Original article

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KNOWLEDGE, ATTITUDE AND BEHAVIOUR TOWARD OWN DISEASE AMONG PATIENTS WITH TYPE 2 DIABETES

SUMMARY

Diabetes mellitus, as chronic dissease, with its wide presence in general population, complex and financially demanding therapy, solicit a necessity of constant and coordinated cooperation beetwen medical professionals and patients, on the topics considering prevention and reduction of the consequences of the dissease.

The aim of the paper was to provide quantitative insight into knowledge about own dissease in diabetes mellitus (type 2) patients, as well as their behaviour toward own disease during the therapy.

The research included 45 diabetes mellitus outpatients, with mean age of 64.68±10.69 years, treated in the Health Care Centre Merošina. Quantitative scorring of patient`s knowledge about own dissease and behaviour, as well as socio-epidemiological anamnesis were performed by use of standardized questionary; their body weight and height were measured, body mass index was calculated, and all quantified variables were statistically analyzed.

Average score of patient`s knowledge about diabetes was 15±5.02, which is considered insufficient even though more than half of examinees has satisfying knowledge of symptoms, complications and prevention of diabetes. Minimal score of knowledge was 7, and maximal 24. Male patients showed slightly better knowledge scores (17.8±4.64) about own dissease than females, however, without statistically significant difference. Average score of attitude was 3.96±1.48 points, and could be considered as satisfactory. There is the necessity for precise determination of medical education effects in specific populations, i.e. population of diabetes mellitus patients, where personal participation has major influence on efficacy of terapy.

Key words: diabetes, knowledge, practical attitudes, education

INTRODUCTION

The prevalence of diabetes mellitus (especially type 2) across the world is in constant increase, with estimation of 4% in adults older than 20 years in 1995, reaching the value of 5,5% in 2005 (1,2). According to the World Health Organization, by 2025, 7-13% of all health care costs will have been designated to diabetes, with the overall sum expences from 213 to 396 billion dollars (3,4).

For the lack of precise and modern medical information system in our country, there is no valid insight into diabetes frequency. However, complementary studies, like the study of Disease Burden and Injuries in the Republic on Serbia, showed that diabetes mellitus is among ten most

significant causes of death (5). The presumed number of the subjects suffering from diabetes in our country amounts to 475.000 (6), also including those with pathological findings on the glucose tolerance test. An average incidence of diabetes mellitus in the District of Niš during the period 1986 - 1996 was 105,2 per 100 000 inhabitants (7,8).

Diabetes is characterised by long course and numerous vascular complications, with significant expences on health insurance budget (9). It is obvious that prevention of diabetes is one of the major goals in medical practice.

The aim of this research was to provide the quantitative insight into knowledge and attitudes about own dissease in diabetes mellitus (type 2) patients, as well as in their behaviour during the therapy.

PATIENTS AND METHODS

The study was undertaken in the Primary Health Care Centre Merošina situated in at the territory of the Municipality of Merošina, with 15.729 inhabitants, according to the population census from 2002, of which 80% were professionally engaged in agriculture (8). The study encompassed 45 patients with diabetes mellitus type 2, treated in the Primary Health Care Centre Merošina during the period September 2008 - April 2009. The inclusion criteria for the study were: patient age > 18 years, confirmed diagnosis of diabetes mellitus type 2, and duration of the disease.

Data related to socio-epidemiological status of examinees, their knowledge, and practical attitudes toward own dissease were collected by using questionnaire given to each patient. The originally designed questionnaire represents a modification according to similar research (10), with adaptations appropriate for domestic population. The questionnaire contained questions about individual data (gender, age, education), 30 questions for the estimation of their knowledge about diabetes mellitus, 6 questions about their attitude toward diabetes, and 3 questions about their practical relation to the dissease. Maximal score of knowledge was 30, score of attitude 6, with 1 point for each true answer, and 0 for false. The overall score of knowledge >20-30 was considered sufficient, 10-20 insufficient, and ≤ 10 poor. Atittude score between 2-3 was considered sufficient, and <1 to 2 insufficient, more than 4 good.

Anthropometric nutritional status was estimated according to calculated body mass index (standard procedure, body mass and body height). Examinees with body mass index ≥ 30 kg/m^2 were considered obese, and above 25 kg/m^2 pre-obese.

