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Physicians' Acceptance of Pharmacists' Intervention involving prescription review and risk assessment in Type 2 Diabetes Mellitus Patients Attending three Healthcare Facilities, Ilorin

Fullaila Onozare Aliyu[1]; Suraja Surajudeen-Bakinde[1]; Shakirat Iyabo. Bello[1]; Mariam Abdulbaki[2]

[1]Faculty of pharmaceutical sciences, Dept. of clinical pharmacy and pharmacy practice, University of Ilorin, Ilorin, Nigeria
[2]Department of Obstetrics and Gynecology, Kwara State University Teaching Hospital Ilorin, Ilorin, Nigeria.

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**Corresponding Author:*
Fullaila Onozare. Aliyu
Tel: +23470393929l3
Email: aliyu.fo@unilorin.edu.ng

ABSTRACT

INTRODUCTION: Clinical pharmacists review medication orders from prescribers to avert drug-related problems (DRPs). The aim of the study was to assess physician acceptance rate of pharmacist's intervention in out-patients with type 2 diabetes mellitus attending three healthcare facilities.
METHOD: This study was a prospective study (N=138) among out-patients with Type 2 Diabetes mellitus attending three health facilities. Interventions involved DTP checks, dyslipidemia/CKD risk blood tests, Framingham risk, and physician notification. Study was carried out between the months of September 2023 to October 2023. For categorical parameters, the frequencies were calculated, and the results were expressed in descriptive statistics using chi-square, p-value < 0.05 was considered as statistically significant.
RESULTS: Of the respondents 61.6% (85) were females while 38.4% (53) were males. Age range of 60-69 had the highest response (41, 29.7%). Overall physician acceptance rate of pharmacist's interventions was 100.0%. The most common interventions accepted by physicians include addition of statins to respondent's medications due to moderate to high cardiovascular disease risk score, need to monitor lipid profile, and institution of adherence program.
CONCLUSION: Overall physician acceptance rate of pharmacist's interventions was 100.0%. The most commonly accepted were adding statins for patients with moderate to high cardiovascular risk, monitoring lipid profiles, and initiating adherence programs for non-adherent patients.

INTRODUCTION

Clinical pharmacists are vital healthcare professionals who can help reduce prescription errors and create a safe medication environment[1]. To avoid drug-related problems (DRPs), clinical pharmacists examine prescribers' medication orders and offer suggestions for improving pharmacotherapy, which the prescriber may then consider[2]. It has been demonstrated that in high-income countries, the acceptance rate of therapeutic interventions from clinical pharmacists ranges from 52 to 100%[2]. Pharmacological problems that affect the intended health outcomes, either directly or indirectly, are known as drug-related problems (DRPs)[2]. Patients with Type 2 Diabetes Mellitus (T2DM) have DRPs frequently; on average, four DRPs occurring in each patient[3]. Findings indicate that significant research and data exist regarding clinical pharmacy operations in

Nigeria, covering service provision, challenges, and evolving roles of pharmacists in patient care[4,5]. Available literature reveals a limited number of studies in Nigeria that specifically assess physicians' acceptance of pharmacists' interventions involving both prescription review and cardiovascular risk assessment in patients with type 2 diabetes mellitus (T2DM).

Most previous research on physician acceptance rate concentrated on interventions provided by clinical pharmacists who were part of the multidisciplinary care team during ward rounds[2]. According to a research conducted by Bedouch et al. (2009), drug-related problems persist even after the adoption of a computerized physician order entry (CPOE) system in France. It was postulated that routine clinical pharmacist participation in clinical medical rounds could aid in the detection of DRPs. The study concluded that by such collaboration, pharmacists should be able to improve patient safety[6]. DRPs could be caused by a variety of conditions. Liver and/or renal failure can alter the pharmacokinetics of dyslipidemic and anti-diabetic drugs hence can cause DRP[3]. T2DM and dyslipidemia contribute significantly to cardiovascular complications; thus, optimizing therapy through DRP detection and prevention is critical[3]. Pharmacists ensure effective administration of drugs in a variety of settings, including administrative, distribution, clinical, and educational settings. An expanding body of research has demonstrated the clinical and economic value of clinical pharmacists as integral members of the healthcare team[7].

