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Pilot Study of a Therapeutic Patient Education Program for Diabetic Patients in a Community Pharmacy in Rabat, Morocco

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Abstract | **Original Research Article**

Introduction: Therapeutic Patient Education (TPE) is a structured and continuous approach, recognized and defined by several health organizations, notably the World Health Organization (WHO). It aims to improve the quality of life of patients with chronic diseases and requires the active involvement of the pharmacist, particularly in community pharmacies. ***Objective:*** The objective of our study is to evaluate an educational program in community pharmacies for patients with diabetes, with the aim of improving their knowledge, adherence, and disease management, while raising their awareness of the importance of follow-up care and the risks associated with the disease. ***Materials and Methods:*** The study was conducted among diabetic patients visiting Pharmacy X in the city of Rabat to obtain or renew their medication. Twenty patients who consented to participate underwent two confidential interviews. The first, lasting 10 to 15 minutes, allowed for the collection of necessary data, the establishment of an educational diagnosis, and the scheduling of a second appointment. The second interview, lasting 20 to 45 minutes, focused on treatment and disease management, using educational handouts, and concluded with an evaluation questionnaire. All data were collected over a one-month period and then analyzed using Excel software. ***Results:*** Our study revealed a significant improvement in patients' knowledge, with 80% of them gaining a better understanding of a balanced diet and 70% of the importance of physical activity. The educational approach also helped 47% of participants better recognize the warning signs of hypoglycemia and hyperglycemia, as well as the steps to take in the event of blood sugar imbalances. ***Conclusion:*** In Morocco, therapeutic education remains limited despite its importance in chronic diseases. Pharmacists can play a key role by adopting an educational approach and using appropriate tools. The study conducted in a community pharmacy with diabetic patients confirms its positive impact. Nevertheless, a broader multidisciplinary approach remains necessary to confirm these results.

Keywords: Therapeutic education, community pharmacy, diabetes, educational approach.

INTRODUCTION

Recognized by several international health organizations, notably the WHO, TPE is a formalized and continuous, patient-centered approach. Its primary objective is to improve the quality of life of people with chronic diseases by enabling them to better understand their condition, adopt health-promoting behaviors, and effectively manage their treatment.

Implementing this approach requires the active and regular involvement of the pharmacist, particularly in community pharmacies, who plays a key role in supporting patients, monitoring treatment, tailoring advice to each individual's situation, and promoting medication adherence.

Furthermore, TPE is based on a continuous and multidimensional educational process, combining information, awareness-raising, motivation, and skill development, in order to empower patients to take responsibility for their daily health management.

MATERIALS AND METHODS

Objectives of the Study

To evaluate the feasibility and acceptability of an educational approach in community pharmacies for

patients with chronic diseases, particularly diabetic patients, by examining the relevance of the educational tools used (assessment questionnaires, educational handouts, etc.) as well as the conditions for implementation, including the privacy of the setting and the duration of pharmaceutical consultations.

Study Procedure

This is an educational initiative conducted in community pharmacies, based on a transmissive learning model, among patients with insulin-dependent diabetes (T1D) and non-insulin-dependent diabetes (T2D).

Diabetic patients who came to the pharmacy to obtain or renew a prescription and who consented to participate were included. The first consultation (10–15 min) was used to collect data and establish an educational diagnosis. The second consultation (20–45 min), conducted individually by appointment, addressed treatment and disease management using educational handouts.

Finally, the patient completes a questionnaire assessing the knowledge gained during this consultation and their level of satisfaction with this pharmaceutical intervention. Figure 1 illustrates the various stages of the educational process carried out for patients in community pharmacies.

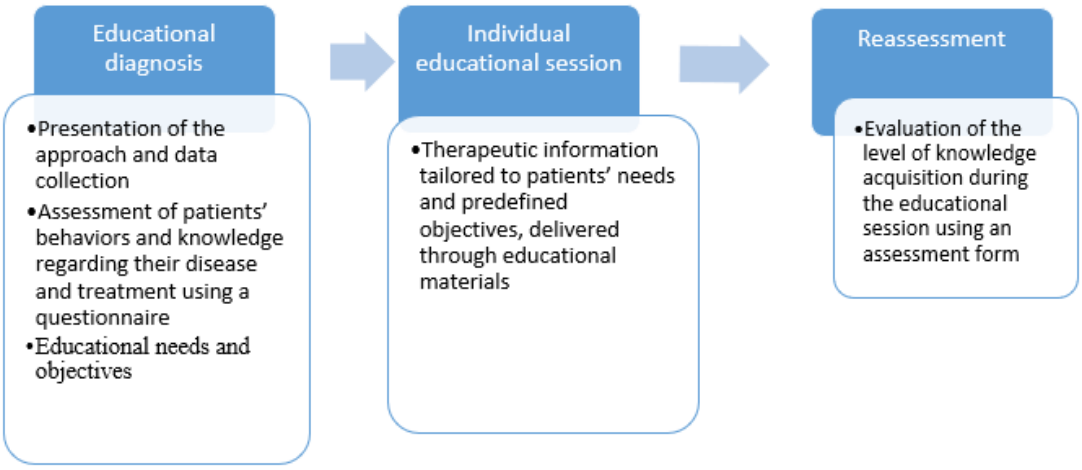

Figure 1: Educational process

Statistical Analysis

To assess the patients' level of knowledge before and after the educational process, each selected answer was assigned a score based on the patient's level of knowledge:

