethics Committee, receiving favorable opinions through official letters 38/2012 on May 10, 2012 (Cycle I), and 2.453.320 on December 27, 2017 (Cycle III). All interviewees signed the Informed Consent, indicating that they were adequately

informed about the research topic, the guarantee of secrecy and confidentiality of the information provided, and their right to refuse participation in the study at any time.

RESULTS

In cycle I, 65,391 users linked to 17,202 teams in 13,842 UBS were interviewed. In cycle III, there were 140,444 users, 37,350 teams, and 28,939 UBS. The number of users reporting a medical diagnosis of DM was 8,118 in Cycle I and 17,641 in Cycle III, representing 12.5% (95%CI 12.2–12.8) and 12.6% (95%CI 12.4–12.8) of the total number of interviewees in each cycle, respectively. Of these, 88.9% (n=7,223; Cycle I) and 86.4% (n=15,245; Cycle III) had a consultation in the last 6 months.

The proportion of users who consulted the UBS in the last 6 months increased by 3.7 p.p., from 87.3% to 91.0% during the analyzed period. There was a significant increase in the proportion of users who waited less than 3 days for their first consultation, rising from 48.3% (Cycle I) to 60.7% (Cycle III). These two conditions formed the access indicator, which increased by approximately 10 p.p., from 42.9% in 2012 to 52.7% in 2018 (Table 1).

Regarding the availability of supplies and equipment in usable condition, it was observed that all items showed growth, even those that were already present in nearly 100% of the UBS, such as sphygmomanometers, stethoscopes, scales, tape measures, glucometers, and capillary glucose strips. Notably, the availability of ophthalmoscopes increased (19.4 p.p.) and monofilament kits increased by 10.6 p.p., although neither reached half of the Primary Care services. Overall, the availability of supplies and equipment for the care of people with diabetes rose from 9.9% in 2012 to 23.3% in 2018 (13.4 p.p.; Table 1).

Among the drugs available in sufficient quantity, the greatest increases in the UBS between the years were observed for regular insulin (21.9 p.p.), NPH insulin (20.6 p.p.), and metformin (16 p.p.). The presence of the four drugs investigated rose from 41% in Cycle I to 50.4% in Cycle III (9.4 p.p.; Table 1).

Regarding the quality of service, particularly in the organization and management of care, the most significant improvements were in the coordination of teams concerning the waiting list for users needing consultations and exams at other care points (30.4 p.p.) and in maintaining a record of users with higher risk/severity (26.1 p.p.). The synthetic indicator for these five items increased from 12.6% in 2012 to 27.7% in 2018 (15.1 p.p.). Conversely, the periodic performance of fundus examinations decreased from 45.5% in 2012 to 33.8% in 2018 (-11.7 p.p.). In contrast, the proportion of teams conducting periodic diabetic foot exams increased from 60.1% in the first cycle to 82.1% in the third cycle (22 p.p.). Overall, the supply measured through these two variables decreased by 3.1 p.p., from 35.2% in 2012 to 32.1% in 2018 (Table 1).

According to users, 92.9% reported having had a blood test in the last 6 months in 2012, decreasing to 91.3% in 2018 (-1.6 p.p.). Foot examinations were reported by 32.7% of respondents in 2012 and increased to 37.8% in 2018 (5.1 p.p.). Guidance received from professionals on foot care was provided to approximately half of the users: 48.9% in 2012 and 50.4% in 2018 (1.5 p.p.). Overall, reports of adequate care, measured by these three variables, increased slightly from 26.2% in 2012 to 29.7% in 2018 (3.5 p.p.; Table 1).

In all synthetic indicators, differences were noted between 2012 and 2018, with the only decrease in proportions occurring in the provision of clinical care by teams. The analysis by macro-region confirmed this trend across all regions of Brazil. Access to health services and the availability of supplies, equipment,

Table 1. Distribution of quality indicators for the care of people with diabetes mellitus in Cycles I and III of the Access and Quality Improvement Program. Brazil, external evaluation of the Access and Quality Improvement Program, 2012 (n=6,309) and 2017/2018 (n=13,875).

