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Research Article

Impact of Clinical Pharmacist-Mediated Pharmaceutical Care Using WHO Medication Safety Programme Through Dispensing Covers and Auxiliary Labeling- A Randomized Control Trial

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ABSTRACT:
Aim & Objective: The aim of this study was to assess the impact of clinical pharmacist-mediated2 care on medication knowledge in Type II Diabetes Mellitus (T2 DM) patients and medication adherence.
Methodology: A forward-looking observational study was undertaken in the General Medicine departments, encompassing both inpatients and outpatients. Departments at GGH, Kadapa. for six months by recruiting 112 subjects and having two follow-up visits. Subjects with Type 2 diabetes who were provided with written informed consent were included and divided into Groups A and B. Subjects in Group B received education using dispensing covers and leaflets at each follow-up, whereas no structured education to subjects in Group A. The questionnaire used was the Morisky Scale (MMAS-8) for Medication Adherence at baseline and the following follow-ups. Data were evaluated using the Graph Pad Prism software. Results: Among 112 subjects who participated in the study, 56 were Grouped as A and the other 56 Group B. Most of the study subjects were males (69%), with the majority between 61 and 65. At baseline, the mean fasting blood sugar (FBS) values of subjects in group A were 151.89 ± 52.751 and 166.60 ± 56.25 in group B. During the most recent follow-up, the blood sugar levels during fasting (FBS) and postprandial (PPBS)in group B subjects were comparatively lower ($p<0.05$) than those in group A subjects. **Conclusion:** The findings of this study imply that clinical pharmacist-mediated structured education has a beneficial effect on medication knowledge and adherence, which is a key factor in diabetes management.

KEYWORDS: Medication familiarity, Medication conformity, Diabetes type 2, patient education, glycemic control.

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INTRODUCTION:

Diabetes is a chronic metabolic illness defined by excessive blood glucose levels due to the pancreas failure to produce enough insulin. Whereas diabetes mellitus which causes insulin resistance[1,2]. Type 1 diabetes, also called Diabetes insipidus or juvenile, is a long-term condition in which trace amount of insulin is produced by the pancreas. Therefore, it is commonly referred to as insulin-dependent diabetes. This is caused by the autoimmune destruction of pancreatic beta cells[3]. Although diabetes insipidus usually occurs during childhood or adolescence, it can also be seen in adulthood. Diabetes mellitus causes inadequate insulin utilization (insulin resistance)[4]. Adult-onset diabetes includes risk factors like genetic susceptibility, physical inactivity, and obesity[5]. Most of the individuals with non-insulin-dependent diabetes exhibit abnormal obesity, which causes insulin resistance. The latest estimate by the International Diabetic Federation (IDF), suggests that about 537 million people are living with diabetes

globally and they presume it could increase to 643 million by 2030[6]. International Diabetes Federation predicted that 463 million people globally will have diabetes by 2020, including 88 million people in Southeast Asia region[7]. In India, 77 million individuals suffer from diabetes mellitus. Diabetes prevalence grew from 1980 to 2014, the population increased from 108 million to 422 million.

Diabetes was the tenth biggest cause of death in 2019, accounting for an estimated 1.5 million fatalities caused directly by excessive blood sugar levels[8].

Knowledge of adult-onset diabetes is associated with improved medication adherence and glycemic control[9]. Poor understanding and habits among diabetics are some of the characteristics impacting the disease's progression and problems, which are mostly preventable by imparting knowledge about medication use, which reduces long-term complications. 'Adherence' is defined by WHO as "how closely a person's actions, such as medication intake, dietary adherence, and lifestyle adjustments, align with the guidance provided by healthcare professionals". Medication adherence is a significant universal factor impacting subject health outcomes, particularly in enduring illnesses such as diabetes.

Inadequate compliance with anti-diabetic medication can result in treatment failure, resulting in diabetes-related complications such as microvascular and macrovascular changes in the retina, neurons, and nephrons, which reduce quality of life and increase medical care costs. These elements are signs of medication nonadherence and should be carefully evaluated and managed accordingly[10,11]. Patient education is giving physical, psychological, and social information on treatment results in health care[12]. The goal of this study was to assess people's diabetes knowledge as well as their medication adherence and the association between a person's diabetic knowledge, its impact on medication adherence, and blood glucose levels.

AIM AND OBJECTIVES:

This study evaluates the influence of clinical pharmacists on medication awareness and adherence among patients with Type II diabetes.

