

Evaluating The Knowledge and Attitude of Community Pharmacists Toward Type II Diabetes in Lusaka, Zambia.

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ABSTRACT

Background:- This study is hinged on the basis that in addition to knowledge updates, the attitudes of health care professionals toward current concepts about diabetes care are even more critical. The core philosophy of modern diabetes care puts emphasis on patient autonomy and optimal utilization of health care professionals' different specialties. This study was undertaken to evaluate the knowledge and attitude of community pharmacists toward diabetes care.

Materials/Methods :- Eighty four conveniently selected community pharmacists were surveyed by the Diabetes knowledge Test (DKT) and Diabetes Attitude Survey (DAS) questionnaires. The Diabetes Knowledge Test evaluated the pharmacists' diabetes knowledge based on a validated 23 item questionnaire, the Michigan Diabetes Knowledge Test (MDKT). The Attitude Survey involved the likert scale to determine the community pharmacist's perceptions about the seriousness of type II diabetes, psychological impact of the disease, patient autonomy, need for special training in diabetes and finally the value of tight glucose control in type II diabetes.

Results:- The results showed the mean Diabetes Knowledge Test's overall score being 13.77/23(59.86%). General diabetes information score was 8.96/15(59.3%) and for Insulin Therapy-specific questions was 4.84/8(60.5%). The mean Attitude Survey's overall score on the likert scale was 3.04. Amongst the subscales of the Attitude Survey, the score on the need for special training was the highest (3.28) and the score on the subscale for patient autonomy was the least (2.88). This in general showed unacceptable level of knowledge and a bias of attitude towards neutral (neither positive nor negative). There was no association between knowledge and attitude of community pharmacists involved in the study. Some statistical difference was noted in respondents levels of knowledge based on their differences in ethnicity (race), practice setting (other than community pharmacy) and level of education that is, in addition to the basic degree(bachelor of pharmacy).

Conclusion :- The study has revealed with consideration of all its possible limitations and strengths that the levels of knowledge and attitude of community pharmacists in Lusaka are unacceptable. The attitude of community pharmacists equally leaves much to be desired as it displayed a lot of indecision with its tendency toward the neutral, meaning that the patient's expected desirable outcome could not have a guarantee for optimisation as far as pharmaceutical care towards type II diabetes is concerned.

Key words

Diabetes- Diabetes mellitus (DM) is a chronic, progressive, systemic disease characterized by dysfunction in metabolism of fats, carbohydrates, protein, and insulin with subsequent impairment of blood vessels and nerves (1).

Knowledge -The appropriate evidence based standard pharmaceutical skills, abilities and understanding that community pharmacists have on type II diabetes.

Attitude-A predisposition or a tendency to respond positively or negatively towards a certain idea, object, person, or situation, in this case pertaining to type II diabetes with regards to community pharmacists . **Likert Scale** - Was used for rating the questionnaire(attitude survey questionnaire) response

Community pharmacist-A community pharmacist is responsible for controlling, dispensing and distributing medicine. They work to legal and ethical guidelines to ensure the correct and safe supply of medical products to the general public.

List of abbreviations

- i. TYPE II DIABETES - Type Two Diabetes
- ii. TYPE 2 DIABETES - Type Two Diabetes

- iii. DKT - Diabetes Knowledge Test
- iv. DAS - Diabetes Attitude Survey/ Diabetes Attitude Scale
- v. DM - Diabetes Mellitus
- vi. DSM - Disease State Management
- vii. MDRTC - Michigan Diabetes Research and Training Centre
- viii. ZMRA - Zambia Medicines Regulatory Authority

I. INTRODUCTION/BACKGROUND

Diabetes mellitus (DM) is a chronic, progressive, systemic disease characterized by dysfunction in metabolism of fats, carbohydrates, protein, and insulin with subsequent impairment of blood vessels and nerves (2). The practice of diabetes care has dramatically changed during the past two decades. Knowledge regarding diabetes pathophysiology has quickly accumulated and has led to the development of new medications. In addition to knowledge updates, the attitudes of health care professionals toward current concepts about diabetes care are even more critical. The core philosophy of modern diabetes care puts emphasis on patient autonomy and optimal utilization of health care professionals' different specialties. Research evidence derived from clinical, economic, and humanistic outcomes also strongly supports the importance of patient autonomy and a team approach to diabetes care. Pharmacists' knowledge and attitudes toward diabetes can significantly influence patient outcomes (3). Pharmaceutical care which to some extent embraces knowledge and attitude of a pharmacist has significantly reduced the occurrence of drug-related problems and fulfilled the desired outcomes of drug therapy in other diseases and conditions such as anticoagulation, hyperlipidemia, and asthma (4). Studies have also shown that pharmacists' participation in the care of poorly controlled diabetic patients resulted in better outcomes (4).