- Acquired (A): 20/20
- Partially acquired (PA): 10/20
- Not acquired (NA): 0/20

Patients' responses before and after the educational session were entered into a Microsoft Excel database. Responses were sorted using a "pivot table" and expressed as the number and percentage of respondents.

RESULTS

Characteristics of the study population

The distribution of the study population by age group is presented in Figure 2.

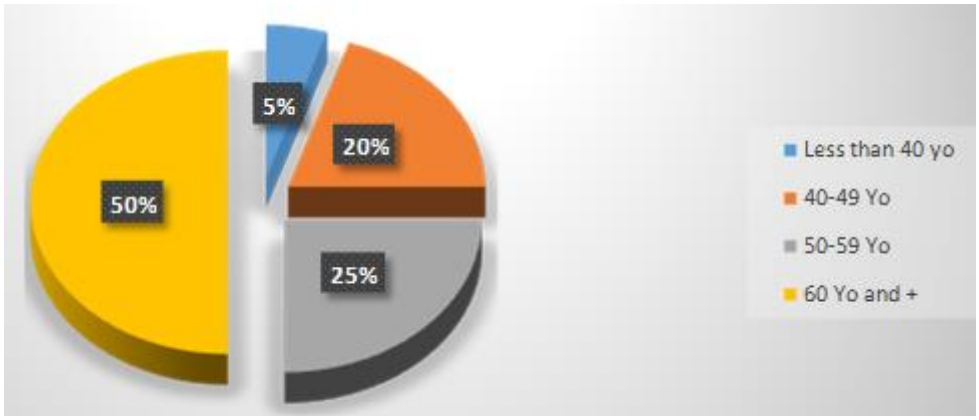

Figure 2: Distribution of the study population by age group

Our study population consists of 15 women and 5 men (Figure 3).

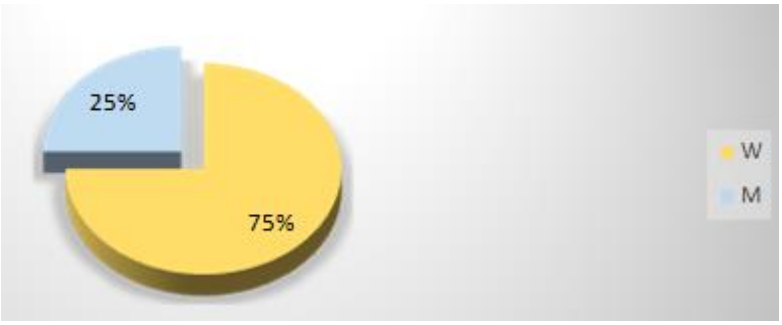

Figure 3: Distribution of the study population by gender

The distribution of the population by type of diabetes is shown in Figure 4.

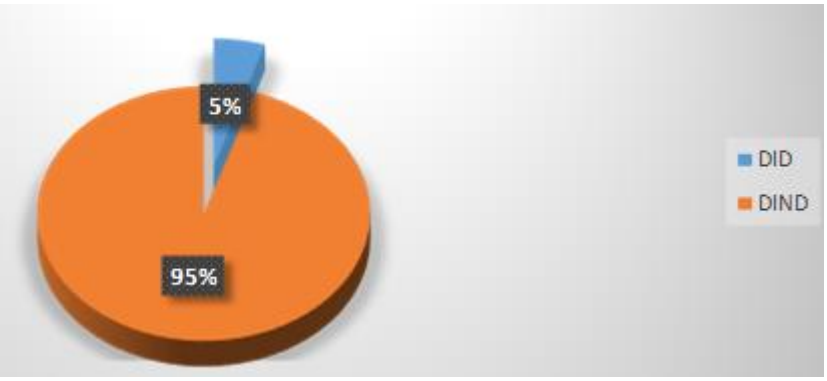

Figure 4: Distribution of patients by type of diabetes

Disease monitoring and knowledge of treatment (Figures 5 and 6)

