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Case Report

# What is the effectiveness of post-discharge pharmacotherapeutic empowerment of patients with diabetes?

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ABSTRACT

The objective of the present article was to evaluate the glycemic control of patients with diabetes mellitus (DM) after discharge from a pharmacotherapeutic empowerment program. The results suggest that the strategy is effective for short-term glycemic control, but the benefits are not maintained after discharge, indicating the need for the pharmacist's continuous role.



## 1. Introduction

Diabetes mellitus (DM) is a public health problem, the prevalence of which is increasing worldwide [1,2]. In an attempt to help patients achieve therapeutic goals, several strategies have been adopted by health teams. Among these strategies, empowerment has played an important role in the management of DM type 2 (DM2), with several studies demonstrating its effectiveness in promoting self-care [3–5].

Empowerment occurs as part of an educational process in which patients acquire knowledge and improve their responsibilities and autonomy to gain the power to make decisions related to their health condition, sharing responsibilities with health professionals [6,7]. In this context, pharmacists can offer education and counseling on DM self-management as part of an action developed by a multi-disciplinary team.

Studies have demonstrated that strategies based on pharmacotherapeutic empowerment have shown beneficial results in patients' glycemic control [8,9]. However, there is a lack of studies that evaluate the effects of these strategies in the long term and after discharge by the pharmacist. Therefore, the objective of the present article is to evaluate the glycemic control of patients with DM2 following discharge from a pharmacotherapeutic empowerment program.

## 2. Methods

The present investigation is part of a previous study conducted in the city of Divinópolis, in the interior of Brazil, aimed at promoting the pharmacotherapeutic empowerment of patients with DM2 [10]. The intervention was performed with three individual meetings between the pharmacist and patient. Laboratory tests were performed using glycated hemoglobin (A1c) to evaluate the effectiveness of the intervention, both before the intervention (T0) and 120 days after its end (T1). Patient follow-up occurred between April 2015 and February 2016, and 62 patients participated in the study, of whom 47 completed the intervention. The methodology of the study is described in Aquino et al., 2019 [10]. The study was approved by the Human Research Ethics Committee of the Federal University of São João Del-Rei (CAAE 32787914.0.0000.5545).

The present study evaluated the patients' laboratory tests one and a half years after the end of the follow-up with the pharmacist (T2). For this, laboratory tests were performed during routine follow-up with a physician in the Brazilian Unified Health System (*Sistema Único de Saúde* - SUS). Laboratory tests were extracted from the Integrated Health System (IHS) secondary database. To evaluate the effectiveness of the post-discharge empowerment program, the A1c test was chosen as the evaluation parameter, and data collection was performed through the IHS in September 2017, considering the most recent test available at the time.

Fig. 1 describes the steps of the study. For the post-discharge evaluation (T2), 47 patients who completed the intervention at T1 were included. Patients who did not have a routine check-up performed through the IHS between T1 and T2 were excluded.

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| $T_0$ | $T_1$ | $T_2$ |
|---|---|---|
| **Before Intervention** | **After Intervention (Discharge)** | **Post-discharge** |
| - Initial evaluation | - Final evaluation | - Routine laboratory test |
| - Laboratory tests | - Laboratory tests | |

**Fig. 1.** Stages of the study.

The STATA program - Data Analysis and Statistical Software® version 12.0 was used in analyses, and the Wilcoxon test was applied for comparison analyses, considering the non-normal data distribution.

## 3. Results

Of the 47 patients who completed the intervention, 38 (80.9%) were included for post-discharge evaluation, with the prevalence of women (76.3%) and an age group from 40 to 60 years (60.50%). Fig. 2 shows the variation of A1c (n = 38) of the three times (T0, T1, and T2). It is observed that between T0 and T1 there was a significant reduction of A1c (p = 0.021) from a median of 7.0% (Interquartile range - IQ 6.4–8.0%) to 6.6% (IQ 6.1–7.5%), demonstrating the effectiveness of the intervention [10]. However, this result did not persist after discharge, with an A1c elevation in T2 to 6.9% (IQ 6.0–8.8%). The increase in A1c between T1 and T2 presented a significant difference (p = 0.034), indicating that the improvement in glycemic control was lost in the post-discharge period.

The results showed that there was a favorable impact on the glycemic control of patients with DM2 after six months of pharmacotherapeutic intervention. However, the results were lost in the long run without follow-up with the pharmacist.

Some hypotheses may be raised to explain the loss of effectiveness in post-discharge. The first is that empowerment is a process that allows patients to take control of their health, considering their life history and the prescribed recommendations [11]. As these vary according to the progression of DM2, new skills must be developed with patients according to the needs that arise. DM requires continuous clinical care and ongoing education for self-care [2]. Therefore, the time of the empowerment strategy used by the authors may not have been sufficient to promote the self-management of DM in a lasting way, suggesting the need for a process with continuous and periodic follow-up by the DM health educator.

Another hypothesis is that pharmacists become an indispensable part of a multi-disciplinary team to help reduce medication-related problems, as a consequence of the comorbidities and the increasing complexity of drug therapy that emerge as DM2 progresses [12]. Several studies have shown that clinical services carried out by pharmacists improve safety in the use of medicines in hospitals and the community, promoting quality of life and cost reduction [13,14]. Thus, pharmacists can offer self-management education and counseling on DM as part of the action of a multidisciplinary team in the ongoing care of patients with DM [15]. In addition, these professionals contribute to improving adherence to pharmacotherapy through the counseling of patients on the objectives and need for prescribed medication [14].

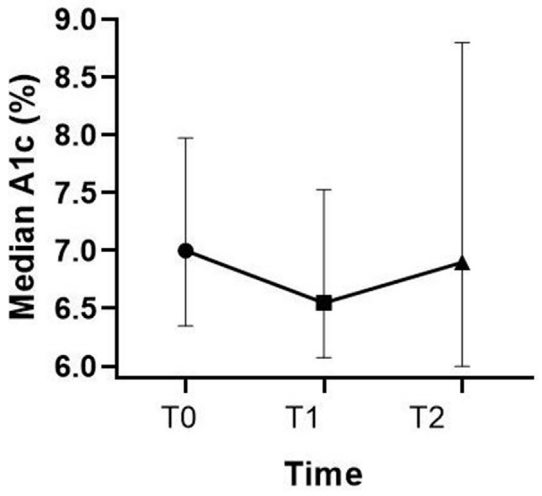


**Fig. 2.** A1c variation in patients with type 2 diabetes mellitus before and after intervention, and after discharge from a program for pharmacotherapeutic empowerment, Brazil, 2015–2017.

## 4. Conclusion

It is concluded that pharmacotherapeutic empowerment is effective in the short-term glycemic control of DM2, but the benefits do not last after discharge. In view of this result, it is suggested that pharmacists' follow-up should be continuous to avoid recurring complications that may arise.

## Conflicts of interest

None.

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