Over the years, there has been inequity and unseen conflicts over the supremacy of Nigeria's healthcare system, resulting in a significant setback in the use of collaborative care models. There have been consistent records from various studies[8-10]. showing that perception, attitude, and barriers have great effects on physician-pharmacist collaboration within the healthcare system as the medical profession perceives it as an encroachment of the pharmacist into their excluded right of direct care to the patient and the pharmacist perceives it as a marginalization of their profession. Negative attitudes between physician-pharmacist can result in negative collaborative care[11]. The majority of the studies undertaken on physician-pharmacist collaborative care in the Nigerian health care system were observational studies[11].

In Nigeria, available data on physician acceptance of pharmacists' interventions remains limited[2]. To the best of our knowledge, no interventional study has specifically examined physician acceptance of pharmacists' interventions involving prescription review and risk assessment in patients with type 2 diabetes mellitus. This study aims to evaluate the level of physician acceptance of pharmacists intervention in T2DM patients and implement such interventions.

METHODS

Study site description

The study was carried out at the General-Out Patient Department (GOPD) clinic in three health facilities, namely- Adewole Cottage Hospital, Civil Service Hospital and Olanrewaju Hospital.

Adewole Cottage Hospital is a State owned Hospital in Adewole, Ilorin West Local Government Area of Kwara State. It was founded on January 1, 1990, runs 24 hours a day, and is classified as a Secondary Health Care Centre.

Olanrewaju Hospital was founded in 1986. Dr Idowu Olanrewaju and Dr Abdul Razak Jimoh oversaw the institution. The hospital relocated to its current location in May 1999, while Dr. AbdulRazak Jimoh moved on to established Delnik Hospital.

The Civil Service Hospital is a public hospital in Ilorin East Local Government, Kwara State. It was founded on August 6, 1982, and opens 24/7. It is a secondary healthcare facility.

Study design

This study was a prospective interventional study carried out among out-patients with T2DM attending three secondary health facilities.

Study population:

Respondents with type 2 diabetes mellitus attending General Out-Patient Ward.

Inclusion Criteria

- Patients with T2DM.
- Patients willing to give informed consent.
- Patients above 18 years

Sampling Technique

Convenient sampling of eligible respondent and who consent to participate

Sample size determination: sample size was determined using Fisher formular Thus, $\mathbf{n=Z^2pq/d^2}$ where Z=standard normal deviate corresponding to 95% confidence interval was set at 1.96, p=proportion in the target population (Physician acceptance of pharmacists intervention) estimated to have a particular characteristic set at 90%[12] i.e.

0.90, q=1-p(proportion in the target population not having the particular characteristics), d=degree of accuracy required, usually set at 0.05 level.
This study used a total sample size of 138 patients.

Data Collection- Respondent recruiting took place at the GOPD clinics together with their physicians. Three physicians, one from each of the health facilities agreed to partake in this study. All individuals who met the inclusion requirements were chosen. Informed consent was acquired, and respondents were counseled properly. A validated proforma was administered to obtain all relevant information and it was divided into five sections. Section A: Respondent's Demographic Information, Section B: Medical History and vital signs, Section C: Drug Therapy Problems using the Pharmaceutical Care Network Europe (PCNE) Criteria Version 9.0 (dosage too high, Costs of medications too high, unnecessary drug therapy, patients adherence, additional monitoring required, adverse drug effect, need pharmacokinetic monitoring, and drug interaction), Section D: Medication Adherence Questionnaire (MAQ) and Section E: Interventions for the Physician and factors that affect their acceptance. Blood samples were obtained in a vacutainer by a phlebotomist, stored appropriately and then carried to the diagnostic center where low density lipoprotein cholesterol (LDL-C), high density lipoprotein cholesterol (HDL-C), Serum Creatinine, and fasting blood sugar (FBS) values were calculated.
As the respondents' clinical and metabolic parameters were obtained from the laboratory, the Framingham cardiovascular disease (CVD) risk score was calculated
From respondents' serum creatinine value, the creatinine clearance was calculated.
DTP was assessed primarily through a review of medication, medical, and biochemical data. Drug interactions were assessed with WebMD's drug interaction checker, adherence was assessed using the Medication Adherence Questionnaire (MAQ). The MAQ is a four-item self-report survey that asks respondents about their previous medication-taking experience. The responses are in 'yes' or 'no' format and each item is scored 1(yes) or 0 (no). The questions are as follows: Item 1: Do you ever forget to take your medication? Item 2: Are you careless at times about taking your medicine? Item 3: When you feel better, do you sometimes stop taking your medication? Item 4: Sometimes if you feel worse when you take the medicine, do you stop taking it? The MAQ yields two factors: unintentional (Items 1 & 2) and purposeful non-adherence (Items 3 & 4).

