

Effect on diabetes standard of care 2 years after COVID pandemic

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Abstract

Background: Diabetes mellitus (DM) is a chronic metabolic disorder requiring long-term management to prevent complications. The COVID-19 pandemic has impacted healthcare systems globally, necessitating adaptations in care delivery. This study explores the impact of the pandemic on DM care standards from 2019 to 2022 by examining process and outcome indicators.

Methods: A retrospective cohort study was conducted using a quantitative approach, analyzing 12 indicators of DM care standards among 9,423 adult patients diagnosed with type 1 or 2 diabetes mellitus attending an outpatient medical clinic.

Results: The results indicated consistently high scores for creatinine/eGFR tests and low scores for referrals to clinic nutritionists. The lipid profile check-up indicator displayed a declining trend in measurements. Most indicators showed increased positive scores in DM care standards after the COVID pandemic (2022), with the exception of the lipid profile check-up.

Discussion: The findings suggest that while some aspects of DM care have improved, other areas, such as nutritional counseling and lipid profile check-ups, require further attention. Addressing these gaps is crucial for ensuring comprehensive and effective DM management, which involves raising awareness among healthcare providers and providing necessary resources and support.

Keywords: Diabetes Mellitus; COVID-19; Healthcare; Standards of care; Chronic disease management

betes care.² However, the COVID-19 pandemic brought about significant changes in healthcare systems, including the implementation of telemedicine, a decrease in in-person visits, and the reallocation of healthcare resources toward COVID-19.³

This study seeks to explore the impact of the COVID-19 pandemic on DM care standards two years after its onset by examining process and outcome indicators from 2019 to 2022. The research will utilize data from DM patients referred to clinics for DM management. The data encompass 12 indicators of DM care standards, with the analysis concentrating on the average percentage of each indicator and any disparities between the years before, during, and after the pandemic.

Materials and Methods

The investigation of the COVID-19 pandemic's effects on diabetes mellitus patients' care standards was a retrospective cohort study conducted using a quantitative approach. 12 indicators were included: Dental referral, ophthalmology referral, clinic nutritionist referral, urine albumin checked, lipid profile checked, creatinine/eGFR checked, HbA1c testing quarterly, HbA1c testing quarterly checked for patients who attended the clinic quarterly, urine albumin below target, HbA1c below target, LDL below target, and creatinine/eGFR below target. The sample comprised 9,423 adult patients diagnosed with type 1 or 2 diabetes mellitus who attended the outpatient medical clinic from 2019 to 2022.

Results

Data was obtained from electronic medical records through an integrated information system and then analyzed using descriptive statistics in tables and graphs to compare the results before, during, and after the COVID-19 pandemic. Ethical approval was secured from the bioethics committee for scientific and medical research at the University of Jeddah (Table 1).

Table 1: Analysis and Results.

| INDICATORS | 2019 (%) | Average 2022 (%) | Differences (%) |
|----------------------------------|----------|------------------|-----------------|
| Dental Referral for Diabetes (%) | 9 | 11 | 2 |
| Urine Albumin checked (%) | 50 | 55.67 | 5.67 |
| Urine Albumin below target (%) | 36 | 42.67 | 6.67 |
| HbA1c below target (%) | 13 | 25 | 12 |

Introduction

Diabetes Mellitus (DM) is a chronic metabolic disorder that affects millions of people globally. It necessitates long-term management to avert complications such as heart disease, kidney disease, and blindness.¹ In various settings, a combination of performance measures has been linked to lasting improvements in certain aspects of dia-

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Received: 06-May-2023, Manuscript No. AJDM-23-97923;

Editor assigned: 08-May-2023, PreQC No. AJDM-23-97923

(PQ); Reviewed: 11-May-2023, QC No. AJDM-23-97923;

Revised: 11-May-2023, Manuscript No. AJDM-23-97923 (R);

Published: 15-May-2023, DOI: 10.54931/AJDM-31.3.1.

| | | | |
|--|----|-------|-------|
| Lipid profile checked (%) | 41 | 33.33 | -7.67 |
| LDL below 100 mg/dl (%) | 59 | 60 | 1 |
| Ophthalmology (%) | 15 | 25.67 | 10.67 |
| HbA1c testing frequency atleast 4 times (%) | 5 | 12.33 | 7.33 |
| HbA1c testing frequency with 4 visit to the clinic (%) | 24 | 35 | 11 |
| Clinic nutritionist referral (%) | 3 | 7.67 | 4.67 |
| Creatinine eGFR checked (%) | 80 | 86.67 | 6.67 |
| Creatinine below target (%) | 21 | 33.67 | 12.67 |

