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Pharmacists' Attitudes and Role in Diabetes Management in Bosnia and Herzegovina

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ABSTRACT

Introduction: Diabetes is the fastest growing chronic diseases worldwide and in Bosnia and Herzegovina. International standards for diabetes care have recognized the crucial role of pharmacists in diabetes management. Community pharmacists can provide services beyond medication dispensing inducing patient identification, assessment, education, referral, monitoring and behavioral counseling. Pharmacists' attitudes toward diabetes are generally positive but do not correlate with the degree of their involvement in diabetes management and frequency of providing diabetes-related services varied throughout countries. **Aim:** To measure pharmacists' attitude toward diabetes management and to identify pharmacy services that are currently provided to patients with diabetes. **Material and Methods:** We have conducted a descriptive, cross-sectional survey-based study among pharmacists from Bosnia and Herzegovina attending on of the conferences in May 2018. Majority of pharmacist attending such conferences are from community pharmacies across the whole country considering surveyed sample was representative. The questionnaire contained 3 different sections: a) participants' demographics, b) measured participants' attitude toward diabetes using the DAS-3 to measure participants' degree of agreement to 33 diabetes-related statements, on a 5-point Likert type scale and c) a list of possible diabetes patient support activities that could be delivered by pharmacists based on authors experience and available literature. **Results:** The majority of respondents (86,5%) were female and 53,8% work in private owned pharmacies. Interest in diabetes was indicated by 94,2% while 59,6% completed special diabetes continuing education in the past. All the respondents expressed positive attitudes in all DAS-3 with no significant difference between overall DAS-3 and subscale values. Provided services differ but mainly drug oriented and partially include comorbidity counseling. **Conclusion:** Pharmacists had positive attitudes toward diabetes but they provided limited diabetes-related services to patients. Additional special education is needed.

Keywords: Pharmacies, Diabetes, Community Pharmacy Services.

1. INTRODUCTION

Diabetes mellitus (Dabetes–DM) is one of the fastest growing chronic diseases worldwide, and is associated with significant morbidity, mortality and health care costs. It is estimated by International Diabetes Federation (IDF) that 327 million persons worldwide are diagnosed in 2017 and projecting this number to be increased by 2045 to 438 million (1).

Based on available data in Bosnia and Herzegovina (BiH) in Federation of BiH number of registered patients in 2017 was 76.808 while in the entity Republic of Srpska this number was 60.130 (2, 3). As stated in these reports these figures are underestimated since there are no available diabetes registries. Based on IDF Atlas 2017 it is estimated that there are more than 366 thousands adults with diabetes in BiH with prevalence of 12,5% (1).

The main objective of diabetes treatment is beyond glycemic control including prevention or delay of numerous of complications which can cause mortality or significantly decrease patient quality of life (4). Achieving near-normal glycated hemoglobin (HbA1c) significantly decreases risk of macrovascular and microvascular complications (5). Numerous pharmacological treatments for diabetes are available, but still, only about 50% of diabetic patients reach their HbA1c target (6).

International standards for diabetes care have recognized the crucial role of pharmacists in diabetes management (7). Pharmacists can provide services beyond medication dispensing, especially to diabetes patients inducing patient identification,

assessment, education, referral, monitoring and behavioral counseling.

Community pharmacists are considered to be the most accessible health care professionals, as no appointments are required to see them, and to have the highest level of patient contact. As such, they are well placed to play a significant role in the care of patients with diabetes.

On the other side, multidisciplinary team approach in the management of diabetes including collaboration of pharmacists, physicians and nurses can improve efficiency and cost-effectiveness of diabetes care (8, 9). Patient counseling can be helpful in improving the outcome of disease management, particularly chronic diseases such as diabetes (10).

The interventions of pharmacists have been proven to improve glycemic control, empower patients to self-management, and increase patients' satisfaction and quality of life (11).

In order to provide high quality of care health care providers, irrespective of the discipline in which they work, need to have knowledge of inpatient diabetes management.

The Diabetes Attitudes Scale DAS was designed to measure diabetes-related attitudes/beliefs, and following several modifications is now in its third version (12). The DAS3 measures diabetes-related attitudes. It consists of 33 items, and assesses attitudes towards diabetes in 5 categories, namely: seriousness of diabetes type 2, the need for special training of health care workers, the value of tight glucose control, the socio-economic impact of diabetes, and the need for patient autonomy.