INTERVENTION
After the results of each patient was obtained, the CVD risk was calculated from the Framingham cardiovascular risks score; adherence was assessed using the Medication Adherence Questionnaire (MAQ)[13]; DTP was assessed primarily through a review of medication, medical, and biochemical data. Drug interactions were assessed with WebMD's drug interaction checker[14]. The physician was notified during the next clinic day.
The Framingham cardiovascular disease (CVD) risk score was calculated, and for those with moderate to high CVD risks score the physician was notified either or not to include medications (statins) for dyslipidemia in the respondents regimen.
For respondents with poor adherence, the physician was encouraged to liaise with the pharmacy department to initiate an adherence program for them.
Drug Therapy Problems using the Pharmaceutical Care Network Europe (PCNE) Criteria Version 9.0 (dosage too high, Costs of medications too high, unnecessary drug therapy, patients adherence, additional monitoring required, adverse drug effect, need pharmacokinetic monitoring, and drug interaction)[2,15], the physician was notified of any potential or actual drug therapy problem and to either change or retain the medication.
From respondents serum creatinine value, the creatinine clearance was calculated, the physician was also notified either to or not to decrease dosage for medications that may require dosage adjustment or change the medications contraindicated in reduced kidney function.
At the end the level of acceptance of the pharmacist's intervention and the factors affecting physician's acceptance was also recorded in our respondents with type 2 diabetes mellitus.

DEFINITIONS: HDL-C Value (mg/dl): >60 (Considered protective against heart disease), 40-60 (Good), <40 (Risk for heart disease) [16]
LDL-C (mg/dl):<130 (optimal, considered protective), 130-159 (borderline high), ≥160 (high)[16].
FBS (mmol/l): <7.0 (good controlled), >7.0 (poor uncontrolled)
BP (mm/Hg): <140 (controlled), ≥140 (uncontrolled)[16]
eGFR (ml/min/1.73m^2): Stage 1: >90
Stage 2: 60-89
Stage 3a: 45-59
Stage 3b: 30-44

Stage 4: 29-15
Stage 5(ESRD): <15[17]
(eGFR- estimated glomerular filtration rate)
Medication Adherence Questionnaire (MAQ) : <2 (unintentional non-adherence), ≥3 (purposeful non-adherence).[13]

Data analysis

For continuous data points such as age, the mean, median, standard deviation, and range were calculated. For categorical parameters like gender, frequencies were calculated. Data was analyzed using the SPSS version 25.0. The result was expressed in descriptive statistics using chi-square test. P-value < 0.05 was considered as statistically significant.

Ethical consideration

Ethical approval was obtained from the Kwara State's Ministry of Health. Written and oral consents of the respondents were obtained. The Ethical Approval number is **ERC/MOH/2023/08/142.**

RESULTS

Of the 138 respondents, 61.6% (85) were females while 38.4% (53) were males. Age range of 60-69 had the highest response (41, 29.7%). A high percentage lived in the urban region (81, 58.7%), with most of the respondents having tertiary education (58, 42.0%). Majority were low income earners (80, 57.97%). [Table 1]

Table 1: socio demographics of Respondents

Variable	N=138	Frequency (%)
Gender	Female	85 (61.6%)
	Male	53 (38.4%)
Age	20 - 29	3 (2.2%)
	30 - 39	19 (13.8%)
	40 - 49	16 (11.6%)
	50 - 59	40 (29%)
	60 - 69	41 (29.8%)
	70 - 79	16 (11.5%)
	>80	3 (2.2%)
		MEAN AGE: 63
Residence	Urban	81 (58.70%)
	Rural	57 (41.30%)
Highest educational qualification	Non formal	28 (20.3%)
	Primary	16 (11.6%)
	SSCE	36 (26.1%)
	Tertiary	58 (42.0%)
Marital status	Single	16 (11.6%)
	Married	108 (78.3%)
	Widowed	14 (10.1%)
Religion	Islam	71 (51.5%)
	Christianity	67 (48.5%)
	Traditional	0 (0%)
Level of income	Low (<N50,000)	80 (58%)
	Medium (N50,000-N200,000)	50 (36.2%)
	High (>N200,000)	8 (5.8%)

The table 2 indicates that most respondents had desirable HDL-C levels, with 37.0% (51) falling within the good range. Additionally, 68.8% (95) had LDL-C values within the recommended range. Chronic kidney disease (CKD) was identified in 29.7% (41) of participants, while the majority (90.0%) had blood pressure readings below 140 mmHg.