In the year prior to the pandemic (2019), the creatinine/eGFR test had the highest percentage (80%), followed closely by DM patients with their LDL below the target (59%) (Figure 1). The lowest standards of care were observed among DM patients referred to the clinic nutritionist (3%) and those receiving HbA1c testing quarterly (5%). Similar patterns were observed during the years of the COVID pandemic (2020 and 2021) (Figures 2 and 3), with the highest standards of care measurements from creatinine/eGFR tests (82%) and DM patients with their LDL

below 100 mg/dl (51% in 2020 and 53% in 2021). Lower scores were also noted in referrals to the clinic nutritionist (4%) and HbA1c testing quarterly (6%). These patterns were also present before the COVID pandemic, showing improvements in indicator measurements, except for HbA1c below target (13% in 2019, 19% in 2020, and a slight decrease to 15% in 2021). Additionally, there was no improvement in the lipid profile indicator before and during COVID, as it displayed a negative trend in measurements (41% in 2019, 34% in 2020, and 29% in 2021). In 2022, the quarterly indicator measurements revealed similar trends (Figure 4), with the highest scores for creatinine/eGFR checked (86.67%) and LDL below 100 mg/dl. The lowest scores were observed in referrals to the clinic nutritionist (7.667%) and dental (11%). When compared to the years before COVID, there was an improvement in DM standards of care measurements, with the highest improvement seen in the HbA1c below target indicator, showing a 12% difference. The indicator with the least improvement was the lipid profile checkup, which demonstrated a declining trend from 2019 to 2022.

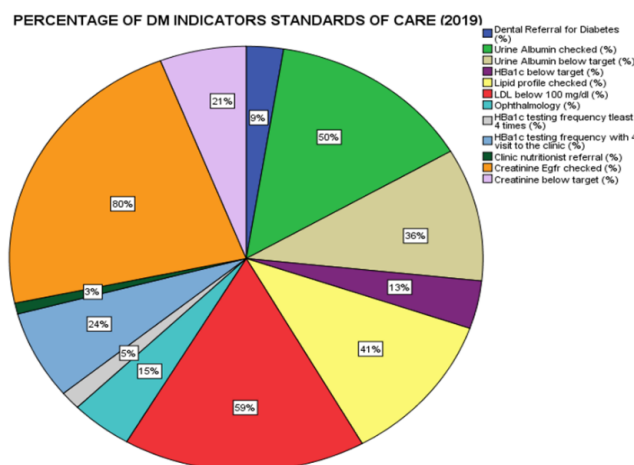


Figure 1: Percentage of indicators stander of care (2019).

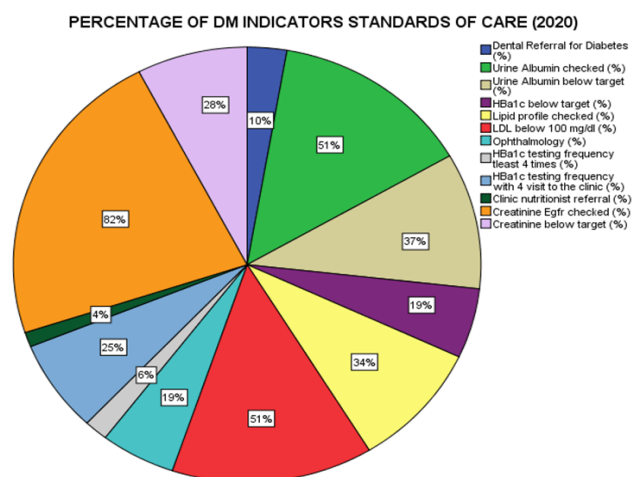


Figure 2: Percentage of indicators stander of care (2020).

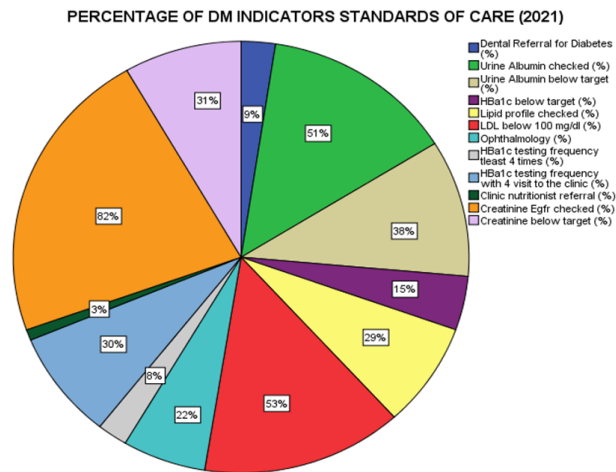


Figure 3: Percentage of indicators stander of care (2021).