Pharmacists' attitudes toward diabetes are generally positive however, this might not correlate with the degree of their involvement in diabetes patient education (13).

The frequency of providing diabetes-related services varied throughout countries which can be the result of the diverse practice settings, evolving role of the pharmacists, differences in teaching curricula of pharmacy schools, pharmacists becoming more involved in direct patient care and cultural diversity (11, 14).

2. AIM

The aim of our study was to measure pharmacists' attitude toward diabetes management and to identify pharmacy services that are currently provided to patients with diabetes in Bosnia and Herzegovina.

3. MATERIAL AND METHODS

We have conducted a descriptive, cross-sectional survey-based study among pharmacists from Bosnia and Herzegovina attending on of the conferences in May 2018. Majority of pharmacist attending such conferences are from community pharmacies across the whole country considering surveyed sample was representative. The questionnaire contained 3 different sections: (1) participants' demographics, (2) measured participants' attitude toward diabetes using the DAS-3 to measure participants' degree of agreement to 33 diabetes-related statements, on a 5-point Likert type scale and (3) a list of possible diabetes patient support activities that could be delivered by pharmacists based on authors experience and available literature.

4. RESULTS

Of 60 approached pharmacists 52 (86,7%) agreed to participate and completed the questionnaire. Respondents` demographic characteristics are provided in Table 1. The majority of respondents (n = 45; 86,5%) were female, and 53,8% work in private owned pharmacies. 49 (94,2%) of the respondents indicated an interest in diabetes, and 31 (59,6%) completed special diabetes continuing education in the past.

DAS-3 and subsets scores are given in Table 2. All the respondents expressed positive attitudes in all DAS-3. There was no significant difference between overall DAS-3 and subscale values based on weather pharmacists had participated in specialized education in the field

		N	Percentage (%)
Age (years)	20-29	20	38.5%
	30-39	23	44.2%
	>=40	9	17.3%
Gender	Male	7	13.5%
	Female	45	86.5%
Years of practice	<=5	29	55.8%
	6-10	12	23.1%
	>10	11	21.2%
Pharmacy ownership	State ownership	14	26.9%
	Private ownership	28	53.8%
	Other	10	19.2%
Level of education	MPharm	49	94.2%
	MPharm, Specialist	0	0.0%
	MSc	2	3.8%
	PhD	1	1.9%
Is diabetes an area that interests you?	Yes	49	94.2%
	No	3	5.8%
Have you ever completed special diabetes continuing education in the past?	Yes	31	59.6%
	No	21	40.4%

Table 1. Descriptive characteristics of respondents . MPharm – Master of Pharmacy, MSc – Master of Sciences; PhD – Doctor of Philosophy

Five subsets of DAS-3	Questions (n)	Median (IQR*)
Total DAS-3	33	3.7 (3.6 – 4.0)
Five subsets of DAS-3		
Need for special training	5	4,4 (4,05-4,8)
Seriousness of type 2 diabetes	7	3,9 (3,6-4,3)
Value of tight control	7	3,9 (3,7-4,1)
Psychosocial impact of DM	6	3,8 (3,4-4,1)
Patient autonomy	8	3,4 (3,1-3,8)

Table 2. Diabetes Attitude Scale-Version 3 (DAS-3) subscale scores. *IQR – Interquartile Range