Table 2: Metabolic and Clinical Parameters among Respondents

Metabolic/Clinical parameters	FREQUENCY n= 138	PERCENTAGE (%)
HDL (mg/dL)		
< 40	75	5 4.3
41 - 59	51	37.0
> 60	12	8.7
LDL (mg/dL)		
< 130	95	68.8
130 - 159	36	26.1
≥ 160	7	5.1
Blood Sugar (mmol/L)		
< 7 mmol/l (FBS)	47	34.1
≥ 7 mmol/l (FBS)	43	31.2
< 11.1 mmol/l (RBS)	28	20.3
≥ 11.1 mmol/l (RBS)	20	14.5
eGFR (ml/min/1.73m^2)		
1	23	16.7
2	74	53.6
3 A	23	16.7
3 B	10	7.2
4	8	5.8
5	0	0
Serum creatinine (mg/dL)		
< 1.3 (male)	42	30.4
≥ 1.3 (male)	12	8.8
< 1.1 (female)	66	47.8
≥ 1.1 (female)	18	13.0
Systolic BP (mmHg)		
< 140	124	89.9
≥ 140	14	10.1

High density lipoprotein cholesterol- HDL-C; Low density lipoprotein cholesterol- LDL-C; Fasting blood sugar- FBS; Estimated glomerular filtration rate- eGFR; Blood pressure- BP

The majority of respondents (83.3%, n=115) experienced drug therapy problems (DTPs), with non-adherence being the most common, affecting 66.7% (n=92) of them. Additionally, 42.8% of participants had a moderate cardiovascular disease (CVD) risk score, while 6.5% (n=9) were classified as having a high CVD risk. Among the 319 DTPs identified, non-adherence accounted for the highest proportion (28.8.0%, n=92), followed by potential drug-herbal interactions (17.8%, n=57). [Table 3]

Table 3: **Drug Therapy Problems, Adherence and CVD Risks Score among Respondents**

VARIABLES	**FREQUENCY,N=138**	**PERCENTAGE (%)**
Drug Therapy Problem		
Yes	115	83.3
No	23	16.7
Adherence Score		
<6	92	66.7
>=6	46	33.3
CVD Risk Scores		
<10	70	50.7
>10 - <20	59	42.8
>20	9	6.5
Dyslipidemia		
None	49	35.5
Single	80	58.0
Multiple	9	6.5
Total	138	100
Types of Drug Therapy Problem	***Frequency n=319***	***Percentage (%)***
Dosage too low	9	2.8
Need for additional therapy	70	22.0
Possible Drug-Herbal Medication interaction	57	17.8
Adverse drug reaction	7	2.2
Drug duplication	5	1.6
Need for additional monitoring	74	23.2
Inappropriate drug	5	1.6
Non adherence	92	28.8

Correlation between lipid parameters, eGFR, blood pressure and Cardiovascular disease risks and medication adherence was statistically significant ($p<0.05$). [Table 4]

Table 4: **Correlation between measured metabolic and clinical parameters with the level of adherence among respondents**

Parameters	Medication Adherence Questionnaire (MAQ)		Total (n%)	X^2	P value
	≥3 (n%)	≤2 (n%)			
HDL (mg/dL)				16.28	0.00029
<40	61 (81.3)	14 (18.7)	75 (100)		
41-60	26 (51.0)	25 (49.0)	51 (100)		
>60	5 (41.7)	7 (58.3)	12 (100)		
LDL (mg/dL)				33.42	0.00000
<130	18 (18.9)	77 (81.1)	95 (100)		
130-159	26 (72.2)	10 (27.8)	36 (100)		
≥160	5 (71.2)	2 (28.9)	7 (100)		
Blood Sugar (mmol/L)					
FBS <7	15 (31.9)	32 (68.1)		0.09	0.76537
≥7	28 (65.1)	15 (34.9)			
			47 (100)		
			43 (100)		
RBS <11.1	19	9		0.04	0.83599
≥11.1	13	7 (34.9)			
			28 (100)		
			20 (100)		
eGFR (ml/min/1.73m^2)					
1	10 (43.5)	13 (56.5)	23 (100)		
2	51 (31.1)	23 (68.9)	74 (100)	15.80	0.00744
3A	13 (43.5)	10 (56.5)	23 (100)		
3B	10 (100)	0 (0)	10 (100)		
4	8 (100)	0 (0)	8 (100)		
5	0	0			
			0 (100)		
serum creatinine (mg/dl)				1.01	0.31455
<1.3 (male)	74 (68.5)	34 (31.5)			
<1.1 (female)			108 (100)		
≥1.3 (male)	18 (60)	12 (40)			
≥1.1 (female)			30 (100)		
SYSTOLIC BP (mmHg)				7.79	0.00525
<140	46 (37.1)	78 (62.9)	124 (100)		
≥140	14 (100)	0 (0)			
			14 (100)		
CVD RISK SCORES				10.51	0.00522
Low	32 (52.5)	29 (47.5)	61 (100)		
Moderate	54 (79.4)	14 (20.6)	68 (100)		
High	6 (66.7)	3 (33.3)	9 (100)		

