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Pharmacist's Knowledge, Attitude, And Practice Towards Type II Diabetes Mellitus Patient in Tabuk City, Saudi Arabia

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Abstract	Original Research Article

Background: Although pharmacists have traditionally been involved in dispensing medications and providing patient counseling, there is mounting evidence that they may improve the clinical and humanistic outcomes for people with diabetes via a variety of supplementary services. The objective of the study is to determine the Knowledge, attitude and practice of pharmacist's in Tabuk, Saudi Arabia about Type II Diabetes Mellitus. **Methods**: This was a cross sectional study conducted at Department of Pharmacy, King Salman Armed forces hospital, Tabuk Kingdom of Saudi Arabia. A total of 110 study participants were included in the study. Data was collected with the help of a predesigned questionnaire containing closed ended questions regarding knowledge, attitude and practice of pharmacists toward type II diabetic patients care. Data entry and analysis was done with the help of SPSS version 25. **Results:** In this study 69.10% of the pharmacists were strongly agree/agree on their prominent role in diabetic patient care. About 77.30% pharmacists were strongly agree/agree for the fact that prescribing physicians are the only professionals who need to understand and 86.40% were strongly agree/agree that pharmacist role can improve diabetic patient care. Among pharmacists 60% were strongly agree/agree for that fact that their role can minimize the medications related complaints. Attitude and practice towards medicine dispensing and related aspect of dispensing were aligned to the standard protocols in their hospital. i.e. screening of prescription, collaboration and communication with health professional/prescriber, education of the patients, participating in workshops related to diabetic patient care and counseling of patients. **Conclusion**: Results of this study demonstrate that pharmacists had good knowledge, attitude and practice towards their basic dispensing role for type II diabetic patients. But they were full aware of their extended role which can be helpful for the patients for better management and control for their good health outcome and to manage their health more efficiently.
Keywords: Diabetes Mellitus, Pharmacist, Tabuk, Knowledge, Attitude, Practice.

INTRODUCTION

Among the many global pandemics, Type 2 Diabetes Mellitus (T2DM) is particularly dangerous because it poses a severe public health emergency that cuts across both geographic and demographic lines. Its prevalence has surged to previously unheard-of levels, impacting millions of people globally. The causes of this pandemic are deeply ingrained in modern lifestyle shifts, with rising obesity rates, unhealthy eating patterns, and sedentary behaviors serving as the main triggers. The prevalence of type 2 diabetes is greatly influenced by larger, non-individual factors such as genetic predisposition, fast urbanization, and an ageing world population [1].

Public health officials in Saudi Arabia are understandably worried about the dramatic rise in the incidence of type 2 diabetes mellitus (T2DM). The Kingdom of Saudi Arabia faces a significant public health risk due to its second-highest diabetes incidence in the Middle East and seventh-highest prevalence globally, according to the World Health Organization. Over 3 million Saudi Arabians struggle with pre-diabetic conditions, and an estimated 7 million have diabetes, underscoring the pressing need for treatment [2]. Notably, during the previous 20 years, the costs of diabetes-related healthcare and treatment have increased by more than 500%. The health care budget in 2014 was 180 billion Saudi Riyals, of which 17 billion were allocated to the Saudi population as a whole, and

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281

approximately 25 billion to the country's diabetic population. This suggests that Saudi Arabia's overall health spending accounts for approximately 13.9% of the direct costs associated with diabetes [3].

Against the backdrop of an increasing prevalence of T2DM, this study intends to thoroughly investigate the perspectives, knowledge, and interactions of Saudi Arabian pharmacists with Type II Diabetes Mellitus (T2DM) [4]. Given the critical role that pharmacists play in healthcare, especially with regard to chronic conditions, this study intends to shed light on pharmacist's attitudes regarding type 2 diabetes, evaluate their knowledge of the illness, and investigate their actual interactions with T2DM patients. The pharmacist can actively participate in the management of the DM medication and its related complications by providing the best possible drug treatment. To ensure that their elderly patients fully comprehend their condition and course of treatment and achieve successful clinical outcomes, chemists can also employ the patient education approach [5]. It is imperative to enable patients to take charge of their own care, working in tandem with medical professionals to self-manage their illness. Although a pharmacist's traditional responsibilities have primarily involved dispensing medications and providing patient counselling, there is mounting evidence that pharmacists can improve the clinical and humanistic outcomes of diabetic patients by offering a variety of additional services [6]. By identifying these factors, the research hopes to guide focused interventions, advance professional growth, and eventually raise the standard of diabetes care in Saudi Arabia [7-9]. The objective of the study is to determine the Knowledge, attitude and practice of pharmacist's in Tabuk, Saudi Arabia about Type II Diabetes Mellitus.