This study is focused on the attitude and knowledge of community pharmacists on type II diabetes which also received special mention in the WHO adherence report (5). Type II diabetes is a disease of pandemic proportions increasingly making its presence felt in the developing world where, it is predicted, most of the world's diabetes burden will in future be borne (6). Furthermore, it is a disease where pharmacotherapy and lifestyle modification play major roles in the treatment and management of the condition, (7) and where health promoting interventions in both these therapeutic areas are accommodated within the pharmacist's defined scope of practice (8)(9)(10).

Most, if not all, Type II diabetes patients make use of long-term pharmacotherapy to manage their disease. The prescription refill dynamic provides for frequent personal and informed contact between the patient and the pharmacist and thus positions the community pharmacist for roles in diabetes care beyond the traditional medicine-dispensing role (9)(10). Encounters of this nature present pharmacists with ideal opportunities to provide pharmaceutical care across a range of chronic diseases. The concept of expanding the pharmacist's role to include patient care was first voiced by Hepler and Strand, (11) who defined pharmaceutical care as "the responsible provision of drug therapy for the purpose of achieving definite outcomes that improve a patient's quality of life." Pharmaceutical care includes providing services such as monitoring, documenting, and reporting patient adherence, drug therapy outcomes, and drug related problems in the context of a continuum of care from patient assessment through monitoring and follow-up. Since patients with diabetes suffer from a chronic disease requiring lifelong attention, they are well suited to receive Pharmaceutical care services (PCS). Few well-designed studies have evaluated the outcomes of PCS. Fewer have evaluated PCS in community pharmacies, and even fewer have focused on diabetes-related PCS in the community pharmacy setting. Most existing reports provide only a before and after assessment of services, and many are assessments of pilot studies rather than ongoing programs (12). In Zambia, such data does not exist currently. Despite support for the notion that amount of knowledge is associated with attitude-behavior consistency, there are some limitations in the available research. One limitation is that in attitude-behavior consistency research, knowledge has always been measured rather than experimentally manipulated. Thus, it is difficult to decompose knowledge effects from other variables with which this construct is correlated, such as attitude certainty, extremity, and accessibility (13)(14). Therefore, there is no definitive evidence that knowledge per se exerts a causal influence on attitude-behavior consistency. In this regard, included in my specific objectives will be to determine any association between the two concepts without regard to a causal relationship.

II. MATERIALS/METHODS

This was a descriptive cross-sectional study. The aim of this study was to determine the attitude and knowledge of community pharmacists towards type II diabetes in Lusaka, Zambia. This study was designed to identify the knowledge that pharmacists routinely provided to people with diabetes and their attitudes towards the disease. Data was captured using the diabetes attitude survey and diabetes knowledge test questionnaires. The demographic characteristics were also collected using the demographic data tool. Data consisted of variables comprising demographic characteristics, Levels of Knowledge and the Attitude (perception) of respondents on

type II diabetes. All the variables were categorical (Nominal or Ordinal) in nature. The Statistical Package for Social Sciences (SPSS) version 16 was used for analysis of both Descriptive and Inferential statistics.

The setting for this study was Lusaka. All the 77 registered Community Pharmacies in Lusaka were selected where Pharmacists in those particular pharmacies were identified and formed part of the required study population. The study involved interviews through Questionnaires of the pharmacist practicing in that particular pharmacy. All participating pharmacists had to provide informed consent before engaging them in the study.

The study population was the practicing pharmacist/s in any particular community pharmacy at the time of the study. Community pharmacists were conveniently sampled to be engaged in the study. All community pharmacists that attended to patients in that particular pharmacy were involved in the study.