OBJECTIVES:

The key objectives of the study include:

- To separate diabetic subjects based on their demographic parameters.
- To assess the patient's knowledge about medication usage among diabetic subjects.
- To achieve optimum medication adherence through patient education.
- To compare the knowledge before and medication adherence pre-and post-educational intervention.
- To develop dispensing covers as an aid to enhance patient adherence.

METHODOLOGIES:

Study design and duration:

A forward-looking observational study was undertaken in the General medicine department, encompassing both inpatients and outpatients departments at GGH, Kadapa. The trial spanned six months, from December 2021 to May 2022.

Source of data:

Case sheets, interviews, and questionnaire forms were used to collect information from research participants. Sample size: A sample of 112 subjects were recruited.

Inclusion criteria:

All subjects of either gender with Diabetes mellitus for at least one year of disease history.

Subjects with poor glycemic control or poor medication adherence.

Subjects with other co-morbidities.

Exclusion criteria:

Women with Gestational diabetes mellitus, lactating women, and pediatrics.

Subjects with end-organ failure.

Subjects unwilling to participate in the study.

Method of data collection:

The Research study was conducted in the Department of General Medicine, Government General Hospital, Kadapa. Following an explanation of the study methodology, the study participants submitted informed consent.

Study Tools:

The Morisky Medication Adherence Scale with 8-Item:

The 8-item Morisky Medication Adherence Scale was used to assess adherence.Adherence was categorized into three categories based on the scores obtained by individual Subjects:

- Low adherence <6
- Moderate adherence6-8
- High adherence>8

1. American Public Health Association (APHA) Foundation Knowledge questionnaire:

Knowledge was assessed by using the American Public Health Association (APHA) Foundation questionnaire and the knowledge was categorized into three categories based on the scores obtained by individual subjects:

- Beginner<25
- Proficient25-31
- Advanced32-36

Study tools like dispensing covers and leaflets were used to obtain optimum medication adherence.

2. Dispensing covers, and leaflets:

Self-prepared dispensing covers and leaflets prepared in the local language were distributed to the Subjects which were used as an aid in patient education.

Statistical Analysis:

- Data was collected from recruited subjects and entered into a Microsoft Excel sheet.
- Graphs were plotted using Microsoft Excel.
- Descriptive statistical analysis like mean, standard deviation, and sample percentage were used to calculate

the demographic data of all subjects.

- TWO-WAY ANOVA (Analysis of Variance) was used to determine statistically significant variation between groups A and B.

RESULTS:

We included 112 patients based on inclusion criteria and were followed up for 2 visits. Our study sample size was 112. Subjects were randomized into Group A (Medications) and Group B (Medication+ Patient education). Out of them (56 from Group A and 56 from Group B) completed all follow-ups of the study. All the study subjects were classified based on gender which is shown in figure 1 with male predominance of 69%.