Indicator	Items and operationalization	Cycle I 2012 % (95%CI)	Cycle III 2017/2018 % (95%CI)	Difference (p.p.)
Access	Consultation in the last six months at the UBS	87.3 (86.4–87.9)	91 (90.6–91.6)	3.7
	Less than 3 days to the first consultation	48.3 (47.2–49.4)	60.7 (60.0–61.5)	12.4
	Both responses positive	**42.9 (41.9–44.1)**	**52.7 (51.9–53.4)**	**9.8**
Availability of supplies and equipment	Sphygmomanometer	98.9 (98.6–99.1)	99.6 (99.5–99.7)	0.7
	Stethoscope	98.4 (98.1–98.7)	99.6 (99.5–99.7)	1.2
	Scale	95.7 (95.2–96.2)	98.7 (98.5–98.9)	3.0
	Measuring tape	94.1 (93.5–94.7)	97.5 (97.2–97.8)	3.4
	Ophthalmoscope	21.2 (20.2–22.2)	40.6 (39.8–41.4)	19.4
	Monofilament kit	36.2 (35.0–37.4)	46.8 (45.9–47.6)	10.6
	Glucometer	96.5 (96.0–96.9)	98.4 (98.2–98.6)	1.9
	Capillary blood glucose strips	87.7 (87.2–89.3)	96.9 (96.6–97.2)	9.2
	All eight supplies and equipment available	**9.9 (9.3–10.6)**	**23.3 (22.7–23.9)**	**13.4**
Availability of medications	Glibenclamide	73.6 (72.5–74.7)	80.1 (79.4–80.8)	6.5
	Metformin	71.1 (69.9–72.2)	87.1 (86.5–87.7)	16.0
	NPH insulin	51.5 (50.3–52.7)	72.1 (71.3–72.8)	20.6
	Regular insulin	48.3 (47.1–49.5)	70.2 (69.4–70.9)	21.9
	All four medications available	**41.0 (39.8–42.2)**	**50.4 (49.6–51.2)**	**9.4**
Organization and management	Does the team use any registration form for people with diabetes?	93.5 (92.9–94.1)	92.5 (92.0–92.9)	-1.0
	Does the team have records of users at higher risk/severity?	56.9 (55.7–58.1)	83.0 (82.4–83.6)	26.1
	Does the team coordinate the waiting list for users needing consultations and exams at other points of care?	51.6 (50.4–52.8)	82.0 (81.4–82.6)	30.4
	Does the team schedule consultations and exams based on case stratification?	78.9 (77.9–79.9)	92.7 (92.3–93.1)	13.8
	Do you leave the consultation with the next appointment scheduled?	36.7 (35.5–37.9)	42.5 (41.7–43.3)	5.8
	All five responses positive	**12.6 (11.8–13.3)**	**27.7 (27.0–28.4)**	**15.1**
Clinical care	Does the team perform periodic diabetic foot examinations on users?	60.1 (58.9–61.3)	82.1 (81.5–82.7)	22.0
	Does the team perform periodic fundus examinations?	45.5 (44.3–46.7)	33.8 (33.0–34.6)	-11.7
	Both responses positive	**35.2 (34.0–36.4)**	**32.1 (31.3–32.9)**	**-3.1**
Report of adequate care	Have you had a fasting blood test in the last 6 months?	92.9 (92.2–93.5)	91.3 (90.8–91.8)	-1.6
	Have your feet been examined in the last 6 months?	32.7 (31.5–33.9)	37.8 (36.9–38.6)	5.1
	Has any healthcare professional advised you on foot care?	48.9 (47.7–50.1)	50.4 (49.6–51.2)	1.5
	All three responses positive	**26.2 (25.2–27.1)**	**29.7 (29.0–30.4)**	**3.5**

95%CI: 95% confidence interval; p.p.: percentage points.

and medicines saw the most significant increases in the Northeast and Central-West regions. Additionally, the Northeast region experienced a notable rise in the indicators of organization and management, as well as reporting of adequate care. The decline in the clinical care indicator in the Southeast and South regions, with reductions of -10 p.p. and -5 p.p., respectively, likely contributed to the negative overall result observed across Brazil (Tables 2 and 3).

Table 2. Quality indicators for the care of people with diabetes related to access and structure of the Basic Health Unit according to the macro-regions of Brazil. External evaluation of the Access and Quality Improvement Program – 2012 and 2017/2018.