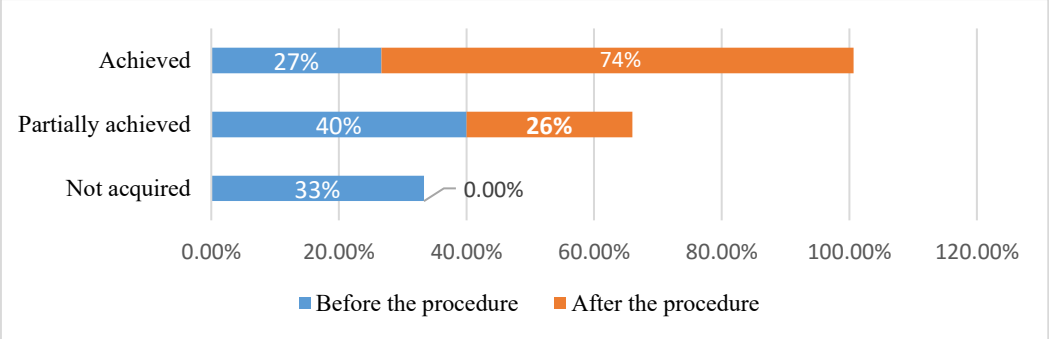

Figure 5: Knowledge of disease monitoring methods of the disease before and after the educational session

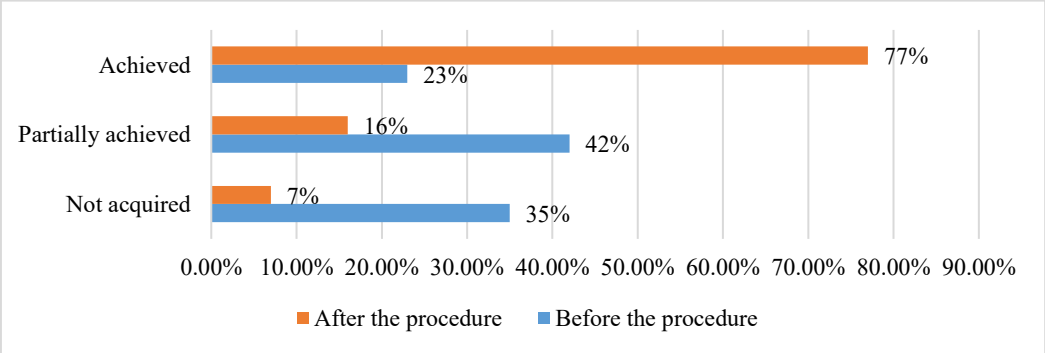

Figure 6: Knowledge of medication and dosing schedule before and after the educational session

Diabetes and Lifestyle: Diet and Physical Activity

Figures 7 and 8 illustrate the results obtained.

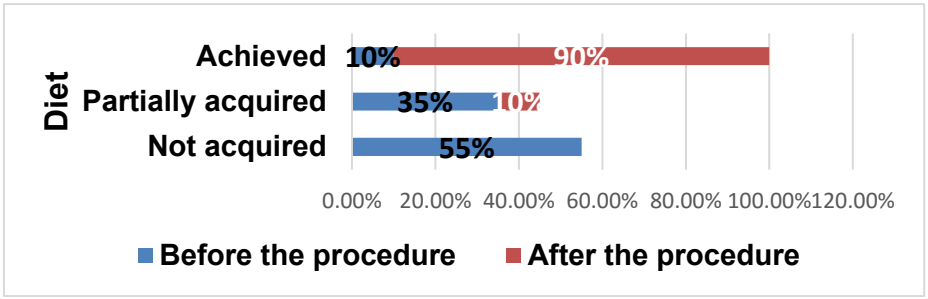

Figure 7: Knowledge of diabetic patients regarding the diet to follow before and after the educational session

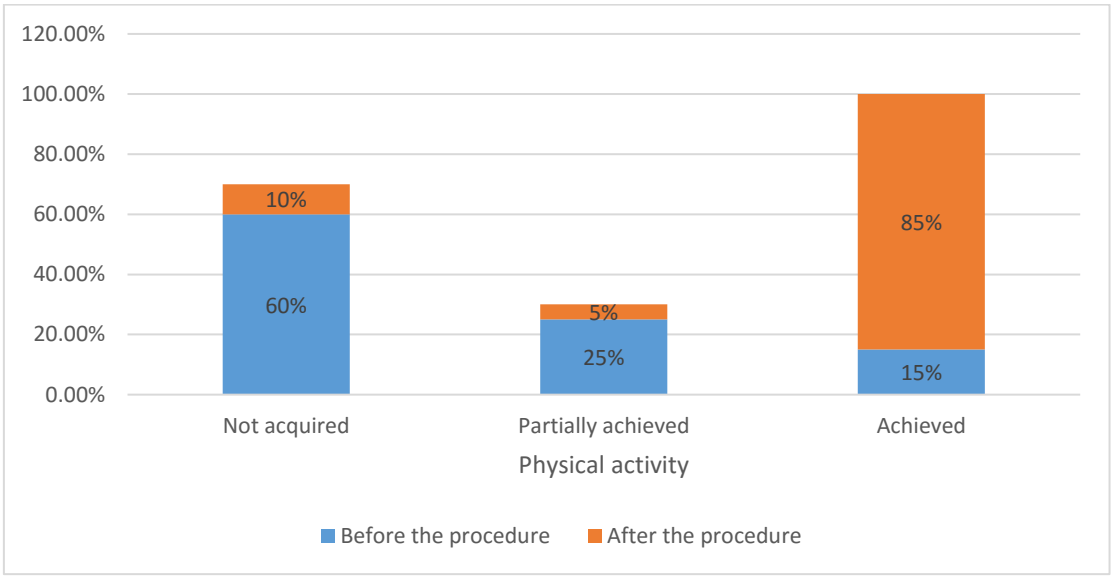

Figure 8: Knowledge of diabetic patients regarding of physical activity before and after the educational session