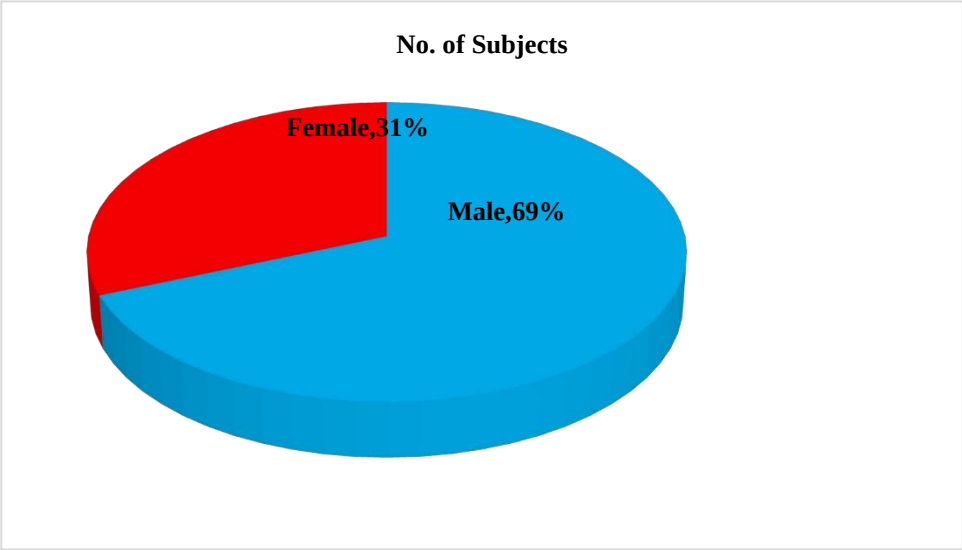

Fig:1 Graphical Representation of Percentage Distribution based on Gender

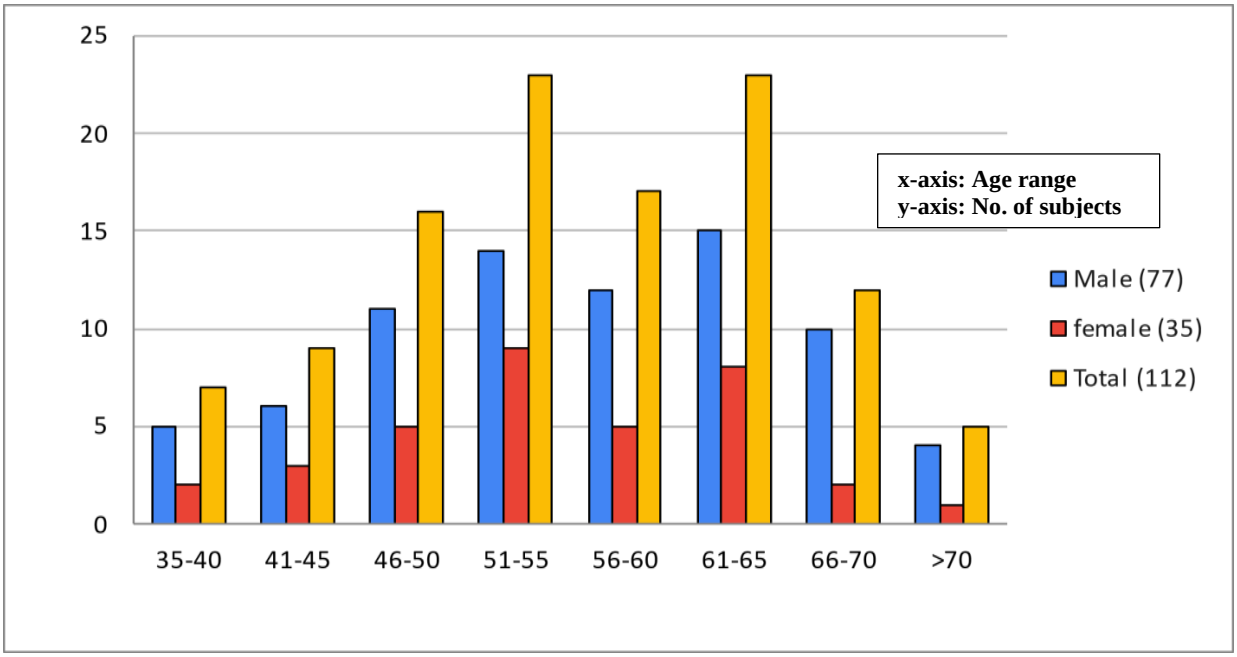

Fig:2 Distribution of samples based on age groups

Subjects were classified into age groups as shown in figure 2 and the subjects were in the age group of 60-65 years.

Subjects were classified depending on their co-morbidities. Hypertension is the most prevalent comorbidity among patients with type 2 diabetes mellitus. Other comorbidities are shown in figure 3.