III. RESULTS

Level of knowledge of community pharmacists toward type II diabetes

Table 1 below details the scores of community pharmacists on the knowledge test. The respondents were subjected to the Diabetes Knowledge Test (DKT) which comprised the General test and Insulin use test. The average score out of 23 questions was 13.77 (59.87%) for the overall Knowledge Test (General test plus Insulin therapy test). Out of the 15 questions, a mean score of 8.96 (59.33%) was recorded in the General Test. The respondents scored an average of 4.85 (60.6%) on the Insulin use Test. The maximum score in the overall knowledge test (a combination of general diabetes test and insulin use test) was 23 (100%) out of 23 questions and the minimum score was 7 (30.4%) out of the 23 questions.

Knowledge scores were classified as follows: (1) Acceptable was any knowledge score above 74%, (2) Partially Acceptable was any knowledge score 60-74% and (3) Unacceptable was less than 60%. In short, Acceptable = > 74%, Partially Acceptable = 60-74%, Unacceptable = < 60%.

Table1: Scores on the diabetes knowledge test

	iN	Minimum score	Maximum score	² Mean(%) score	SD
Overall Knowledge	23	7.00	23.00	13.7(59.8)	3.22771
General Test	15	4.00	15.00	8.9(59.3)	2.21955
Insulin Use	8	1.00	8.00	4.8(60.6)	1.61688

Likert Scale Values and corresponding frequencies of community pharmacists extent of beliefs on different Attitude Subscales.

The five sub-units comprising the Diabetes Attitude Scale showed a diverse of scores on a Likert Scale as shown in Table 5 below. It is noticeable that none of the respondents either strongly disagreed or strongly agreed with the general statement on the Attitude towards the diabetic Patient's Autonomy on management of the disease. The general trend on the likert scale is a bias towards 3 (Neutral) as shown in table 10 below. Both the extreme ends of the likert scale i.e. 1 (Strongly Disagree) and 5 (Strongly Agree) had the least scores generally. The score of 1 which represents a stronger disagreement against the general statement on the Attitude of Community Pharmacists on type II Diabetes had the highest number of respondents on the Need for Special Training a subunit of the Attitude Scale. The score of 3 (Neutral) had relatively a higher number of respondents compared to all other scores on the Likert Scale.

Table 2: Likert Scale Values and corresponding frequencies of community pharmacists extent of beliefs on different Attitude Subscales

Likert Scale response	Attitude Subscales					Total
	³ SpTr	⁴ ST2D	⁵ VTGC	⁶ Psyl	⁷ PA	

¹Number of questions in that particular test

²Mean score is an average score of all community pharmacists involved in that particular study

³Attitude of community pharmacists toward the need for special training in type II diabetes

⁴Attitude of community pharmacists toward the seriousness of type II diabetes

⁵Attitude of community pharmacists toward the psychological impact of type II diabetes

⁶Attitude of community pharmacists toward the value of tight glucose control in type II diabetes

⁷Attitude of community pharmacists toward the need for special patient autonomy in type II diabetes

Strongly Disagree	1	9	3	2	14
Disagree	2	9	25	29	109
Neutral	3	27	30	31	163
Agree	4	27	18	20	110
Strongly Agree	5	12	8	4	24
Total		84	84	84	420
Average Likert Scale Value		8 ^{3.04}			

The association between different races of community pharmacists with their level of Knowledge on type II diabetes

Table 3 reports the knowledge pattern among the three races showing 6(8%) of Africans, 5(38.46%) of Asians and 1(50%) of the mixed having acceptable levels of knowledge on type II diabetes. Most African community pharmacists 37(53.62%) had unacceptable levels of knowledge on type II Diabetes. There was a statistical difference in the levels of knowledge among different races of Community pharmacists ($\chi^2 = 10.911$, $p = 0.028$, using chi-square test).

Table 3: The effect of different races of community pharmacists on their levels of knowledge towards type II diabetes

Race	Levels of Knowledge			Total
	10 ^{Acceptable}	11 ^{Partially Acceptable}	12 ^{Unacceptable}	
African	6	26	37	69
Asian	5	3	5	13
Mixed	1	1	0	2
13 ^{Total}	12	30	42	84

IV. DISCUSSION

Level of knowledge of community pharmacists toward type II diabetes

In this study, the level of knowledge of community pharmacists toward type II diabetes was unacceptable (59.8%) and the scores in the general diabetes test and insulin use test were unacceptable (38.95%) and partially acceptable (60.6%) respectively. Though these results on knowledge of community pharmacists towards type II diabetes cannot be inferentially generalised to all pharmacists in the country, they still give a baseline idea that education in diabetes has to be scaled up especially on community pharmacists since they are in a unique position to enhance desirable outcomes in patients with this chronic condition who are ever visiting community pharmacies for refills. The lack of knowledge could be attributed to unavailability of continuing education programmes in diabetes care that could foster efficient interventions by community pharmacists in terms of adequate pharmaceutical care for the patients. The other main reason for these unacceptable results could be due to lack of deliberate policy by the policy makers (Ministry of Health) to engage community pharmacists as custodians of pharmaceutical care for diabetics, an exercise which would ultimately improve the quality of life of type II diabetics in our communities.