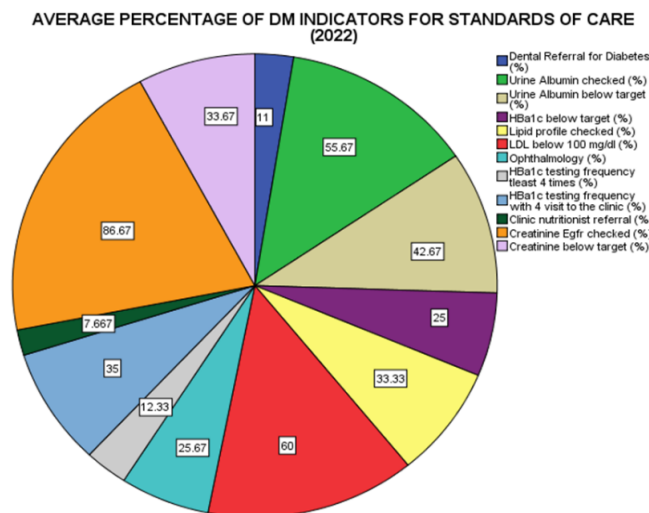


Figure 4: Percentage of indicators stander of care (2022).

The observed trends in DM standards of care indicators showed that the creatinine/eGFR check-up indicator consistently had the highest scores from 2019 to 2022, while the lowest scores were recorded for referrals to the clinic nutritionist. The only indicator that showed a decrease in scores after COVID (2022) was the lipid profile check-up, which exhibited a declining trend in measurements over the years. In contrast, all other indicators displayed increased positive scores in the standard of care among DM patients after COVID (2022).

Discussion

The analysis of the results reveals several interesting trends regarding the standard of care among DM patients. The consistently high scores for creatinine/eGFR tests across the years indicate that this aspect of DM care has remained a priority and is being adequately addressed. However, the consistently low scores for referrals to the clinic nutritionist and the declining trend in lipid profile

checkups suggest that there are still areas within DM care that need further improvement and attention.

It is worth noting that the COVID pandemic had an impact on various aspects of DM care,⁴ as seen through the fluctuations in the indicator measurements. Despite the challenges posed by the pandemic, the standard of care among DM patients generally improved in several aspects, as evident by the increased positive scores in most of the indicators after 2022. This improvement could be attributed to the increased awareness and importance placed on managing chronic conditions like diabetes during the pandemic.

The improvement in the HbA1c below target indicator is particularly significant, as it demonstrates better glycemic control among DM patients. This is an essential aspect of diabetes management, as good glycemic control can significantly reduce the risk of diabetes-related complications.

The consistently low scores in referrals to the clinic nutritionist highlight the need for better integration of nutritional counseling and support in DM care. Nutrition plays a critical role in diabetes management, and these results suggest that this aspect of care may not be receiving the attention it deserves. Addressing this gap could lead to better overall outcomes for DM patients, as proper nutrition guidance can help patients make healthier choices and manage their condition more effectively.

The declining trend in lipid profile checkups is another area of concern, as regular monitoring of lipid levels is essential for DM patients to manage their cardiovascular risk. The decrease in scores may indicate that there is a need for better awareness among healthcare providers and patients about the importance of regular lipid monitoring in diabetes care.

Interestingly, the results show improvements in most of the indicators after the COVID pandemic, despite the challenges it brought to healthcare systems globally. This may indicate that healthcare providers and patients adapted to the new circumstances, and, in some cases, even enhanced their focus on managing DM. However, further research is needed to explore the specific factors that contributed to these improvements.

The study's limitations include its retrospective nature, which depends on pre-existing data and may lead to biases or discrepancies in the results. Additionally, the research is based on data from a single outpatient medical clinic, which restricts the applicability of the findings to other contexts. The quantitative methodology employed in the study might not capture the subtleties of patient experiences or healthcare provider perspectives, as it does not include qualitative data. Moreover, potential confounding variables such as changes in healthcare policies, resource availability, and patient adherence to treatment guidelines were not taken into account, which could have impacted the observed trends. Although the study provides valuable insights into the effects of the COVID-19 pandemic on DM care standards, these limitations should be considered when interpreting the results. Future research addressing these limitations may contribute to a more thorough understanding of the pandemic's impact on DM care,⁵ and

inform strategies for enhancing patient outcomes.

Conclusion

This study provides valuable insights into the impact of the COVID-19 pandemic on diabetes mellitus care standards from 2019 to 2022. The results indicate that, despite the challenges posed by the pandemic, several aspects of DM care have improved, such as glycemic control. However, areas such as nutritional counseling and lipid profile check-ups still require attention and improvement to ensure comprehensive and effective diabetes management. The study highlights the need for ongoing vigilance in addressing gaps in DM care and raising awareness among healthcare providers and patients about the importance of a holistic approach to managing this chronic condition. Moreover, it emphasizes the importance of providing necessary resources and support to maintain and improve DM care standards, even in the face of global health crises. Future research should focus on addressing the limitations of this study and exploring the specific factors contributing to improvements in DM care standards after the COVID-19 pandemic, ultimately guiding strategies to optimize patient outcomes in the long term.

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