Estimation of the correlation between knowledge, atittudes and practical behaviour was preformed using the SPSS 10 system, and by performing the multiple linear regression.

RESULTS

Forty-five examinees with diabetes type 2 showed gender distribution of 35 female, and 10 male examinees. Age range was 46-89 years, with two thirds - 30 patients (66,66%) older than 60 years (*Graph 1*), and average age of 64,68±10,69 years (males 62.23±10.36, females 65.38±10.82). Ten (22,2%) examinees completed higher education, and 35 (77,8%) examinees completed elementary school.
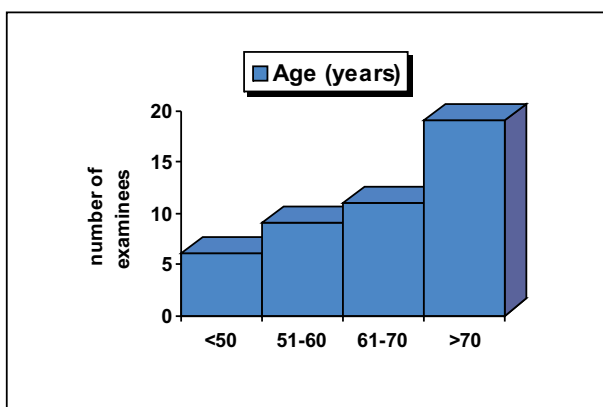

Graph 1. Age distribution of examinees

Most of the patients (n=35, 77,8%) were pre-obese or obese (*Graph 2*), with average body mass index in males 28,59±5,38 kg/m^2, and 28,4±3,71 kg/m^2 for females.
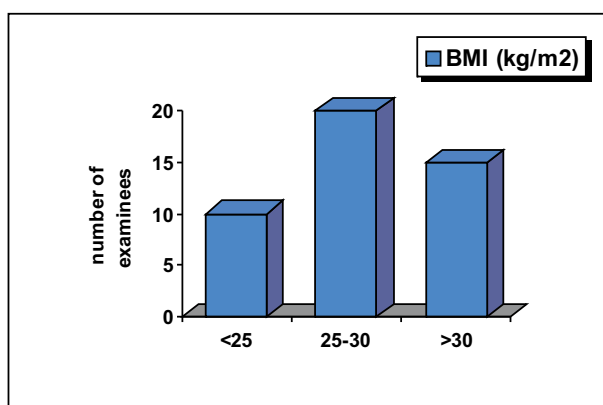
Graph 2. Structure of examinees according to nutritional status

Most of examinees 43 (95,6%) mentioned medical professionals as the source of information about diabetes, 2 (5%) examinees quoted media and social environment (*Graph 3*).
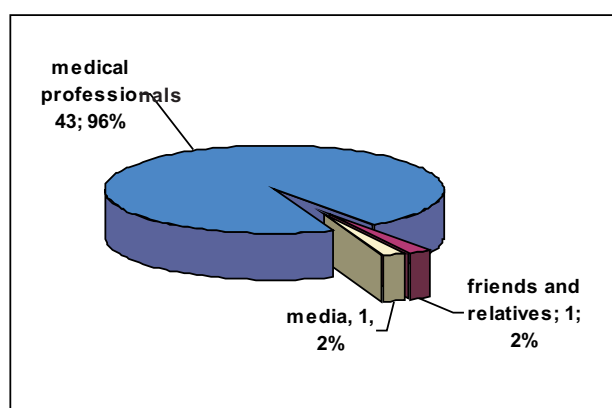
Graph 3. Source of information about diabetes

vention of diabetes (*Table 1, Table 2*). Most of the polled patients were aware that symptoms such as excessive thirst, urination, and hunger are associated with diabetes; however, only 10 (22,2%) of them knew that gaining of body weight was not a symptom of diabetes.

Mann-Whitney test did not show statistically significan difference between answers of male and female examinees (p>0,01).

The examinees were generally familiar with the fact that diabetes could provoke other health problems. Most of them - 35 (77,8%) were aware that diabetes could lead to blindness as well as to limb loss - 30 (66,7%). Less than half of the examinees knew about other health complications in diabetes.