Attitude of community pharmacists towards type II diabetes

Our results indicate that the average likert scale value for the respondent's attitude towards type II diabetes was 3.04. This is a neutral value meaning even when a positive attitude was supposed to be shown towards the patient, the pharmacist did not. This lack of positive thrust on attitude of community pharmacists towards type II diabetes would lead to a number of deleterious effects on the patient. One of the major ones could be poor compliance with medication by patients since it might deprive them of the much needed motivation especially that type II diabetes is a chronic condition that is debilitating thus therapy is of life-long

⁸The attitude or perception of community pharmacists toward the five subscales of the attitude scale was on average neutral(3.04).

⁹Overall level of knowledge in both the general diabetes and insulin therapy tests

¹⁰Any average score above 74%

¹¹Any average score ranging from 60-70%

¹²Any average score less than 60%

¹³Total number of community pharmacists at each level of knowledge

setting. This would ultimately lead to poor outcomes. This poor attitude could be due to a number of factors some of which may be: 1. Lack of knowledge (though this study showed no relation between knowledge and attitude). 2. Lack of motivation on part of pharmacists due to number of factors 3. Poor practice settings (environment) 4. Very low number of Pharmacist to patient ratio (patient overload) and very long working hours.

The association between different races of community pharmacists with their level of Knowledge on type II diabetes

In this study we have shown that considering the associations between levels of knowledge and demographic variables of community pharmacists, there was a statistically significant difference between the race of community pharmacists with their level of knowledge($\chi^2 = 10.911$, $p = 0.028$, using chi-square).The reason for this cannot be immediately known and it is worth undertaking another study to establish the cause.

Similar studies done

In this study we have found that comparably, similar research has been done in sub-Saharan Africa which includes Libya, Nigeria and South Africa. Other countries where similar research has been undertaken include Taiwan, USA, Bulgaria and Brazil. In Nigeria(15) at University of Maiduguri Teaching Hospital 65.5% of respondents(Pharmacists) had satisfactory / acceptable knowledge about pharmaceutical care ($\chi^2 = 71.32$; $p = 0.00$; $df = 2$) towards diabetes mellitus as compared to 14.28%(12 out of 84) respondents in Zambia ($\chi^2 = 3.986$, $p = 0.136$).Ninety Six percent (96.6%) had positive attitude towards pharmaceutical care for diabetes mellitus patients based on interest to know more and seeing the need and willingness to incorporate pharmaceutical care into practice ($\chi^2 = 172.98$; $p = 0.00$; $df = 1$) as compared to 31.91% in community pharmacies in Lusaka, Zambia.In Libya(16) only the knowledge of community pharmacists was assessed and the mean overall Knowledge score was 16/23(69.56%) compared to 13.77/23(59.87%) in this similar study in Zambia. In Libya the General diabetes information score was 9/15(60%) and for insulin therapy-specific questions was 7/8(87.5%) respectively compared to 8.96/15(59.7%) and 4.84/8(60.5%) respectively in this study in Lusaka, Zambia.Looking at the above very similar studies done in Nigeria and Libya, a visible discrepancy of their results compared to those in this particular study can be noticed. To be specific, the levels of knowledge in this study are relatively lower compared to both Libya and Nigeria and the Attitude towards type 2 diabetes is more on the neutral side as compared to the positive attitude towards type 2 diabetes of pharmacists engaged in the study in Nigeria. The study in Nigeria looked at pharmacists confined to the hospital set up where as this study focused on community pharmacists only, the differences in environment which might include availability and accessibility to literature on type II diabetes might have some effects on their differences in terms of exposure to knowledge concerning type II diabetes and it invokes a thought as to whether this difference in knowledge might be contributing to the differences in their attitude. But in this study in Zambia there was however no relationship between knowledge and attitude ($\chi^2 = 5.642$, $p = 0.467$).