	Frequency of providing this service to patients								
	Never		Rarely		Often		Always		Median (IQR)*
	n	%	n	%	n	%	n	%	
Services related to blood glucose monitoring									
Counsel on the use of a blood glucose meter, including how to obtain a blood sample	1	1.9	6	11.5	29	55.8	16	30.8	2 (2-3)
Counsel on the appropriate times to check blood glucose	0	0	9	17.3	27	51.9	16	30.8	2 (2-3)
Counsel on the current treatment targets for blood glucose	0	0	12	23.1	30	57.7	10	19.2	2 (1.75-2)
Counsel on the interpretation of A1C results	6	11.5	28	53.8	13	25	5	9.6	1 (1-2)
Provide drug therapy recommendations to the physician to help the patients goals	18	34.6	21	40.4	12	23.1	1	1.9	1 (0-2)
Services related to hypoglycemia management									
Counsel on signs and symptoms of hypoglycemia	3	5.8	15	28.8	27	51.9	7	13.5	2 (1-2)
Identify possible causes of hypoglycemia	5	9.6	22	42.3	21	40.4	4	7.7	1 (1-2)
Counsel on possible treatment of hypoglycemia	3	5.8	22	42.3	20	38.5	7	13.5	2 (1-2)
Services related to pharmacotherapy									
Prescription medications drug history	2	3.8	7	13.5	26	50	17	32.7	2 (2-3)
Over-the-counter products history	3	5.8	7	13.5	25	48.1	17	32.7	2 (2-3)
Nutritional supplements history	3	5.8	6	11.5	24	46.2	19	36.5	2 (2-3)
Counsel on the appropriate use of syringes and needles (e.g., sharp disposal)	7	13.5	15	28.8	17	32.7	13	25	2 (1-2.25)
Counsel on the appropriate storage of insulin	5	9.3	7	13.5	13	25	27	51.9	3 (1.75-3)
Counsel on appropriate insulin administration (mixing insulin, injection technique, timing of injection, rotation of sites)	5	9.6	9	17.3	15	28.8	23	44.2	2 (1-3)
Describe the appropriate time to administer each oral antidiabetic drug	5	9.6	5	9.6	2	38.5	22	42.3	2 (2-3)
Describe potential adverse effects of each oral antidiabetic drug	3	5.8	17	32.7	22	42.3	10	19.2	2 (2-3)
Services related to comorbid disease management									
Recommend anticoagulant therapy to the patient's physician	14	26.9	24	46.2	9	17.3	5	9.6	1 (0-2)
Provide education on the importance of controlling blood pressure in diabetes	3	5.9	6	11.8	25	49	17	33.3	2 (2-3)
Provide drug therapy recommendations to the physician to help better control of blood pressure	12	23.1	22	42.3	14	26.9	4	7.7	1 (1-2)
Provide education on the importance of regular screening of nephropathy (e.g., type of test)	12	23.1	17	32.7	18	24.6	5	9.6	1 (0.75-2)
Provide education on the importance of regular screening for neuropathic pain	9	17.3	17	32.7	16	30.8	7	13.5	1 (1-2)
Provide education on the importance of regular screening for retinopathy	9	17.3	20	38.5	16	30.8	7	13.5	1 (1-2)
Counsel on prevention and therapy of diabetic foot	5	9.6	19	36.5	18	34.6	10	19.2	2 (1-2)
Services related to healthy living choices									
Provide basic information on diet as it relates to diabetes management	3	5.8	4	7.7	27	51.9	18	34.6	2 (2-3)
Provide basic information on exercise as it relates to diabetes management	3	5.9	2	3.9	25	49	21	41.2	2 (2-3)

Table 3. Frequency of providing diabetes related services to patients with diabetes. *IQR – Interquartile Range

of diabetes. Pharmacists working in pharmacies owned by state had significantly more positive attitudes regarding patients autonomy (3,81 (3,34-4,16) when compared to pharmacists from privately owned pharmacies (3,03 (2,72-3,38); p=0,02). There was no significant difference between overall DAS-3 and other subscale values based on ownership of pharmacies. There was no significant difference in attitudes in overall DAS-3 and subscale values between pharmacists of different ages.

Considering pharmaceutical services provided in pharmacies the full analysis is presented in Table 3. The correlations between DAS-3 subscales and all groups of diabetic services are shown in Table 4. The respondents with overall more positive diabetes-related attitudes were less frequently involved in providing glucose monitoring, comorbid disease management, and healthy living choices.

5. DISCUSSION

Our study confirmed that pharmacists have overall positive attitude toward diabetes management. The most positive attitude was "the need for special training in patient education". Similar finding related to special training has been found in the study among the pharmacist regarding food supplement counseling (15). We have also found that majority of the respondents advice patients on over the counter products and providing counseling servicer regarding oral antidiabetic treatments. Especially it is interesting that pharmacists reported counseling regarding appropriate time of taking medicines and po-

	Blood glucose monitoring	Hypoglycemia management	Pharmacotherapy management	Comorbid disease management	Healthy living choices
Need for special training	0,247	0,256	0,099	0,296*	0,269
Seriousness of type 2 diabetes	0,071	0,254	0,167	0,290*	0,463**
Value of tight control	0,093	0,119	0,147	-0,028	0,206
Psychosocial impact of DM	0,076	0,227	0,112	-0,012	0,199
Patient autonomy	0,368**	0,372**	0,229	0,285*	0,134

Table 4. Correlations between DAS-3 subscale results and all groups of diabetes services (rho values). DM - diabetes mellitus. * - Correlation is significant at the 0.05 level (2-tailed). ** Correlation is significant at the 0.01 level (2-tailed).

tential side effects. Such services are of high importance from perspective of increasing medication adherence since this is of the key issues and treatment success and outcomes. Pharmacist-directed patient counseling combined with message reminder showed a greater effect on the improvement of medication adherence and control of glycaemia, blood pressure, and lipid profile in diabetes (16). We found negative correlations between DAS-3 scores and comorbid diseases regarding understanding of glucose level control and psychological impact of diabetes suggesting that pharmacist could play important role in patient counseling.