Warning signs of hypoglycemia and hyperglycemia

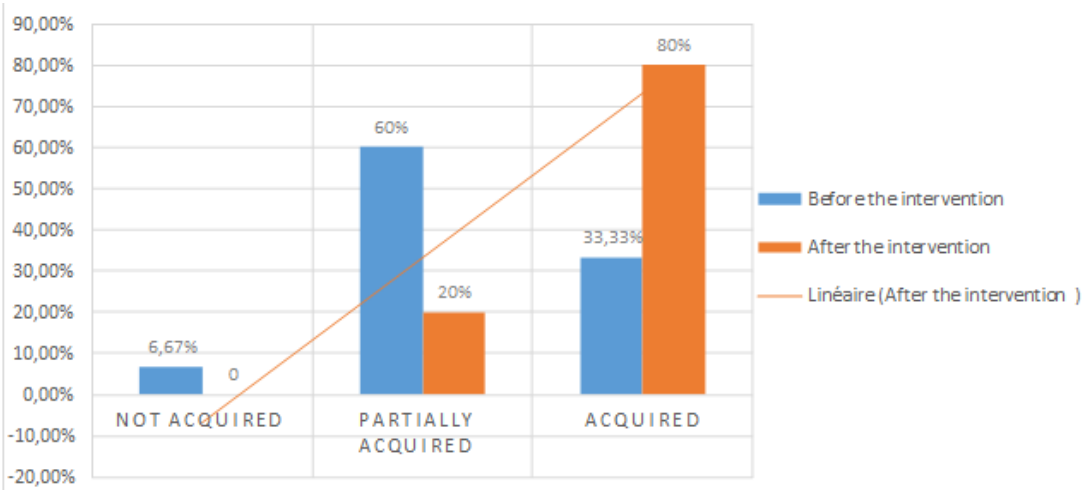

Figure 9: Patients' knowledge of the warning signs of hypoglycemia or hyperglycemia

before and after the educational session.

Challenges faced in the daily management of diabetes

The main challenges of diabetes management are presented in Figure 10.

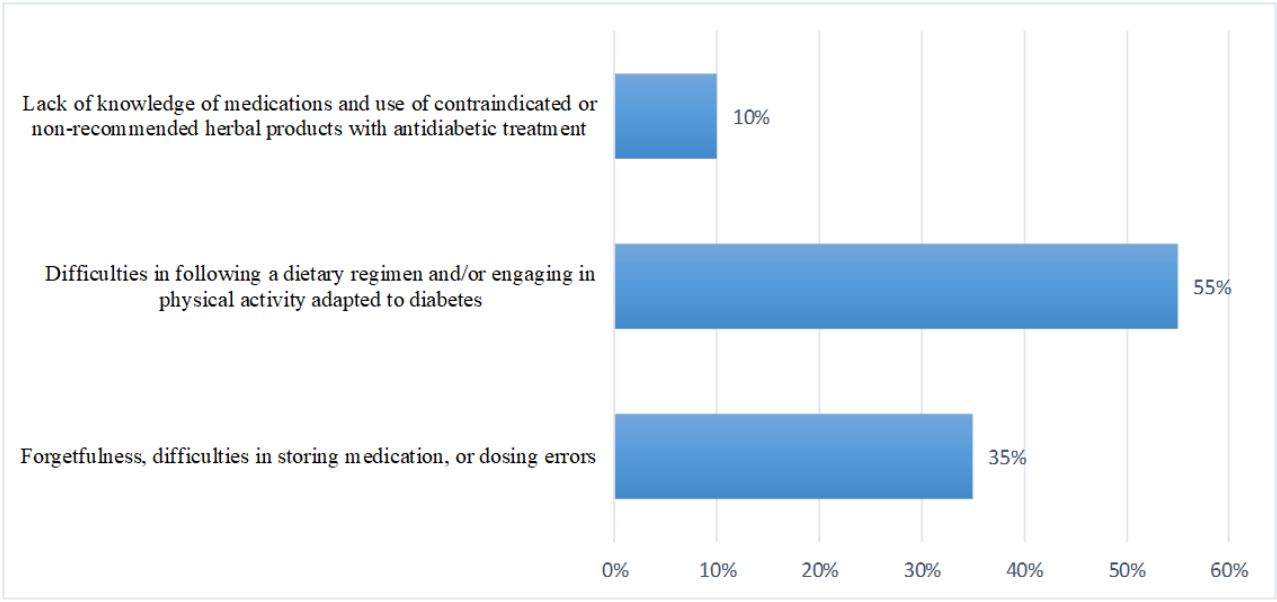

Figure 10: Challenges faced by diabetic patients managing diabetes.