In short, this inconsistency with the results of other researchers could have been due to the different subject pool used in this research and also a slightly different procedure used in this research could have contributed to the discrepancy noticed. And in the analysis of the data, the test material could have changed in some way and all these could have had an effect on my results. These effects of discrepancies and variations are in some way an appreciation for the limitations of my study which include, a relatively smaller subject pool of 84 community pharmacists.

V. CONCLUSION

The findings of this study empower one to conclude that the levels of knowledge of community pharmacists towards type II diabetes in Lusaka Zambia is on average unacceptable(59.8%). The attitude of community pharmacists towards type II diabetes on likert scale was on average neutral(3.04) lacking the expected positive thrust.

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REFERENCES

- [1] Yarborough. Diabetes Mellitus. [book auth.] Alan H, Mutnick, Paul F, Souney, Larry N, Swanson Shargel L. Comprehensive Pharmacy Review. Baltimore : Lippincott Williams and Wilkins, 2007.
- [2] Ayesha M, Kaushik R. Diabetes the hidden pandemic and its impact on sabsaharan africa. Johannesburg : Diabetes leadreship forum, 2010.
- [3] Hsiang-Yin, Tzung-Yi Lee b, Wan-Tsui Huang b and Chang c Short Term impact of continuing education on Pharmacist's Knowledge and Attitude towards type 2 diabetes: American Journal of Pharmaceutical Education, 2004, Vol. 68.
- [4] Jungnickel PW and Wischart DA. Evaluation of community pharmacists' experiences with cholesterol screening programs.. 1997, J Am Pharm Assoc, Vols. 640-6., p. NS 37.
- [5] WHO. Adherence to long-term therapies: evidence for action. 2003.
- [6] King H, Aubert R and Herman W. Global burden of diabetes, 1995-2025: prevalence,.. 9, 1998, Diabetes Care , Vol. 21, pp. 1414-1431.
- [7] Chitre MM and Burke S. Treatment Algorithms and the Pharmacological Management of Type 2 Diabetes. 4, 2006, Diabetes Spectr , Vol. 19, pp. 249-255.
- [8] Wermeille J, Bennie M, Brown I and McKnight J. Pharmaceutical care model for patients with type 2 diabetes: integration of the community pharmacist into the diabetes team-a.. 1, 2004, Pharm World Sci , Vol. 26, pp. 18-25.
- [9] Kiel PJ and McCord AD. Pharmacist Impact on Clinical Outcomes in a Diabetes Disease Management Program via Collaborative Practice.. 11, 2005, Ann Pharmacother , Vol. 39, pp. 1828-1832.
- [10] Johnson LC and Beach E. The importance of the pharmacist's expanding role on diabetes team: reinforcing nutritional guidelines for improved glycemic control.. 3, 1997, Pharm Pract Manag Q, Vol. 17, pp. 32-44.
- [11] Hepler CD and Strand LM. Opportunities and responsibilities in pharmaceutical care. s.l. : Am J Hosp Pharm, 1990.
- [12] Christensen, Carole W. Cranor and Dale B. The Asheville Project: Short term Short-Term Outcomes of diabetes care in community pharmacy. s.l. : J Am Pharm Assoc, 2003.
- [13] Bassili and J. N. Meta-judgmental versus operative indexes of psychological attributes: The case of measuring attitude strength.. 1996, Journal of personality and social psychology, Vol. 71, pp. 637-653.
- [14] Boninger, D. S., Krosnick, J. A., Berent and M. K. The causes of attitude importance: Self-interest, social identification, and values.. (1995). 1995, journal of personality and social psychology, Vol. 68, pp. 61-80.
- [15] Sa'ab, Giwa, Yakubu, Giwa, Abubakar and Ajiboye. Pharmacists' Knowledge, Attitude and Practice of Pharmaceutical Care for Diabetes Mellitus Patients in a Teaching Hospital.. 2., 2013, International Journal of Pharmacy Teaching & Practices, Vol. 4, pp. 607-612.
- [16] Bisheya, El-Mijbri, Beshyah and Ibrahim. Community Pharmacists' Knowledge, Attitude and Practice Towards Diabetes Care in Tripoli, Libya.. 3, 2011, Ibmossina J Med BS, Vol. 3, pp. 89-95.