Pharmacist mainly provides services related to pharmacotherapy and mainly appropriate storage of insulin. Regarding services related to blood glucose monitoring in majority of cases pharmacist instruct patients on proper measurement and time of measuring blood glucose.

Published studies showed that pharmacist involvement in diabetes self-care interventions prove to be cost-effective and can significantly affect the condition of the diabetic patients and reduce the risk of complications (17). Previously published study on patients` perception of community pharmacists in BiH showed that patients have a positive overall perception of community pharmacists and of the services offered from community pharmacists (18).

Pharmacists never or rarely provide drug therapy recommendations to the physician to help the patients' goals. Even physicians and pharmacists agree that collaborative practice can positively affect patient outcomes and would like more collaboration opportunities they disagree about the areas where they would like to collaborate to deliver care (19).

In majority of cases pharmacist counsel patients regarding need of high blood control when it comes to servicer related to comorbid diseases, showing that additional education in this field should be performed. Cardiovascular (CV) complications of diabetes are common among these patients (20). Beside blood pressure control, pharmacists should pay more attention to other CV risk factors which are common in this patient population (21).

Other conditions like neuropathic pain, nephropathy and retinopathy are not in pharmacists focus even represent significant diabetes complications and pharmacists could contribute to its prevention and early detection (22).

We have found strong correlation between psychosocial impact of diabetes and concomitant diseases. Since one of diabetes treatment goals is as the achievement of patients` quality of life (QOL) pharmacists can significantly contribute in QOL improvement (23).

Although the role of the pharmacist in monitoring diabetes is not well defined it is becoming more and more important to be engaged and educated in this field. The pharmacist can play an important role in diabetes care by screening patients at high risk for diabetes, assessing patient health status and adherence to standards of care, educating patients to empower them to care for themselves, referring patients to other health care professionals as appropriate, and monitoring outcomes. Pharmacists who obtain training in diabetes management reap rewards in professional satisfaction and financial reimbursement (24, 25).

6. CONCLUSIONS

Our study demonstrated that pharmacists had positive attitudes toward diabetes but they provided limited diabetes-related services to patients. Additional special education is needed in order to improve pharmacists` competences to contribute better diabetes treatment outcomes. Widespread implementation of such services in the future will depend on legislative change, adequate funding (government and nongovernment), professional commitment, inter-professional collaboration, and consumer (patient) acceptance.

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REFERENCES

1. International Diabetes Federation. IDF Diabetes Atlas, 8th ed. Brussels, Belgium: International Diabetes Federation, 2017.
2. Institute for Public Health Federation of Bosnia and Herzegovina. Zdravstveno stanje stanovništva i zdravstvena zaštita u FBiH 2017. Sarajevo, 2018. Available at: https://www.zzjzf-bih.ba/wp-content/uploads/2018/10/Zdravstveno-2017..pdf (in Bosnian)
3. Public Health Institute Republic of Srpska. Zdravstveno stanje stanovništva Republike Srpske 2017. Banja Luka, 2018. Available at: https://www.phi.rs.ba/pdf/publikacije/Zdravstveno_stanje_stanovnistva_Republike_Srpske_u_2017_godini.pdf (in Bosnian)
4. Wing J, Jivan D. Targeting composite treatment of type 2 diabetes in middle-income countries–walking a tightrope between hyperglycaemia and the dangers of hypoglycaemia. S