Figures 11 and 12 illustrate the impact of educational level and duration of diabetes on the degree of treatment adherence.

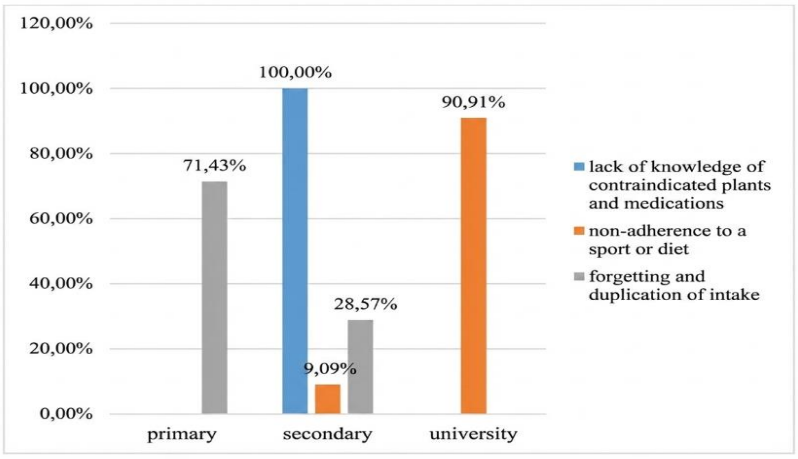

Figure 11: Challenges in diabetes management by patients' educational level

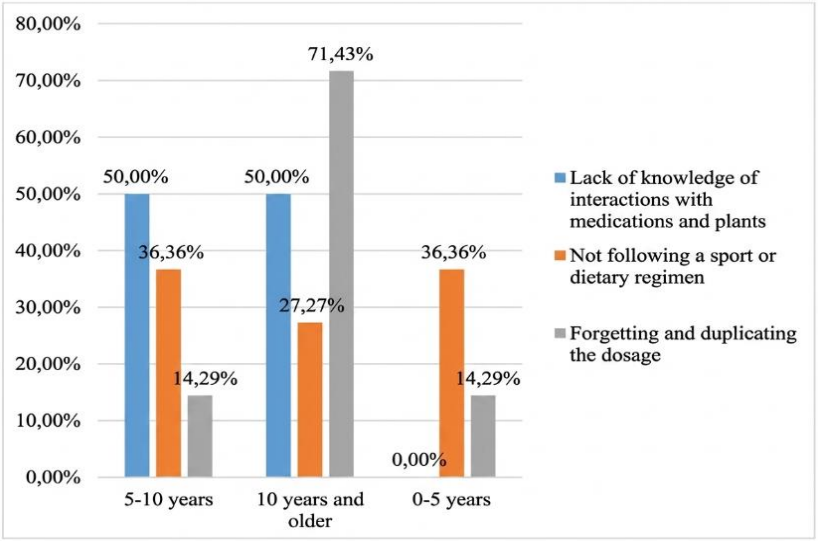

Figure 12: Challenges in diabetes management according to duration of diabetes

Sources of medical information among the study population

85% of patients in our study population stated that healthcare professionals (primary care physician, pharmacist, etc.) are the source of the treatment information they have acquired. The results are presented in Figure 13.

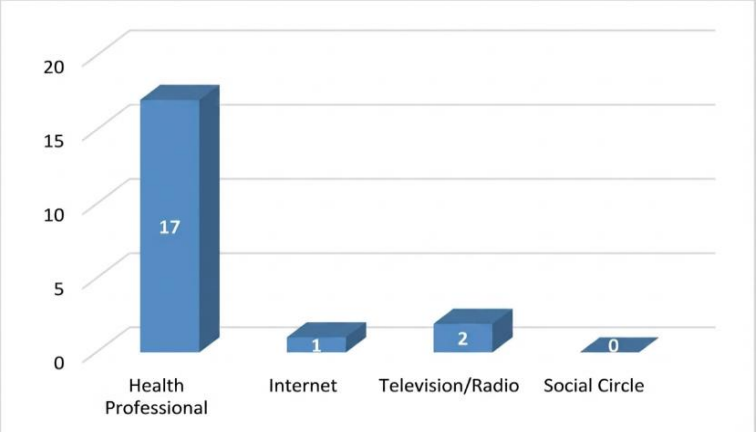

Figure 13: Sources of therapeutic information among patients

Assessment of the quality of pharmaceutical services and the patient-pharmacist relationship

12 patients in our sample (60%) are satisfied with the advice provided by their pharmacist. The results are presented in Figure 14.