METHODS

Ethical approval was taken from Hospital research ethics committee. (KACST-No: HO-07-TU-002, Date: 12 November, 2023). After obtaining ethical approval the study was started. This was a cross sectional study conducted at Department of Pharmacy, King Salman Armed forces hospital, Tabuk Kingdom of Saudi Arabia. Study was completed in 2 months time duration (Octover-2023 till November-2023). Sample selection was done with the help of predefined inclusion and exclusion criteria. Inclusion criteria for the study participants was All pharmacist's technician or specialist working in King Salman armed forces hospital (KSAFH) aged 20-60 years either gender with any nationality and willing to participant in the study were included in this study. Participants other than pharmacists working in the pharmacy department were excluded from the study. Sample selection was done with the help of non-probability purposive sampling technique. Sample size calculation was done with the following parameters. i.e. Sample size of 110 participants was calculated with 90% confidence level, 8% margin of error and by taking expected percentage of adequate knowledge about type-

II Diabetes mellitus among the pharmacists respectively. Sample size calculation was done on the WHO calculator (Sample size determination in health studies). Verbal and written informed consent was obtained from all study participants and they were assured that their personal information and feedback was kept confidential and was not shared with anyone and was only used for this research purpose. The existing literature on the subject was considered when designing the questionnaire. There were a total of 27 questions broken down into three categories: age, gender, education, work experience, and job status (the first five questions), knowledge assessment (the next eight questions), and attitude and practice (the last fourteen questions). All these questions were close ended questions having multiple choices. All data collectors were trained on Arabization of the questions in a workshop designed for this purpose to avoid variation in data collection. A pilot study was done among 25 participants who were not included in this stud to assess whether the questionnaire items were clear, understandable, relevant and valid.

Data Analysis

All the questionnaire were checked for the completeness. Questionnaire with complete filled information were included in the final analysis. Coding scheme for each variable was defined before data entry. Data entry and analysis was done with the help of SPSS version 25. Quantitative variables were presented with mean±SD and qualitative variables were presented with frequency and percentage. To see the association between qualitative variables Chi-Square test/ Fisher exact test was applied. Statistical significance criteria was set as p-value ≤ 0.05.

RESULTS

In this study the most frequency age group was 20-30 years (41.8%) followed by 41-50 years (31.8%) and 31-40 years (26.4%) respectively. Among study participants 80(72.7%) were male and 30(27.3%) were female. Educational status showed that 68(61.8%) had bachelors degree, 39(35.5%) had masters degree and 3(2.7%) participants were PhD. Job status of participants showed that 45(40.9%) were clinical pharmacists, 19(17.3%) were community pharmacists and 46(41.8%) were hospital pharmacists. Job experience showed that 46(41.8%) participants experience was 1-4 years, 40(36.4%) participants had 5-9 years experience and 24(21.8%) participants had >10 years. Table-1 describes the pharmacist knowledge on their role on type-2 diabetes mellitus. Table-2 describes the attitude and practice towards type-2 diabetes mellitus patients.

DISCUSSION

So far, there have been excellent clinical, humanistic, and economic outcomes from pharmacist interventions aimed at improving diabetes treatment, especially for type 2 diabetics [10]. Pharmacists' contributions to diabetes treatment should extend beyond only dispensing medicine; they should also provide

cognitive services to help people with diabetes self-manage their condition and get the greatest potential clinical results [10].

Pharmacists working in community pharmacies in Saudi Arabia do not yet have access to any kind of organized CPD program from either pharmacy schools or other healthcare groups [11, 12]. To better serve their patients, community pharmacists in Saudi Arabia are looking into training and education programs that would teach them how to run clinics under the supervision of pharmacists and provide specialized care [11].

According to a new Saudi Arabian research, professional pharmacy organizations should provide a planned diabetes education program that is all-encompassing, standardized, and well-organized. By participating in these courses, community pharmacists may increase their clinical competence, which in turn would allow them to better care for and monitor patients with diabetes in pharmacist-led diabetes clinic [13]. Research shows that pharmacists have little understanding of diabetes care [14]. One possible explanation for the low level of knowledge is that community pharmacists do not receive enough long-term training and education on the management of chronic diseases, such as diabetes mellitus (DM), which would enhance their knowledge and practice in this area.

