

Patient's Adherence to Insulin Pen At prince Ali Bin Al Hussein Hospital in Jordan

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Abstract—Diabetes mellitus is an extended metabolic disorder and disease that has an important financial freight on the healthcare organization associated with intended and unintended medical costs, loss of effectiveness, and premature death unless controlled. **Objectives:** evaluating the adherence toward insulin therapy among patients with diabetes with insulin pen compared to old-style insulin treatment. **Methods:** The examination was conducted by a cross-sectional, and patients were recruited. The client adherence survey was achieved in an internal clinic of medicine by a clinical pharmacist and a nurse using a designed interview technique (face-to-face) where the affected role was asked questions, a questionnaire consisting of demographic statistics, nature of insulin applied, and inquiries concerning patient adherence to the use insulin pen regimen. Results were analyzed and evaluated by using the program SPSS version 21. **Results:** A high ratio of patients from the insulin pen users (87%) found that the method simple to use as compared to the conventional insulin. **Conclusion:** there is a general and very good impression that there is general education for diabetics, and that patients who use pre-filled pens and insulin pens are the ones who adhere well to their treatment and that they are less likely to have complications from low and high blood sugar.

Keywords— Type I, Type II Diabetes Mellitus, Insulin pen, Adherence.

I. INTRODUCTION

The types of diabetes mellitus are an extended metabolic disorder and disease that has an important financial freight on the healthcare organization associated with intended and unintended medical costs, loss of effectiveness, and premature death unless controlled [1, 2]. Because of an individual's publicity to diabetes, numerous complications might arise in the long period, inclusive of kidney disorder that leads to kidney impairment and failure, and retinopathy that results in vision injury. Similarly, we should mention peripheral neuropathy, that may additionally moreover result in amputation of the peripheral limbs.

Cardiovascular disease is the most important complication that arises from uncontrolled diabetes leading finally to death [3]. Associated diseases and a rise in the percentage of death can result from long-standing imbalances in glucose levels and defects in metabolic function. More risks arise from uncontrolled sugar and hyperglycemia [4].

Diabetes is classified and divided into two categories; Type I, which corresponds to 10%, Type II, which accounts for 90% and occasionally gestational diabetes. several approaches are used to regulate high sugar levels, both type I and type II diabetes, many methods are used, and the greatest methods are lifestyle modification and exercise regularly, also is imperative to follow a dietary program and watch carefully its effects.

Sooner or later, diabetics must be treated, whether by using pills or using insulin, even after they follow a diet and regularly change their lifestyle [5].

Diabetes has many physical, commercial, and good loads, particularly the second kind of diabetes, accordingly, there is widespread attention to the patients' assurance to take his behaviors and determined them to diminish what was earlier mentioned regarding the disease and the symptoms related to diabetes.

In the past, and in many studies, the use of any type of insulin by patients of the second type is of great importance, as this research focused on the importance of the commitment of insulin users and their satisfaction with that, and for this reason, this research was chosen to talk about them [6, 7]. Their use of prescribed doses of insulin, or even those who use pills and others [8].

Numerous new studies indicated that many diabetics who used any type of insulin with special pens, and even those who had the share of using them for the first time, that there is a very good adherence to the treatment because there is ease and simplicity in use after comparing who used insulin, whether with bottles or those who used syringes [9-11]. Several forms and methods for using insulin therapy, include multi-use vials, previously filled pens, and cartridge pens. The new methods, such as pens, have shown excellent results for diabetic patients, whether in the results of blood sugar analysis or even their commitment to treatment. In addition to that, the number of diabetic patients who go to the emergency room, whether due to high or even low blood sugar, has decreased significantly, which ultimately led to a decrease in costs, worse in patients' admissions to the hospital or even in their treatment in the emergency department [1, 12, 13].

The main objective of this study is to reveal the extent of adherence of patients with type II diabetes who use previously unfilled insulin pens or cartridges, and their pleasure with this method compared to the old method.