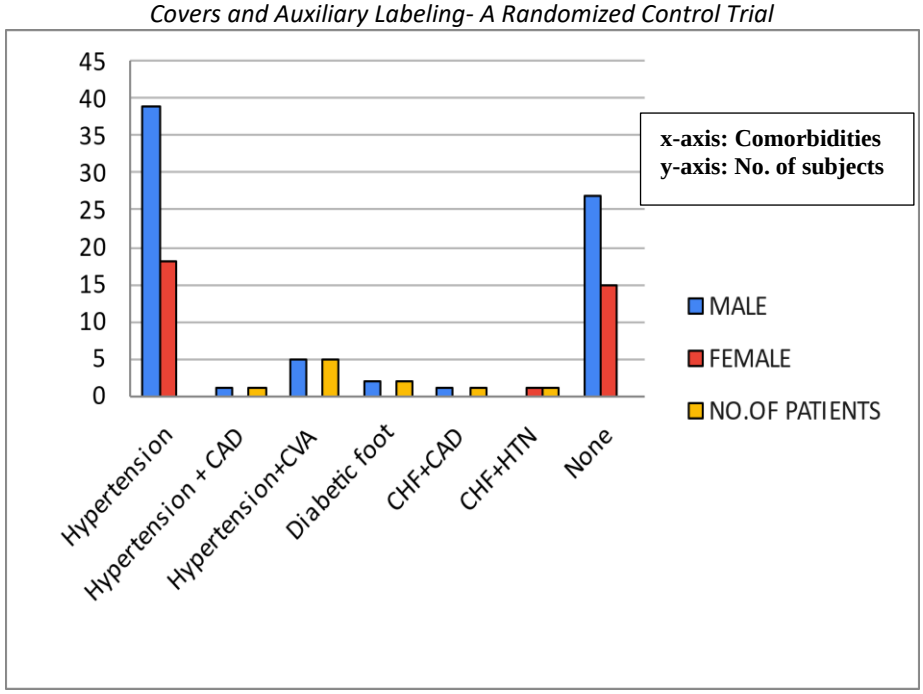

Fig 3: Co-morbidity-based sample distribution

- Fig. 4 shows that patients in group B (Medication + Patient Education) had higher baseline knowledge at final follow-up than group A (Medications).
- Adherence was categorized as low, medium, or high based on scores.
- Compared to Group A, Group B subjects had higher adherence from baseline to final follow-up.

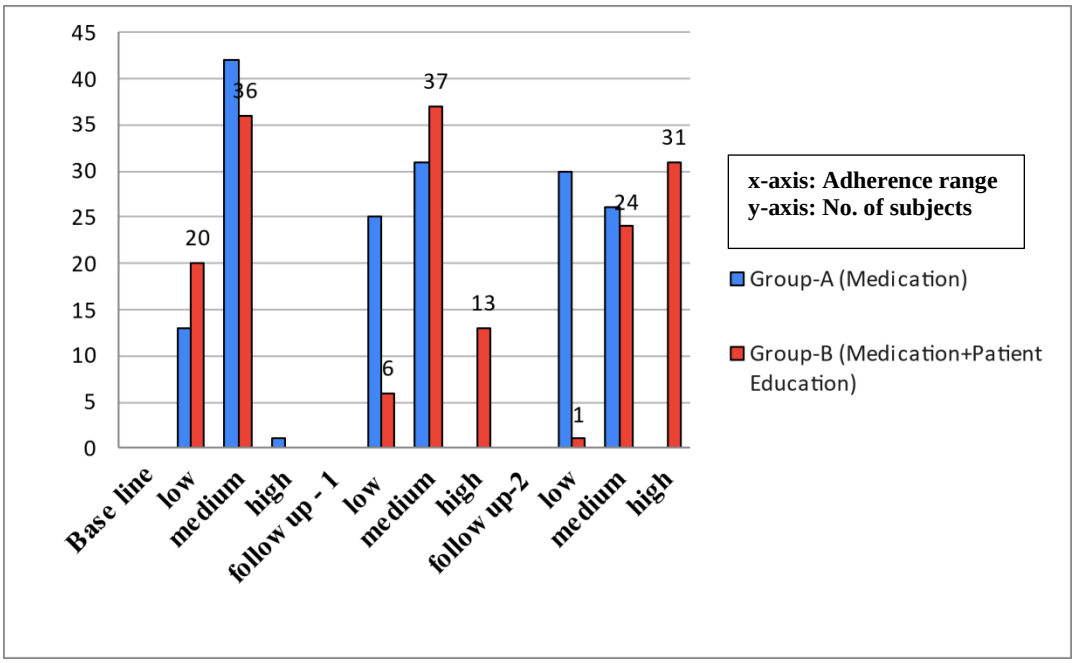

Fig:4 Comparison of Adherence in Group A and Group B

- Group B (Medications + Patient Education) had lower glycemic control than Group A (Medications), as shown in Figure 5.
- Group A had an average fasting blood sugar level of 151.89 ± 52.751 at baseline and 180.73 ± 55.83 at final follow-up. Post-prandial blood sugar readings were 217.94 ± 74.58 and 245.32 ± 56.87.
- In group B FBS levels at baseline and final follow-up were 166.60 ± 56.25 and 135.57 ±32.60 and PPBSlevelswere240.16±79.99 and195.51±52.51respectively.
- The p-value of FBS (<0.0001) and PPBS (0.0002) was found statistically significant by using TWO-WAY ANOVA