	Access % (95%CI)		Availability of supplies/ equipment % (95%CI)		Availability of medications % (95%CI)	
	Cycle I	Cycle III	Cycle I	Cycle III	Cycle I	Cycle III
North	53.4 (49.8–59.0)	56.9 (53.5–60.2)	2.5 (1.1–4.9)	14.1 (11.8–16.6)	34.8 (29.6–40.3)	38.7 (35.5–42.1)
Northeast	44.9 (42.5–47.3)	60.7 (59.3–62.1)	1.8 (1.2–2.6)	18.3 (17.2–19.4)	22.5 (20.5–24.6)	45.5 (44.1–46.9)
Central-West	57.6 (53.7–61.4)	68.1 (65.5–70.6)	4.9 (3.4–6.9)	26.6 (24.3–29.1)	36.4 (32.7–40.3)	59.5 (56.8–62.1)
Southeast	38.7 (37.2–40.2)	44.5 (43.4–45.6)	16.9 (15.8–18.1)	31.9 (30.9–33.0)	45.2 (43.7–46.7)	53.2 (52.1–54.3)
South	43.8 (40.0–46.7)	52.7 (50.8–54.6)	1.8 (1.1–2.7)	9.5 (8.4–10.6)	45.7 (42.8–48.6)	53.3 (51.4–55.2)

95%CI: 95% confidence interval.

Table 3. Quality indicators for the care of people with diabetes related to the work process and report of adequate care according to the macro-regions of Brazil. External evaluation of the Access and Quality Improvement Program – 2012 and 2017/2018.

	Organization and management % (95%CI)		Clinical care % (95%CI)		Report of adequate care % (95%CI)	
	Cycle I	Cycle III	Cycle I	Cycle III	Cycle I	Cycle III
North	10.8 (7.6–14.7)	25.6 (22.7–28.6)	17.7 (13.7–22.4)	25.3 (22.5–28.4)	17.3 (13.4–22.0)	22.3 (19.6–25.3)
Northeast	11.3 (9.8–12.9)	34.8 (33.5–36.2)	27.1 (24.9–29.3)	36.2 (34.8–37.6)	21.0 (19.1–23.0)	31.6 (30.3–32.9)
Central-West	8.6 (6.6–11.1)	25.1 (22.8–27.5)	25.8 (22.4–29.3)	32.8 (30.3–35.4)	25.4 (22.1–29.0)	26.4 (24.1–28.8)
Southeast	14.9 (13.8–16.0)	26.6 (25.6–27.6)	41.8 (40.3–43.3)	31.5 (30.5–32.5)	30.0 (28.6–31.4)	30.9 (29.9–31.9)
South	8.6 (7.0–10.3)	20.3 (18.8–21.8)	27.7 (25.2–30.4)	22.7 (21.2–24.3)	22.8 (20.5–25.4)	26.9 (25.3–28.6)

95%CI: 95% confidence interval.

DISCUSSION

The findings indicated that, overall, there was an improvement in care for people with DM in PHC in Brazil and its regions among the teams participating in the PMAQ, from 2012 to 2018. The prevalence of access, availability of supplies/equipment, medicines, demand, organization, and management demonstrated an increase of at least 10 p.p. over the 6-year period.

Regarding access, the increase in the number of teams scheduling users' first appointments in less than 3 days may indicate improved organization to accommodate priority groups, such as people with diabetes. Notably, the proportions of users with appointments in the last 6 months at the UBS were high during both periods, surpassing those recorded by the latest PNS 12, which investigated the general population. However, it is essential for the teams to understand the reasons for non-use of services by individuals who attempted but were unable to access care, often due to sociodemographic factors,

preference for other services, geographic access barriers, and self-perception of need.[12,13] These aspects should be considered in population-based surveys, inquiring residents about their health needs, their search for and access to services within a given period, as well as specific characteristics of the health units, such as the size of the enrolled population and team composition.

Among the scheduling options in PHC, advanced access or same-day scheduling is a more user-centered model that necessitates a shift from traditional agendas focused on programmatic actions to those that prioritize spontaneous demand. In Brazil, its implementation has been promoted by managers and particularly by Family Practice Programs, aiming to expand access and enhance the work process of teams. Despite its advantages, Stelet et al.[14] emphasize that the success of this approach relies on adhering to fundamental premises and preparatory tasks outlined in the literature. However, without proper planning, implementing advanced access can compromise comprehensive health care, lead to professional suffering, reinforce the biomedical model, and result in social medicalization (characterized by care that is heavily focused on prescribing medications and requesting tests, especially highly complex ones).