II. METHODS

The examination was conducted by a cross-sectional, and patients were recruited. two hundred patients asked throughout the period of 1st March to 1st April 2023. The client adherence survey was achieved in an internal clinic of medicine by a clinical pharmacist and a nurse using a designed interview technique (face-to-face) where the affected role was asked questions, a questionnaire consisting of demographic

statistics, nature of insulin applied, and inquiries concerning patient adherence to the use insulin pen regimen. Results were analyzed and evaluated by using the program SPSS version 21

III. RESULTS

twenty-three patients refused to participate in this study, while others agree and were satisfied with this study. Demographic features of the 177 patients finishing the study are recorded in Table 1, (177) patients joined this study, percentage of 87% stated that they are dedicated to taking insulin dosages, owing to the existence of insulin prefilled and pens, which make the use of them easier, owing to the technique of use or else the precision of pain triggered by the puncture of needles.

TABLE 1. A Baseline demographic characteristics of participants

Demographics	No. (%)
Gender	
Male	102 (57.6%)
Female	75(42.4%)
Age (yr.)	
18-30	22 (12.4%).
31-40	17 (9.6%).
41-50	95 (53.6%).
51-60	32 (18.1%).
>60	12 (6.2%).
Marital status	
Married	170 (96.0%)
Single	5 (2.8%)
Deforced, widowed, etc.	3 (1.1%)
Diabetes length (years)	
<5 years	7(3.95%)
5-10	81(45.7%)
11-20	67(37.8%)
>20	22(12.4%)
Patient compliance	
compliant	153 (87.2%)
Non-compliant	24 (13.8%)

The number of participants in the research was one hundred and seventy-seven, divided into 102 men (57.6%) and 75 women (42.4%), and the average age was approximately 41-50 years (53.6%), and most of the members were married (96.0%), and the years of diabetes were not less than 8 years, and the arithmetic mean was approximately 8 years. When the patients were questioned, it was found that 97 % used the insulin pens that were prescribed for them and the insulin that was prepacked. When asked when they knew how to use and how easy it was, they reported that the method used, which they learned from the education clinic specially designed for diabetics, is a simple and easy method, and the pain ratio is almost non-existent and that preparing them to give insulin using pens takes less time, effort, and knowledge than those used in the multi-use vials method.

Most of the members felt more self-confident getting a precise dose of their insulin when using insulin device pen than insulin syringes and vials (91%), 85% of the participants sensed happier using insulin pens associated with insulin vials, and 91% believed that insulin pen is a development concluded the vials.

TABLE 2: Answers of diabetic patients using insulin pens and insulin vials

Review Items	Agree	Have no idea	Don't Agree
The technique used is modest and easy.	168	2	7
It took me less period to make and handle insulin by using insulin pens rather than vials.	159	8	10
I felt more self-confident getting the accurate dose of Insulin pens rather than with insulin syringes and vials.	163	3	11
I felt happier using insulin pens among vials.	170	2	5
An insulin pen is a development over insulin vials.	156	2	19

IV. DISCUSSION

The members exhibited important informative skills in using an insulin pen and ease throughout the use of the insulin device in the existing study. The conclusion of this study discovered respectable adherence to insulin devices and pens in spite of many studies showing a deprived adherence.[12]

The outcomes that we consume are contrary to the outcomes of furthestmost of the earlier studies, which showed the weak obligation of the participants to insulin treatment [14].

An insulin device and pen use are accompanied by lesser ratios of hypoglycemia, improved adherence rate, and improved perseverance, leading to improved glycemic control [15].Confirmation of what was stated that the high and good percentage of those who use insulin devices and previously filled pens, in adding to their proper commitment, confirms that properly educating and educating the diabetic patient reduces the diseases and complications associated with high blood sugar, This is one of the main causes of other successive and essential diseases over a long period of time, including atherosclerosis, blood vessels, heart disease, retinopathy, and other diseases, including kidney failure [16].

Almost 95% of patients suffering from diabetes stated that the technique of using the pen is easy and simple, and furthestmost of them acclaimed that the period taken to handle and prepare the proper dose of insulin is simpler and so fast compared to that used by insulin vials. The major ratio of participants established that when using an insulin pen, they feel more confident that they had the accurate and correct dose, not like those got from insulin vials, which may need more education and skills.