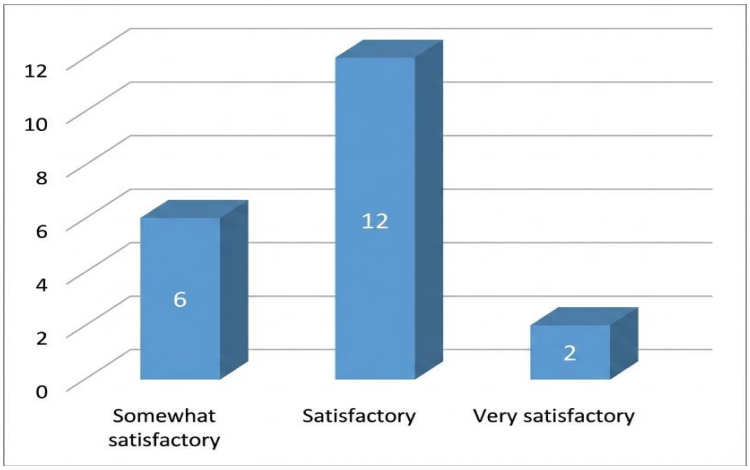

Figure 14: Assessment of the quality of pharmaceutical advice

The patient-pharmacist relationship is rated as good by 14 patients in our sample (70%). The results are illustrated in Figure 15.

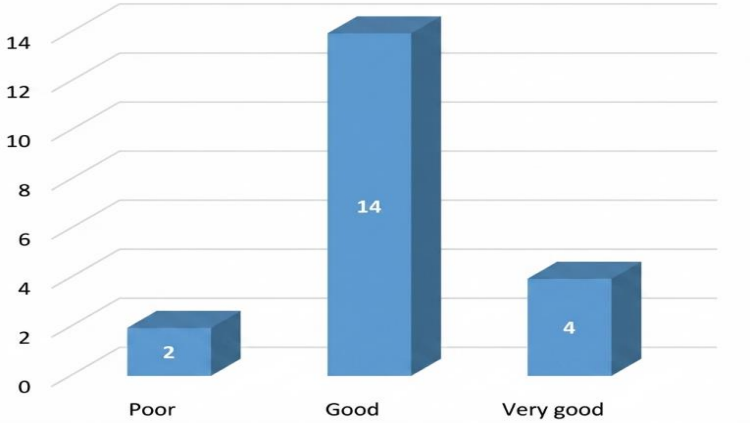

Figure 15: Assessment of the patient-pharmacist relationship according to the study population

Patient satisfaction scale regarding the educational approach

Figure 16 shows the patient satisfaction scale before and after the educational interviews.

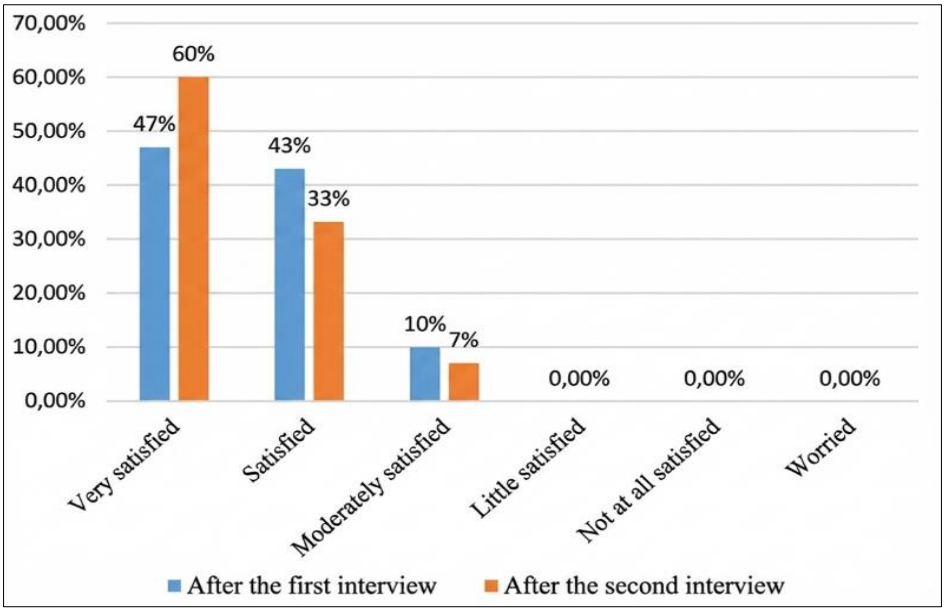

Figure 16: Satisfaction scores of diabetic patients after the two educational sessions

DISCUSSION

Description of the Study Population

The study population is distributed across various age groups, with a predominance of participants over the age of 60 (50%). The average age of the sample is 55.85 years.