The physician accepted interventions to be instituted in respondents with non-adherence, addition of statins to regimen due to moderate to high CVD risk score was also accepted. Factors affecting their acceptance include interventions were evidence based (3, 100.0%), face to face intervention (3, 100.0%), while intervention due to familiarity was not accepted as a factor that could influence their decision (3, 0.0%). Overall physician acceptance rate of pharmacist's interventions was 100.0%. [Table 5]

Table 5: **Physicians' Acceptance of Pharmacist's Intervention and the Factors That Influence Acceptance**

DTP Observed	Pharmacists Interventions	Physician Acceptance	Frequency255
Non-adherence of medication	Physicians were informed on the non - adherence of medication of their patients and to institute adherence program.	Yes	92
Need for additional drug	*Addition of statins to respondents with moderate-high CVD risk score.	Yes	68
	*Addition of ACEIs and/or diureti cs (loop or potassium sparing) to their medication regimen due to CKD.	Yes	2
Inappropriate drug	*Change Glibenclamide to Gliclazide due to CKD	Yes	5
Need monitoring	*Need to monitor uric acid level due to CKD.	Yes	5
	*Need to monitor LDL and HD L values due to dyslipidemia.		69
Drug duplication	Remove one of the two brands of Hydrochlorothiazide.	Yes	5
Dosage too low	Increase dosage of metformin	Yes	9
FACTORS	Yes	No	
Face to face intervention	100%	0.0%	
Over the phone interventions	100%	0.0%	
Interventions were with evidence	100%	0.0%	
Familiarity with the intervening pharmacist	0%	100.0%	
Confidence in the pharmacist profession	100%	0.0%	

DISCUSSION

Majority of the participants in this study were between the ages 60-69 and studies have shown that T2DM is more prominent in this age group[1,13].A significant proportion of participants (83.3%, n=115) experienced drug-related problems (DRPs), resulting in a total of 319 specific DRPs identified. From these, 225 pharmacist interventions were made.

Chronic Kidney Disease (CKD) has been defined as estimated glomerular filtration rate values of <60 mL/min/1.73m^2 [18]. Using the most recent US National Health and Nutrition Examination Study (NHANES) data from 2007 to 2012, The study found that the total frequency of CKD in individuals with T2DM is 38.3%—11.2% for stage 3a, 5.5% for stage 3b, and 3.1% for stages 4 and 5 combined—which is similar with previously reported data[17]. The NHANES data prior to 2008 found no statistically significant variations in the prevalence of CKD among blacks (33.5-37.5%), whites (34.6-38.2%), or Mexican-Americans (30.2-32.7%)[19]. However according to NHANES data from 2007-2012, Mexican-Americans (43.5%) and blacks (48.8%) had a higher prevalence of CKD than whites (38.7%). In contrast to the present study, which reported an overall CKD prevalence of 29.7%—with 16.7% of respondents in stage 3a, 7.2% in stage 3b, 5.8% in stage 4, and none in stage 5—a hospital-based study by Aliyu et al. (2021) in North-Central Nigeria found a lower prevalence, with only 10.9% of T2DM patients diagnosed with CKD[20]. Physician-accepted interventions in T2DM respondents with CKD in this study included the addition of ACE inhibitors and/or loop or potassium-sparing diuretics, as well as switching from glibenclamide to gliclazide, due to the contraindication of glibenclamide in patients with GFR values below 60 mL/min/1.73 m^2 [21], the need to monitor uric acid levels due to reduced glomerular filtration as higher uric acid levels were associated with an increased risk of renal failure in patients with a lower estimated glomerular filtration rate[22] and instituting adherence program for respondents who were non-adherent to their medication(s).