In 2018, approximately a quarter of the UBS had all supplies and equipment available, which more than doubled compared to the 2012 assessment. However, the ophthalmoscope and monofilament kit were the least frequently used materials, likely contributing to the low frequency of the synthetic indicator in both cycles. Bakke et al.[15] found that only 27.5% of 281 general practitioners in 77 health units in Norway used monofilament to examine the feet, and 60% performed eye exams. Additionally, a study conducted in a city in Paraná (2013/2014) assessing the quality of care for people with type 2 DM within the scope of PHC highlighted the absence of essential components of the physical structure, supplies, materials, and equipment necessary for this care.[16]

Regarding diabetes medications, the results of Neves et al.,[16] who evaluated the structure of UBS for the care of people with diabetes in health services participating in Cycles I and II of the PMAQ (2012 and 2014), reaffirm the findings of the present study, indicating a consistent increase in the availability of medications necessary for qualified care over time. Metformin was one of the most widely available medications in both cycles, likely due to the higher prevalence of type II diabetes among users. Its recommendation has been maintained as a first-line option because of its beneficial effects in reducing blood sugar levels, low-density lipoproteins, and triglycerides, as well as its modest contributions to weight reduction and increases in high-density lipoproteins.[8,16]

It is important to note that the analysis of the frequencies observed may be influenced by the supply of medications through the Popular Pharmacy Program of Brazil (*Programa de Farmácia Popular do Brasil* – PFPB), implemented by the MoH in 2004. The PFPB provides continuous-use medications at commercial pharmacies free of charge to users, benefiting individuals with chronic diseases,[17] including DM. This may explain the low availability of these medications in the UBS. Data from the 2013 PNS indicate that more than half of diabetics (57.4%; 95%CI 54.2–60.2) obtained at least one medication from the PFPB, with variations noted between major Brazilian regions.[18] Furthermore, the analysis of only four groups of medications is due to the availability of data in the instrument, as the technical areas of the MoH likely limited this list to medications with greater frequency of use, omitting those indicated for more complex cases.

Considering the organization and management component, the aspects that stood out most positively were those related to the continuity of care. The coordination of the waiting list for consultations and exams at other points in the network and the maintenance of records for users with greater clinical vulnerability increased by approximately 30 p.p. during the period. Additionally, scheduling of consultations and exams

showed significant improvements based on risk stratification and the assurance of scheduling subsequent appointments. Several factors likely contributed to this change, including training initiatives, enhancements in electronic records, and team motivation fostered by the self-assessment processes recommended by the PMAQ. Furthermore, the Maringá study conducted in 2013 and 2014 also identified insufficiencies related to the work process regarding health education actions, capture of new cases, follow-up and monitoring, information management, provision of continuing education, and planning of team actions.[16]

Regarding the clinical care reported by the teams, the decline in the synthetic indicator — encompassing foot and fundus examinations — should be viewed with concern. Although there has been significant growth in the performance of periodic foot examinations, nearly 20% of the teams in 2018 did not report conducting them, which may impede the early identification of peripheral vasculopathies, one of the most common complications of DM, affecting quality of life and functional capacity.[19,20]

Periodic fundus examinations were reported less frequently by teams in 2018 than in 2012, reflecting a 12 p.p. decrease. The eyes are among the organs most frequently affected by DM, and conducting funduscopy periodically can facilitate the timely detection of early lesions and appropriate treatment.[19,21] Although official documents and protocols indicate that these examinations should be performed in primary healthcare settings, most primary healthcare units suffer from structural deficiencies that hinder ophthalmoscopy — lack of appropriate lighting, eye drops for pupil dilation, and an ophthalmoscope. Additionally, the need for training professionals in this type of assessment is crucial. Fundus examinations were reported 50% more frequently in 2012 and 112% more frequently in 2018 by teams that had access to an ophthalmoscope.