Table 1. Distribution of frequency of answers about diabetes symptoms

Category of knowledge	Correct answer N (%)	Incorrect answer or «do not know» N(%)	Sum N (%)
Gaining of body weight	10 (22.2%)	35 (77.8%)	45(100)
Frequent thirst	35 (77.8%)	10 (22.2%)	
Frequent urination	37 (82.2%)	8 (17.8%)	
Frequent feeling of hunger	28(62.2%)	17(37.8%)	
Goes without symptoms	12 (26.7%)	33(73.3%)	

The first question in domain of knowledge on diabetes was «What is diabetes?». The majority of examinees, 28 (62,2%), gave correct answer; however, more than one third of patients - 17 (37,8 %) did not know what diabetes was or answered falsely. Statistically significant difference between answers of men and women was not found ($\chi2$=1.814, p>0.01).

The examinees demonstrated average knowledge of symptoms, complications, and pre-

The majority of examinees 42 (93,3%) were acquainted with the fact that diabetes complications could be prevented by correct nutrition and regular physical activity - 31 (68,9%). A rather small number of examinees - 4 (8,9%) knew that periodical control and regulation of body weight was necessary.

Thirty-one (68,9%) examinees stated that regular physical activity was important for control of body weight, and nearly half of the examined patients knew for its significance in reduction of

Table 2. Distribution of frequency of answers about complications and possible prevention of diabetes

Category of knowledge	Correct answer N (%)	Incorrect answer or «do not know» N(%)	Sum N (%)
Coronary heart disease	19 (42.2%)	26 (57.8%)	45(100)
Stroke	19 (42.2%)	26 (57.8%)	45(100)
Limb loss	30 (66.7%)	15 (33.3%)	45(100)
Renal complications	19 (42.2%)	26 (57.8%)	45(100)
Blindness	35 (77.8%)	10 (22.2%)	45(100)
Regular physical activity	31 (68.9%)	14 (31.1%)	45(100)
Control of body weight	4 (8.9%)	41 (91.1%)	45(100)
Quitting tobacco smoking	26 (57.8%)	19 (42.2%)	45(100)
Diet	42 (93.3%)	3 (6.7%)	45(100)

glycemia, blood level of cholesterol, and hypertension (*Table 3*).

patients had positive attitude toward self-control in diabetes (*Table 6*).

Table 3. Distribution of frequency of answers about physical activity importance

Category of knowledge	Correct answer N (%)	Incorrect answer or «do not know» N(%)	Sum N (%)
Control of body weight	31 (68.9%)	14 (31.1%)	45(100)
Reduction of glycemia	25 (55.6%)	20 (44.4%)	45(100)
Lowering of cholesterol blood levels	23 (51.1%)	22 (48.9%)	45(100)
Reduction of blood pressure	22 (48.9%)	23 (51.1%)	45(100)
Reduction of stress	24 (53.3%)	21(46.6%)	45(100)

Table 4 shows data related to knowledge about dietetic regime in diabetes.

Average attitude score of examinees was 3.96±1.48 points and could be considered satisfying.

Table 4. Distribution frequency of answers about dietetic regime in diabetes

Category of knowledge	Correct answer N (%)	Incorrect answer or «do not know» N(%)	Sum N (%)
Low fat diet	25 (55.6%)	20 (44.4 %)	45 (100)
Diet with low cholesterol content	18 (40.0%)	27 (60.0%)	45 (100)
Diet with low carbohydrates content	17 (37.8%)	28 (62.2%)	45 (100)
Intake of dietary fibers	8 (17.8%)	37 (82.2%)	45 (100)
Protein rich diet	10 (22.2%)	35 (77.8%)	45 (100)
Forbidden sugar	36 (80.0%)	9 (20.0%)	45 (100)
Bread is better than rice	8 (17.8%)	37 (82.2%)	45 (100)
It is advisable to take any type of food in defined proportions	10 (22.2%)	35 (77.8%)	45 (100)
Fruit intake	44 (97.8%)	1 (2.2%)	45 (100)
Skipping meals	45 (100%)	45 (100%)	45 (100)

Average score of knowledge about diabetes was 15,6±5,02, with the score range 7 - 24. Men had slightly better score of knowledge (17,8±4,64) compared to women (14,97±5,0); however, the difference did not have statistical significance. Also, younger patients showed better knowledge than the older ones (*Table 5*).