The vast majority of the study population (95%) has type 2 diabetes (T2D), which explains the predominance of participants over the age of 40, as T2D occurs more frequently in people over 40 [1].

A predominance of female participants is also observed in our study, a finding similar to that reported in several studies involving patients with type 1 and type 2 diabetes [2,3].

Disease monitoring and knowledge about treatment

Figure 5 indicates that 33% of diabetic patients lacked knowledge of diabetes monitoring procedures (self-monitoring of blood glucose, frequency of checks, optimal interval between measurements), while 40% have partial knowledge and apply them imperfectly. This lack of knowledge and poor self-monitoring practices could be explained by inadequate medical follow-up, often linked to precarious living conditions, a lack of patient interest, or misconceptions about the disease.

Furthermore, *Aziouz* and a1 demonstrated that while 63% of patients with type 1 diabetes possess a satisfactory level of knowledge regarding diabetes, only 51% know how to manage their condition independently[4] .

In a similar context, *Bedhomme* and a1 found that 72% of T2D patients were unaware of any contraindications to their ADO treatment. The significance of glycated hemoglobin (HbA1c) was misunderstood by one-third of the diabetic cohort[5] .

Based on the results obtained, our intervention improved the knowledge of 47% of patients regarding diabetes self-monitoring methods and provided 54% with appropriate explanations regarding their disease and medication tailored to each patient's level of understanding.

These results demonstrate the need for patient therapeutic education to address gaps in patients' knowledge and skills.

Physical Activity and Diet in Diabetic Patients

Before the educational session, 55% of the diabetic patients in our study were aware of and followed only a few dietary recommendations, primarily limiting sugary foods. However, this partial knowledge is insufficient to ensure a balanced diet. Our intervention revealed a marked imbalance in patients' diet and physical activity, characterized by inappropriate eating habits: high consumption of added sugars, cheese, processed meats, saturated fats, as well as pastries and baked goods.

This finding aligns with the results of Sayad and a1, who observed, among 150 patients with type 2 diabetes, high consumption of foods with a high glycemic index (bread, couscous, potatoes) and low intake of dairy products and fish [6].

This dietary imbalance appears to be linked to several factors, notably lifestyle habits and the persistence of certain misconceptions. The study by Hallab and a1 illustrates this:

- 63.6% of patients believed that a person with diabetes should no longer eat fruit, which they considered too sweet, and that they should eat less than others to maintain their health.
- 40.9% believed that a person with diabetes could no longer eat like a healthy person.
- 6.8% believed, on the contrary, that they could eat whatever they wanted [7].

An unbalanced diet, combined with other risk factors such as obesity and associated conditions, increases the risk of developing cardiovascular disease.

Physical activity is estimated to be regular and adapted to blood glucose fluctuations in only 15% of patients. These results are consistent with those of a study conducted among 110 patients with T1D, which revealed that 29% of these patients engage in regular physical activity, 66% of their activities are limited to household chores and daily living tasks, and only 23% of patients received therapeutic education on physical activity[8] .

Our study showed that 55% of patients consider diet and physical activity to be the most challenging aspects of diabetes management; in some cases, this is due to a lack of motivation on the part of the patient and to physical activity that is not tailored to blood glucose levels. The lack of physical activity among diabetic patients is also linked to a lack of time (35%) and fear of hypoglycemia (30%)[8] .

Our educational approach improved the knowledge of 80% of patients regarding a balanced diet (cooking methods, selection of low-glycemic-index foods, and their adaptation based on blood glucose fluctuations) and of 70% of patients regarding physical activity, which primarily aims to teach patients the basics of regular physical exercise adapted to their blood glucose fluctuations and diet.

All of the aforementioned studies demonstrate the need for therapeutic education of diabetic patients to improve disease management[7,8].

Blood Glucose Fluctuations in Diabetic Patients

In our study, 60% of diabetic patients had only a superficial understanding of the warning signs associated with severe blood glucose fluctuations, knowledge acquired primarily through their own past experiences with hypoglycemia or hyperglycemia. The educational program implemented improved the knowledge of 47% of patients, particularly regarding the warning signs of blood glucose imbalances, the appropriate actions to take during an episode, and the importance of seeking emergency care during severe hypoglycemia. These results are consistent with those of Halbron and a1, who demonstrated the effectiveness of an educational program for patients with type 1 diabetes, resulting in a reduction in the frequency of hypoglycemic episodes, whether minor or severe [3].

Pharmacist services and their relationship with the patient'

In our study, 85% of diabetic patients consider healthcare professionals to be their primary source of therapeutic information, particularly the pharmacist. The pharmacist's advice is deemed satisfactory by 60% of patients, and the pharmacist-patient relationship is considered good in 70% of cases. These results reflect recognition of the pharmacist's central role in the management of chronic diseases and health promotion.

The patient-pharmacist relationship depends on the pharmacist's development of effective communication strategies, particularly in the field of chronic diseases, to promote the proper use of medications and ensure the success of the patient's treatment plan[9] .