In this 64.55% pharmacists were agreeing that they collaborate with other health professionals for DM type 2 patient care. Similar findings were reported in a Malaysian study in which 69.6% of the pharmacists reported that they interact with other health care professionals to resolve patients problems [15]. In this study 37.27% pharmacists reported that they always educated their patients regarding the use of their diabetes medicine and related issues to these medications. Study participants with type 2 diabetes mellitus showed substantial improvements in illness awareness and medication adherence after participating in a home-based intervention guided by a pharmacist [16]. In this study 60% of the pharmacists reported that they always and often try to prevent/reduce their patients complaints regarding their diabetic medications.

In this study it was reported that 29.09% of the pharmacist always advised their patients to change their life style for better improvement with their medications. Weight management, healthy eating, and regular exercise were often or always emphasized to patients by the majority of pharmacists [17]. Nutritional therapy and physical exercise are cornerstones of diabetes care, and these results are encouraging since they help patients achieve better glucose control [18, 19].

In this study 26.36% pharmacists reported that they always spent >5 minutes in patients counseling for their medications. According to research out of Kuwait, pharmacists often advised their patients on when to take their drugs [20]. Management of drug treatment, medication reconciliation, screening, vaccination, and other preventive care services, education, and behavioral counseling are just a few of the numerous services that pharmacists may provide.

Educating patients on how to effectively self-manage their diabetes is another service that clinical pharmacists may provide, in addition to prescription management. This allows the responder to establish objectives for illness management, which the clinical pharmacists achieve via motivational interviews. There has been encouraging evidence that self-management assistance may help reduce diabetic complications. Thanks to the proliferation of digital technology, patients may now easily upload important medical records to get pharmacist advice. Patients who have trouble getting to their primary care provider might be monitored remotely by healthcare professionals. Furthermore, patients may readily access instructional events hosted by the clinical pharmacist [21]. Medicine counseling and other patient-centered care services are provided by community pharmacists in Saudi Arabia; nonetheless, there is a great need for development in these areas [11].

CONCLUSION
Results of this study demonstrate that pharmacists had good knowledge, attitude and practice towards their basic dispensing role for type II diabetic patients. But they were fully aware of their extended role which can be helpful for the patients for better management and control for their good health outcome and to manage their health more efficiently.

Table 1: Pharmacists knowledge on their role on Type 2 diabetes Mellitus (T2DM)

Questions	Options	n	%
Responsibility to take prominent role in T2DM patient care	Strongly agree	36	32.70%
	Agree	40	36.40%
	Neutral	20	18.20%
	Disagree	2	1.80%
	Strongly disagree	12	10.90%
Prescribing physicians are the only professionals who need to understand T2DM patient care	Strongly agree	50	45.50%
	Agree	35	31.80%
	Neutral	15	13.60%
	Disagree	1	0.90%

Questions	Options	n	%
	Strongly disagree	9	8.20%
Adequate training should be provided to pharmacists on T2DM patient care	Strongly agree	45	40.90%
	Agree	46	41.80%
	Neutral	19	17.30%
Pharmacist role in DM type 2 improve patient care	Strongly agree	41	37.30%
	Agree	54	49.10%
	Neutral	15	13.60%
Educational activities for pharmacists to enhance understanding for T2DM	Strongly agree	57	51.80%
	Agree	36	32.70%
	Neutral	17	15.50%
Pharmacist role in DM type 2 dispensing medications reduce patient complains	Strongly agree	31	28.20%
	Agree	35	31.80%
	Neutral	32	29.10%
	Disagree	5	4.50%
	Strongly Disagree	7	6.40%
Key health care professionals to move us toward achieving better medication therapy outcomes	Strongly agree	74	67.30%
	Agree	23	20.90%
	Neutral	7	6.40%
	Disagree	2	1.80%
	Strongly Disagree	4	3.6%
Serve as a resource to other health care providers and payers to assure safe, appropriate, cost-effective medication use	Strongly agree	47	42.70%
	Agree	31	28.20%
	Neutral	19	17.30%
	Disagree	9	8.20%
	Strongly disagree	4	3.60%