The regression model involved the following variables: gender, age, education, score of knowledge and score of attitudes, and the outcome variable was the score of behaviour (*Table 7*). The model implies that gender exerted the strongest influence on behaviour, and not knowledge or attitudes.

Table 5. Average score of knowledge about diabetes distributed by age groups

Age	N	X ± SD	min	max
Younger than 50 years	6	20,33 ± 4,46	13	24
> 50-60 years *	9	18 ± 3,12	14	23
> 60-70 years	13	14,85± 5,29	8	24
>70 years	17	13,24± 4,37	7	21
Sum	45	15,6±5,02	7	24

* 2=16.25 p=0.001

Testing the relation between attitude and knowledge showed that 34 (75,6%) examinees had positive attitude about physical activity practising; 36 examinees (80%) claimed to be capable of changing nutritional habits, and 28 (62,2%) stated that could control their own body weight. Majority of

According to the second model, the gender influenced the behaviour score of examinees (p=0,018).

Tabela 6. Distribution of frequency of attitudes associated with diabetes

Attitude	Positive	Undecided or negative	Sum N (%)
Regular physical activity	34 (75.6%)	11 (24.4%)	45 (100)
«I can easily change my habits in diet»	36 (80.0%)	9 (20.0%)	45 (100)
«I can eat without restrictions if I am in good health»	19 (42.2%)	26 (67.8%)	45 (100)
«I can maintain optimal body weight»	28 (62.2%)	17 (37.8%)	45 (100)
«People with diabetes can enjoy life»	33 (73.3%)	12 (26.7%)	45 (100)
«Patients should take responsibility in control of own diabetes»	37 (82.2%)	8 (17.8%)	45 (100)

Table 7. Model of logistic regression – statistically significant variables (first model)

Variable	B*	SE**	β***	p
Gender	-0.430	0.196	-0.335	**0.035**[#]
Age	0.001449	0.009	0.029	0.871
Education	0.165	0.241	0.129	0.496
Score of knowledge	0.003829	0.02	0.036	0.848
Sore of attitudes	0.103	0.061	0.282	0.097

* Coefficient of logistic regression
** Standard error
*** Standardized coefficient beta
[#] Statistically significant

DISCUSSION

In the analyzed sample, the female gender dominated, which is in accordance with gender distribution in our country. Majority of examinees (77,8%) were overweight (body mass index >25kg/m^2), with more than one third of them being obese. The sample of our research shows slightly higher percentage of obesity compared to the study done in Malaysia on female diabetic patients (type 2) (10), which found that 68,4% of examinees had body mass index over 25kg/ m^2, where both results are in keeping with the fact that obesity is the major risk factor for the onset of diabetes type 2 (1, 2, 5, 11).

In our study, the examinees (96,5%) mention medical professionals as the chief source of information about diabetes which is more than in similar researches (10, 11). The Primary Health Care Centre Merosina is well equipped with health education materials on recommended diets, importance of physical activities, and other preventive measures, as well as information about symptoms and complications in diabetes. Patients were advised during regular ambulatory medical examinations; however, the chief problem was the low education level of dominant agricultural population.

The examinees were questioned about six aspects of knowledge on diabetes – what they knew about their own disease, symptoms, complications, prevention, diet and physical exercise. 62,2% of them were aware of what diabetes was; however, this percentage was higher than the one presented in the study done in Malaysia (10) and developed countries (1), where it amounts to 74,1%.

Beside insufficient knowledge about definition, the patients had mean score of knowledge 15±5.02, which points to average level of knowledge, which could be considered as insufficient. Examinees under the age of 60 had better score of knowledge. According to answers about diabetes symptoms, it is obvious that patients are familiar with this aspect of their disease. They are well informed about blindness and limb loss as possible complications of diabetes, however, less than half of examinees know that cardiovascular, renal complications, and stroke are also associated

with their dissease. In prevention of diabetes, the patients consider as key the following preventive factors: optimal diet (93,3%), regular physical activity (68,9%), and smoking cessation (57,8%). Markedly small number of examinees - 4 (8,9%) know that periodical control and regulation of body weight are necessary for prevention of diabetic complications.