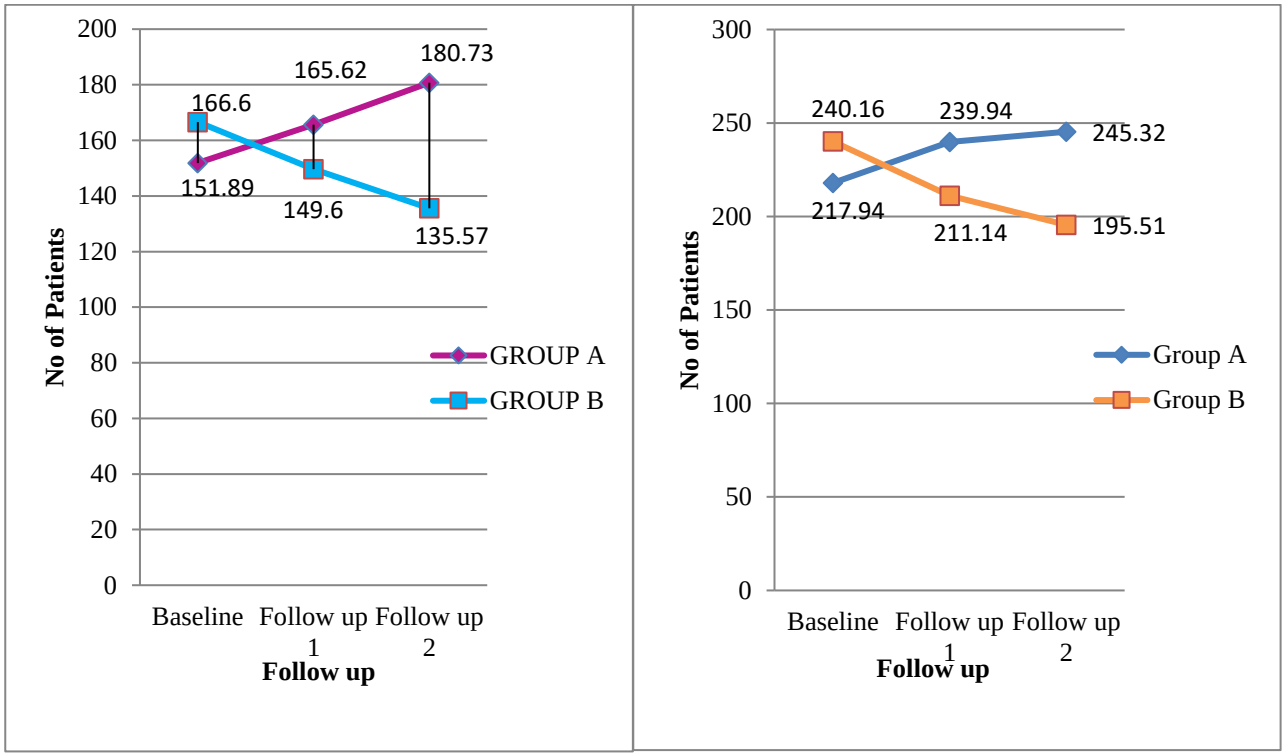

Fig:5 Comparison of Group A and Group B based on glycaemic control

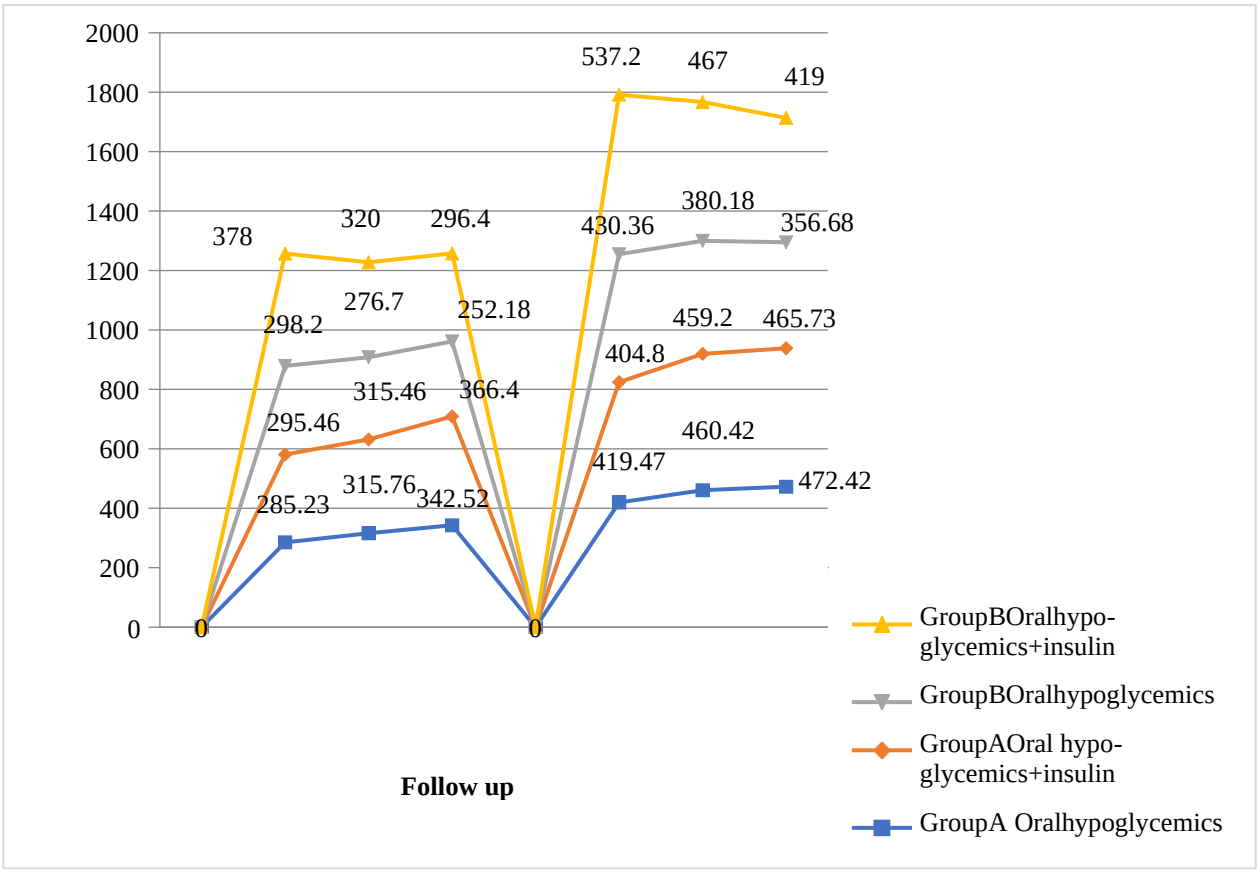

Fig:6 Comparison of Group A and Group B based on treatment

In Fig. 6, we categorized the patients into Group A (Medications) and Group B (Medications+ Patient education)

based on treatment. The glycaemic levels of Group B have decreased compared to Group A. The P-value (<0.0001) was found statistically significant using two-way ANOVA

DISCUSSION:

FBS and PPBS levels reduction can be seen from baseline to follow-up, similar to the study conducted by Krishnaveni Kanda Samy et.al., Pharmacist involvement had an important impact on disease severity, knowledge, and drug adherence. A significant decrease in FBS level was found from baseline to final follow-up, indicating a positive influence of ongoing Patient Educationindiabetestreatment[13.]

The present study showed that males were slightly higher than females in the age group between 61-65.

In this study, most of the subjects had high adherence (31) moderate adherence (24), and low adherence (1) on follow-up after providing patient education which was similar to the study conducted by Olufunsho et al, in which overall improvement in adherence rate of 86.8% was observed with a decline of non-adherence rate after interventions were made[14].

In the current study, the majority of the subjects were at an advanced stage (31), proficient (25), and beginner (0) after the final follow-up of providing patient education, conducted by Chethana Rame Gowda et al, and was a significant improvement in knowledge after health education[15].

CONCLUSION:

We conclude effective medications that meet individual subjects' needs with proper health education can improve diabetic subjects' knowledge with increased awareness. Health education is appropriate for people of all ages, genders, and educational levels. The implementation of a standard strategy inpatient education using dispensing covers, pamphlets, or booklets had an impact on diabetes subject's health education. Education can be considered as an integral part of the treatment which helps to make treatment Plans for each patient for his/her education accessibility of clinical pharmacists or health care professionals to diabetic patients should be made easy which helps to raise awareness about diabetes and prevent further difficulties.

DECLARATION:

Regarding this work, the authors have no conflicts of interest.

PATIENT CONSENT: Yes

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