Afr Med J. 2016; 106(1): 57-61.
5. Marín-Peñalver JJ, Martín-Timón I, Sevillano-Collantes C, Del Cañizo-Gómez FJ. Update on the treatment of type 2 diabetes mellitus. World J Diabetes. 2016; 7(17): 354-395. doi:10.4239/wjd.v7.i17.354.
6. del Cañizo-Gómez FJ, Moreira-Andrés MN. Cardiovascular risk factors in patients with type 2 diabetes. Do we follow the guidelines? Diabetes Res Clin Pract. 2004; 65: 125-133.
7. American Diabetes Association. 16. Diabetes Advocacy: Standards of Medical Care in Diabetes-2019. Diabetes Care. 2019 Jan; 42(Suppl 1): S182-S183.
8. Farsaei S, Sabzghabaee AM, Zargarzadeh AH, et al: Effect of pharmacist-led patient education on glycemic control of type 2 diabetics: a randomized controlled trial. J Res Med Sci. 2011; 16: 43-49.
9. Mouhtadi BB, Alame MM, Malaeb B, Hallit S, Salameh P, Malaeb D. Physician-community pharmacist collaborative care in diabetes management: a pilot study. J Drug Assess. 2018; 7(1): 61-65.
10. Emeka PM, AlMunjem MF, Rasool ST, Kamil N. Evaluation of Counseling Practices and Patient's Satisfaction Offered by Pharmacists for Diabetics Attending Outpatient Pharmacies in Al Ahsa. Journal of Patient Experience. 2019. https://doi.org/10.1177/2374373519846945.
11. Al Haqan AA, Al-Taweel DM, Awad A, Wake DJ. Pharmacists' Attitudes and Role in Diabetes Management in Kuwait. Med Princ Pract. 2017; 26(3): 273-279.
12. Anderson RM, Fitzgerald JT, Funnell MM, Gruppen LD. The third version of the Diabetes Attitude Scale. Diabetes Care. 1998; 21(9): 1403-1407.
13. Younis WS, Campbell S, Slack MK: Pharmacists'attitudes toward diabetes and their involvement in diabetes education. Ann Pharmacother. 2001; 35: 841-845.
14. Simpson H, Haggarty H, Johnson J, et al: Survey of pharmacist activities and attitudes in diabetes management. Can Pharm J. 2009; 142: 128-134.
15. Catic T, Jusufovic R. Use of Food Supplements in Diabetes Mellitus Treatment in Bosnia and Herzegovina from the Pharmacists Perspective. Mater Sociomed. 2019; 31(2): 141-145.
16. Goruntla N, Mallela V, Nayakanti D. Impact of Pharmacist-directed Counseling and Message Reminder Services on Medication Adherence and Clinical Outcomes in Type 2 Diabetes Mellitus. J Pharm Bioallied Sci. 2019; 11(1): 69-76
17. Jamshed SQ, Siddiqui MJ, Rana B, Bhagavathula AS. Evaluation of the Involvement of Pharmacists in Diabetes Self-Care: A Review From the Economic Perspective. Front Public Health. 2018; 6: 244.
18. Catic T, Jusufovic FI, Tabakovic V. Patients perception of community pharmacist in Bosnia and Herzegovina. Mater Sociomed. 2013; 25(3): 206-209.
19. Kelly DV, Bishop L, Young S, Hawboldt J, Phillips L, Keough TM. Pharmacist and physician views on collaborative practice: Findings from the community pharmaceutical care project. Can Pharm J (Ott). 2013; 146(4): 218-226.
20. Einarson TR, Acs A, Ludwig C. Prevalence of cardiovascular disease in type 2 diabetes: a systematic literature review of scientific evidence from across the world in 2007–2017. Cardiovascular Diabetology. 2018; (17): 83. doi.org/10.1186/s12933-018-0728-6.
21. Omboni S, Caserini M. Effectiveness of pharmacist's intervention in the management of cardiovascular diseases. Open Heart. 2018; 5(1): e000687. doi:10.1136/openhrt-2017-000687.
22. Weber ZA, Kaur P, Hundal A, Ibriga SH, Bhatwadekar AD. Effect of the pharmacist-managed cardiovascular risk reduction services on diabetic retinopathy outcome measures. Pharm Pract (Granada). 2019; 17(1): 1319. doi:10.18549/PharmPract.2019.1.1319.
23. Saisho Y. Use of Diabetes Treatment Satisfaction Questionnaire in Diabetes Care: Importance of Patient-Reported Outcomes. Int J Environ Res Public Health. 2018; 15(5): 947. doi:10.3390/ijerph15050947.
24. Campbell RK. Role of the pharmacist in diabetes management. Am J Health Syst Pharm. 2002; 1; 59 Suppl 9: S18-21.
25. Hughes JD, Wibowo Y, Sunderland B, Hoti1 K. The role of the pharmacist in the management of type 2 diabetes: current insights and future directions. Integrated Pharmacy Research and Practice. 2017; 6: 15-27.