Our study shows that care about own health as well as willingness for better therapy outcome were positive in all examinees, according to their claim for change in type of diet, use of moderate physical activity and wish for maintanance of optimal body weight. Our results differ from results of other studies undertaken in different countries (10, 11), where relation between knowledge about the disease and attitudes was proven, as well as between attitudes and behaviour toward own disease and practice. This could be explained by the fact that the aforesaid foreign studies polled the patients from urban environment compared to our patients being mainly from rural environment.

Modern studies on predictive and prognostic markers of diabetes are based on better understanding of social, behevioral, and environmental factors (12-15). Regular physical activity and proper diet lower progression of diabetes mellitus as well as of other risk factors: hypertension, dyslipidemia, obesity, and ishaemic heart disease.

CONCLUSION

Our study presents an average score of knowledge (15±5.02) about diabetes among diabetic patients in Merošina Municipality, which could be considered insufficient, even though more than half of examinees was familliar with symptoms, complications and prevention of diabetes. Relatively modest kowledge about use of apropriate diet in diabetes was shown. It is optimistic that most of examinees have positive attitude about self-control in diabetes.

Based on our results, new measures for improval of knowledge and attitudes toward own disease in diabetic patients should be recomended and implemented in daily medical prevention. This measures should contain facts about diabetes and point out the symptoms, complications, diet, physical activity, as well as the methods of prevention, and should be implemented in all levels of education, including schools, working places, and through public educa-tion with seminars. In rural areas, the implementa-tion of these programmes is also necessary. Medical professionals should have time to acquaint patients (especially those living in small urban areas) with the facts about diabetes trough counselings and home visits.

Studies with similar context, however, with better possibilities, comprising larger number of samples are recomended, with the aim to investigate other related factors, especially the factors of practice and understanding of the disease.

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INFORMISANOST, STAVOVI I PONAŠANJE PREMA SOPSTVENOJ BOLESTI KOD BOLESNIKA SA ŠEĆERNOM BOLEŠĆU TIP2

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SAŽETAK

Šećerna bolest, svojim hronicitetom, zastupljenošću u opštoj populaciji, kompleksnim i materijalno zahtevnim lečenjem, nameće potrebu neprekidne koordinacije između zdravstvenih radnika i bolesnika sa ciljem sprovođenja prevencije i ublažavanja posledica bolesti.

Cilj rada bio je stvaranje kvantitativnog uvida o opštem poznavanju sopstvene bolesti kod bolesnika sa dijabetes melitusom tip 2, kao i njihovog ponašanja prema sopstvenoj bolesti tokom procesa lečenja.

U ispitivanje je uključeno 45 bolesnika sa šećernom bolešću tip 2, ambulantno lečenih u Domu zdravlja – Merošina, prosečne starosti 64.68±10.69 godina. Kvantitativna procena poznavanja sopstvene bolesti i ponašanja kod ispitanika, kao i socio-epidemiološka anamneza, sprovedeni su primenom uniformnog upitnika, merenjem telesne težine, telesne visine i izračunat je indeks telesne mase ispitanika, a sve dobijene vrednosti obrađene su statističkim metodama.

Prosečan skor znanja o dijabetesu kod ispitanika iznosio je 15±5.02, što se smatra nedovoljnim, iako više od polovine ispitanika ima zadovoljavajuće znanje o simptomima, komplikacijama i prevenciji šećerne bolesti. Minimalni skor znanja kod ispitanih bolesnika bio je 7, a maksimalan 24. Muškarci su imali nešto bolji skor znanja o dijabetesu (17.8±4.64) u odnosu na žene (14.97±5.0), ali utvrđena razlika u znanju nije bila statistički značajna. Prosečan skor stavova ispitanika iznosio je 3.96±1.48 poena i može se smatrati zadovoljavajućim, međutim, ponašanje bolesnika nije bilo u potpunosti usklađeno sa njihovim znanjem i stavovima. Nameće se neophodnost preciznog određivanja efekata medicinske edukacije kod specifičnih delova populacije, kao što su bolesnici oboleli od šećerne bolesti, kod kojih je lična angažovanost od presudnog značaja za proces efikasnog lečenja.

Ključne reči: **šećerna bolest, informisanost, praktični odnos, edukacija**