Despite recommendations for retinopathy screening to be conducted by specialists using more precise equipment, the MoH protocol guiding DM actions in primary care includes the fundus examination as part of the periodic physical examination.[8] It is important to note that the PMAQ data collection instrument was based on these official protocols, which supports the current analyses. Many health professionals interviewed may refer users with DM for screening at other levels of the health system, including teleophthalmology; however, this information was not collected in the study.

The care perceived by users as adequate showed a slight increase of 3.5 p.p. Contributing most to this result was the report of having their feet examined in the last 6 months, which increased by 5.1 p.p. In both cycles, the indicator reported by users was approximately half the proportion reported by the teams. This discrepancy raises several questions: “Does the professional perform the examination without the user noticing?”; “Does the user forget that their feet were examined?”; “Does the professional fail to inform the user about the examination?”; “Or does the professional not perform it due to time constraints during the consultation?”; “Did the team respond based on protocols?” Since the research instrument did not specify details of the foot examination, such as palpation and use of monofilaments, users may not have been aware of the examination’s performance. Another possibility is that professionals only conduct the examination when they have the necessary resources for a comprehensive assessment.

A concerning finding was that only about half of users reported having received guidance on foot care, with no significant increase between 2012 and 2018. Studies indicate that educational measures, along with regular examination and risk classification of feet, can help reduce the occurrence of injuries by up to 50%.[22-24] Guidance on proper foot care, which can be provided by professionals during consultations, incurs no cost for the service; however, it requires more time, which can be challenging in situations of high demand in UBS and frequent turnover of professionals within teams.

In the regional analysis of the country, all indicators, except for the provision of clinical care, showed an increase in prevalence, particularly in the Northeast region. This is a positive development, as this region had the lowest prevalence in most indicators in 2012. One hypothesis is that the financial incentive of the PMAQ may have motivated teams and service managers in municipalities with greater vulnerability to exert greater efforts to improve their indicators.

Among the limitations, a potential overestimation of responses regarding the work process is noteworthy, as the interviewee was a member of the team and the assessment was planned. Another limitation is that the indicators were created based on the availability of variables in the databases, which were similar in the two assessment points, making it impossible to compare them with other studies due to the lack of a standardized instrument. The users interviewed were linked to the assessed teams, which could lead to inflated responses regarding care. However, unlike the teams, the users were unaware of the study and were interviewed prior to their appointments. Regarding the study's strengths, its national scope is significant; in 2018, most teams participated in the program, providing reliable data on the primary care network for DM care in the country. Additionally, the comparison between two time periods evaluating a range of indicators is scarce in the literature, indicating that the study addresses this gap and offers hypotheses for advancing research on the subject.

Despite the evident improvement in care for people with DM during the period, it was found that, in 2018, at most five out of ten teams met the six synthetic indicators evaluated, indicating a deficit in the quality of care provided to this population. It is important to highlight that the costs associated with chronic degenerative diseases are high, particularly when they lead to hospitalizations. According to Nilson et al.,[25] in 2018, hospitalizations for high blood pressure, diabetes, and obesity in the Brazilian Unified Health System (*Sistema Único de Saúde* – SUS) accounted for 1,829,779 cases (16% of total hospitalizations), resulting in a cost of R$3.84 billion. Given the increasing prevalence of DM in the country,[9] greater investment is needed in the infrastructure of services and in continuing education programs for health professionals, leading to policies that enhance access and improve DM care within the PHC network.

CONFLICT OF INTERESTS

Nothing to declare.

AUTHORS' CONTRIBUTIONS

ET: Conceptualization, Data Curation, Formal Analysis, Methodology, Supervision, Validation, Writing – Original Draft, Writing – Review & Editing. DSS: Conceptualization, Data Curation, Formal Analysis, Methodology, Supervision, Validation, Writing – Original Draft, Writing – Review & Editing. RGN: Conceptualization, Data Curation, Formal Analysis, Methodology, Supervision, Validation, Writing – Original Draft, Writing – Review & Editing. ET: Conceptualization, Data Curation, Formal Analysis, Methodology, Supervision, Validation, Writing – Original Draft, Writing – Review & Editing. MADCC: Supervision, Validation, Writing – Original Draft, Writing – Review & Editing. NBRB: Writing – Review & Editing. LAF: Conceptualization, Data Curation, Formal Analysis, Methodology, Supervision, Validation, Writing – Original Draft, Writing – Review & Editing.

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