In T2DM patients CVD is a major cause of morbidity and mortality[23]. The reported CVD prevalence among T2DM patients ranged from 6.9 to 40.8% [24]. The CVD risk score in this study is 49.3%, while in a study in Ethiopia was 42.51%[25]. According to the findings of the Framingham Heart Study, individuals with both diabetes and obesity have a greater lifetime risk of CVD. The lifetime risk of CVD approaches nearly 80% in obese women and nearly 90% in obese men[26]. Interventions made and accepted by the physician(s) in T2DM patients with CVD include addition of statins to T2DM patients with moderate to severe CVD risk score, need to monitor LDL-C and HDL-C values due to dyslipidemia. These findings emphasize the importance of early detection and treatment of this CKD in T2DM, highlighting the importance of tight collaboration between nephrology, primary care[11] and the clinical pharmacists. A study by Artime et al (2021) showed that CVD was also common in individuals with CKD, and the risk rose considerably when urine albumin-to-creatinine ratio (UACR) and eGFR characteristics deteriorated.[18] As seen in this study and a number of other studies have reported that dyslipidemia and the risks of CVD ($p < 0.05$) is higher in patients who are non-adherent to their medication[23,27,28].

In our study the physician acceptance rate of pharmacist intervention was 100%, in contrast to a study in Netherland where the acceptance rate was 71.2%[1]. The difference in the acceptance rate maybe due to the fact that while our study was done face to face, the study in Netherland was done via telephone. Previous studies demonstrated that verbally described interventions are considerably more likely to be accepted than those that are just recorded electronically[1]. Acceptance rate was lower in Lisbon 57.4%[29] and in France acceptance range was over 70%[30,31].

A survey by Zillich and colleagues on physician/pharmacists collaborative working relationship (CWR) show that physicians' practicing in internal medicine, relationship initiation amongst others was found to be a significantly positive relationship driver for physician/pharmacist collaboration[32]. Similar to a study by Osifor et al., 2019 found that elements that affect physician-pharmacists work relationship include poor interpersonal / intergroup communication and limited opportunity for staff interaction[33].

Our study shows that majority 66.7% have their FBS above 7.0mmol/l, it has been established that glycemic management is the most important foundation for addressing T2DM. Although the significance of strict glycemic control in persons with type 1 diabetes mellitus (T1DM) for protection against microvascular complications and CVD is well recognized. Its significance in lowering cardiovascular risk in persons with T2DM has not been demonstrated as thoroughly[18].

As a result, multifactorial risk factor reduction appears to be the most effective approach for macrovascular problems prevention (diet, glycemic control, exercise, smoking

cessation, aggressive blood pressure control, and lipid lowering treatment)[18]. Interventions made an accepted by the physician(s) include upward dosage adjustment of metformin and initiating an adherence program for patients who were not adherent to their medications. In our research, 64.5% of the respondents had dyslipidemia, 83.3% had drug therapy problem and non-adherence was 66.7%. Linden meyer et al. (2006) examined three studies that focused on pharmacist-led integrated management and education initiatives aimed at improving glycemic control in marginalized patient populations all succeeded in reducing glycated haemoglobin (Hb A1c) levels, but it is uncertain whether this was due to increased patient adherence[34]. According to Williams et al. (2014), the heterogeneity in their study designs and adherence measurements made it difficult to discover successful techniques for promoting medication adherence. Furthermore, medication adherence alone may be insufficient to establish glycemic control. Researchers must focus on specific interventions that improve management and outcomes, as well as the need for clear drug adherence measures[35].

CONCLUSION

This study is among the first interventional studies in Nigeria to evaluate physician acceptance of pharmacist-led interventions involving prescription review and clinical risk assessment in patients with type 2 diabetes mellitus. The findings demonstrate that such collaboration is feasible and that pharmacists' input can significantly reduce drug therapy problems and promote safer, more effective medication use.

Physician acceptance rate of pharmacist's interventions was 100.0%. The most common interventions accepted by physicians include addition of statins to respondent's medications due to moderate to high cardiovascular disease risk score, need to monitor lipid profile, and institution of adherence program for respondents who were non-adherent.

LIMITATION

This study high rate of physician acceptance maybe due to the small number of physicians used, the study only focused on T2DM patients and small sample size. A larger sample size of participating physician and study participant maybe needed to decrease the potential bias.

Conflict of interest: The authors declare no conflicts of interests in preparing this research paper

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