The existence of the use of the indicator located in the insulin pen and the audible sense of the crackling of the pen when the dose is prepared is a good indicator that the dose was calculated in the correct way. The majority of those who used pre-filled insulin pens and insulin packaging devices enjoyed a high satisfaction rate compared to those who used multi-use insulin injections, as all of them reported that the rates of low and high blood sugar decreased to a very small percentage, and therefore most of them confirmed that the most appropriate solution and the right choice is to use insulin pens.[17]

V. CONCLUSION

Based on what was stated in this study, there is a general and very good impression that there is general education for diabetics, and that patients who use pre-filled pens and insulin pens are the ones who adhere well to their treatment and that they are less likely to have complications from low and high blood sugar, and such studies should be generalized to More medical centers and a larger number of patients.

REFERENCES

1. Goldstein, H.H., *Pen devices to improve patient adherence with insulin therapy in type 2 diabetes*. Postgrad Med, 2008. 120(3): p. 172-9.
2. *Standards of Medical Care in Diabetes—2015: Summary of Revisions*. Diabetes Care, 2014. 38(Supplement_1): p. S4-S4.
3. Walter, K.N., et al., *Substance Use Disorders among Patients with Type 2 Diabetes: a Dangerous but Understudied Combination*. Current Diabetes Reports, 2017. 17(1): p. 2.
4. Sarwar, N., et al., *Diabetes mellitus, fasting blood glucose concentration, and risk of vascular disease: a collaborative meta-analysis of 102 prospective studies*. Lancet, 2010. 375(9733): p. 2215-22.
5. Jellinger, P.S., et al., *Road maps to achieve glycemic control in type 2 diabetes mellitus: ACE/AACE Diabetes Road Map Task Force*. Endocr Pract, 2007. 13(3): p. 260-8.
6. Inzucchi, S.E., et al., *Management of hyperglycemia in type 2 diabetes, 2015: a patient-centered approach: update to a position statement of the American Diabetes Association and the European Association for the Study of Diabetes*. Diabetes Care, 2015. 38(1): p. 140-9.
7. Asche, C.V., L. Shane-McWhorter, and S. Raparla, *Health economics and compliance of vials/syringes versus pen devices: a review of the evidence*. Diabetes Technol Ther, 2010. 12 Suppl 1: p. S101-8.
8. Cuddihy, R.M. and S.K. Borgman, *Considerations for diabetes: treatment with insulin pen devices*. Am J Ther, 2013. 20(6): p. 694-702.
9. Xie, L., et al., *Impact of initiating insulin glargine disposable pen versus vial/syringe on real-world glycemic outcomes and persistence among patients with type 2 diabetes mellitus in a large managed care plan: a claims database analysis*. Diabetes Technol Ther, 2014. 16(9): p. 567-75.
10. Kamrul-Hasan, A.B.M., et al., *Comparison of simplicity, convenience, safety, and cost-effectiveness between use of insulin pen devices and disposable plastic syringes by patients with type 2 diabetes mellitus: a cross-sectional study from Bangladesh*. BMC Endocr Disord, 2023. 23(1): p. 37.
11. Cheen, H.H., et al., *Adherence to premixed insulin in a prefilled pen compared with a vial/syringe in people with diabetes in Singapore*. Clin Ther, 2014. 36(7): p. 1043-53.
12. Yavuz, D.G., S. Ozcan, and O. Deyneli, *Adherence to insulin treatment in insulin-naïve type 2 diabetic patients initiated on different insulin regimens*. Patient Prefer Adherence, 2015. 9: p. 1225-31.
13. Peyrot, M. and R.R. Rubin, *Perceived medication benefits and their association with interest in using inhaled insulin in type 2 diabetes: a model of patients' cognitive framework*. Patient Prefer Adherence, 2011. 5: p. 255-65.
14. Spann, S.J., et al., *Management of type 2 diabetes in the primary care setting: a practice-based research network study*. Ann Fam Med, 2006. 4(1): p. 23-31.
15. Sorli, C. and M.K. Heile, *Identifying and meeting the challenges of insulin therapy in type 2 diabetes*. J Multidiscip Healthc, 2014. 7: p. 267-82.
16. Aronson, R., *The role of comfort and discomfort in insulin therapy*. Diabetes Technol Ther, 2012. 14(8): p. 741-7.
17. Ramadan, W.H., N.A. Khreis, and W.K. Kabbara, *Simplicity, safety, and acceptability of insulin pen use versus the conventional vial/syringe device in patients with type 1 and type 2 diabetes mellitus in Lebanon*. Patient Prefer Adherence, 2015. 9: p. 517-28.