Table 2: Pharmacists Attitude & Practice towards Type 2 diabetes Mellitus patients

Questions	Options	n	%
I dispense DM prescription with complete clinical information	Always	36	32.73%
	Often	39	35.45%
	Rarely	35	31.82%
I dispense anti diabetic medications without prescription	Rarely	12	10.91%
	Never	98	89.09%
I screen the diabetic prescription accordance with local guidelines before dispensing	Always	37	33.64%
	Often	40	36.36%
	Rarely	33	30.00%
I collaborate with other health professionals for DM type 2 patient care	Always	44	40.00%
	Often	27	24.55%
	Rarely	39	35.45%
I communicate with prescriber if am unsure about the appropriateness of diabetic medications	Always	33	30.00%
	Often	36	32.73%
	Rarely	41	37.27%
I sought additional clinical information	Always	41	37.27%
	Often	31	28.18%
	Rarely	38	34.55%
I educate patient on the use of anti -diabetic medication and related issues	Always	41	37.27%
	Often	40	36.36%
	Rarely	29	26.36%
I make efforts to prevent or reduce the patient complains regard the diabetic medications	Always	26	23.64%
	Often	40	36.36%
	Rarely	44	40.00%
I take part in diabetic workshops, diabetic counselling day to promote the optimal use of diabetic medications	Always	41	37.27%
	Often	38	34.55%
	Rarely	31	28.18%
I contact the prescriber if the medication is not available to give alternatives	Always	38	34.55%
	Often	40	36.36%
	Rarely	32	29.09%

Questions	Options	n	%
I advise the patient to change his life style (diet and exercise) for better improvement with the medications	Always	32	29.09%
	Often	37	33.64%
	Rarely	41	37.27%
I share all update clinical information for diabetic medication with my colleague	Often	37	33.64%
	Rarely	32	29.09%
	Never	41	37.27%
I use resources of drug information that available in the pharmacy like BNF, medical journals and med line data base	Often	41	37.27%
	Rarely	31	28.18%
	Never	38	34.55%
I spend more than 5 minutes in patient counselling for diabetic medications	Always	29	26.36%
	Often	26	23.64%
	Rarely	25	22.73%
	Never	30	27.27%

Table 3: Association of Pharmacist Knowledge, Attitude and Practice with Age, experience and Job status

Questions	Age	Experience	Job
Responsibility to take prominent role in T2DM patient care	0.557	0.396	0.184
Prescribing physicians are the only professionals who need to understand T2DM patient care	0.099	0.168	0.364
Adequate training should be provided to pharmacists on T2DM patient care	0.370	0.467	0.007*
Pharmacist role in DM type 2 improve patient care	0.401	0.280	0.044*
Educational activities for pharmacists to enhance understanding for T2DM	0.580	0.920	0.670
Pharmacist role in DM type 2 dispensing medications reduce patient complains	0.689	0.604	0.625
Health care professionals to move us toward achieving better medication therapy outcomes	0.603	0.298	0.672
Serve as a resource to other health care providers and payers to assure safe, appropriate, cost-effective medication use	0.181	0.491	0.134
I dispense DM prescription with complete clinical information	0.412	0.361	0.896
I dispense anti diabetic medications without prescription	0.488	0.486	0.469
I screen the diabetic prescription accordance with local guidelines before dispensing	0.336	0.196	0.707
I collaborate with other health professionals for DM type 2 patient care	0.160	0.774	0.320
I communicate with prescriber if am unsure about the appropriateness of diabetic medications	0.078	0.201	0.213
I sought additional clinical information	0.548	0.735	0.844
I educate patient on the use of anti -diabetic medication and related issues	0.738	0.853	0.622
I make efforts to prevent or reduce the patient complains regard the diabetic medications	0.949	0.988	0.808
I take part in diabetic workshops, diabetic counselling day to promote the optimal use of diabetic medications	0.982	0.636	0.561
I contact the prescriber if the medication is not available to give alternatives	0.710	0.627	0.198
I advise the patient to change his life style (diet and exercise) for better improvement with the medications	0.454	0.175	0.128
I share all update clinical information for diabetic medication with my colleague	0.707	0.782	0.652
I use resources of drug information that available in the pharmacy like BNF, medical journals and med line data base	0.657	0.797	0.311
I spend more than 5 minutes in patient counselling for diabetic medications	0.379	0.032*	0.36

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