Therapeutic adherence among diabetic patients

Therapeutic adherence was estimated to be average to poor in 35% of patients, a result similar to those reported by Achouri and a1 (31.3%) [2]. The study by M.P. *Ntyonga-pono* and a1 aligns with other studies, reporting a non-adherence rate of 39.8%[10] .

The analysis shows that 71% of non-adherent patients have a primary school education, compared to 29% with a secondary school education, confirming the role of illiteracy as a factor in non-adherence [2,11,12].

Furthermore, 72% of non-adherent patients have had diabetes for more than 10 years and 14% for between 5 and 10 years, suggesting a gradual decline in motivation over time, a phenomenon also demonstrated by Achouri and a1 [2]. Finally, other determinants such as family situation, socioeconomic status, health insurance, self-monitoring of blood glucose, and patient knowledge must be taken into account [2,11,12].

CONCLUSION

In Morocco, patient education remains underdeveloped, despite its essential role in the management of chronic diseases. Community pharmacists can make a significant contribution by adopting an appropriate educational approach and using specific tools to support patients in managing their disease and treatment.

The study conducted with diabetic patients in a community pharmacy demonstrated a positive impact on patients' understanding, autonomy, and treatment adherence. However, to confirm and generalize these results, it is necessary to implement a multidisciplinary

approach involving various healthcare professionals and incorporating structured, continuous patient follow-up.

REFERENCES

1. S. Frazier, "Health outcomes and polypharmacy in elderly individuals: an integrated literature review," *J. Gerontol. Nurs.*, vol. 31, pp. 4–-
2. M. Y. Achouri *and a1*, "Factors Associated with Nonadherence to Treatment in Patients with Type 2 Diabetes: A First Algerian Study," *Ann. Pharm. Fr.*, vol. 77, no. 6, pp. 506–-
3. M. Halbron, C. Sachon, D. Simon, T. Obadia, A. Grimaldi, and A. Hartemann, "Evaluation of a therapeutic education program for type 1 diabetes: a single program can achieve different objectives through a patient-centered approach," *Médecine Mal. Métaboliques*, vol. 8, no. 1, pp. 73–-
4. F. Aziouaz, S. Rouf, Y. Yaden, and H. Latrech, "Evaluation of the therapeutic education program for patients with type 1 diabetes and their families within the endocrinology department in Oujda," *Ann. Endocrinol.*, vol. 77, no. 4, p. 512, Sept. 2016, doi: 10.1016/j.ando.2016.07.790.
5. S. Bedhomme, B. Roche, M. Ramin, I. Tauveron, and B. Vennat, "The Role of the Community Pharmacist in Therapeutic Education for Diabetic Patients," *Médecine Mal. Métaboliques*, vol. 6, no. 5, pp. 435–-
6. N. O. Sayad, S. Ridouane, and L. Essaadouni, "Dietary habits of type 2 diabetic patients living in Marrakech, Morocco," *Médecine Mal. Métaboliques*, vol. 3, no. 5, pp. 544–-
7. L. Hallab, A. Chadli, D. Nsame, S. Elaziz, H. El Ghomari, and A. Farouqi, "Beliefs and food practices of obese type 2 diabetics in Morocco," *Médecine Mal. Métaboliques*, vol. 6, no. 3, pp. 244–-
8. Z. Boulbaroud, S. E. Aziz, A. Mjabber, and A. Chadli, "Physical activity among young people with type 1 diabetes: assessment of knowledge and barriers," *Ann. Endocrinol.*, vol. 79, no. 4, p. 467, Sept. 2018, doi: 10.1016/j.ando.2018.06.893.
9. A. Vandesrasier, C. Thoër, and M.-T. Lussier, "Toward Effective Communication in Pharmacy: An Approach Based on Contextualizing the Pharmacist-Patient Interaction," *Commun. Rev. Commun. Soc. Publique*, no. 17, Art. no. 17, Dec. 2016, doi: 10.4000/communiquer.1933.
10. L. Bjerrum, B. Gonzalez Lopez-Valcarcel, and G. Petersen, "Risk factors for potential drug interactions in general practice," *Eur. J. Gen. Pract.*, vol. 14, no. 1, pp. 23- 29, Jan. 2008, doi: 10.1080/13814780701815116.
11. "Adherence to antidiabetic treatment among diabetic patients in Gabon: preliminary data," *Educ. Thérapeutique*, vol. 9, p. 5, 2015.
12. H. Lamiaa, C. Asmaa, E. G. Hassan, and F. Ahmed, "P71—Therapeutic Adherence in Type 2 Diabetics: Preliminary Results," *Diabetes Metab.*, vol. 37, no. 1, Supplement 1, p. A52, March 2011, doi: 10.1016/S1262-3636(11)70697-8.
13. D. S. Chakdoufi, "Therapeutic Adherence in Patients with Type 2 Diabetes," p. 2, 2017.