The influence of drug treatment on the QoL of people with diabetes

A influência do tratamento medicamentoso na qualidade de vida de diabéticos

La influencia del tratamiento farmacológico para la calidad de vida de personas con diabetes

Claudete Moreschi iD
Regional Integrated University of Alto Uruguai and Missões (*Universidade Regional Integrada do Alto Uruguai e das Missões*) - Santiago (RS) - Brazil

Daiana Foggiato de Siqueira iD
Federal University of Santa Maria (*Universidade Federal de Santa Maria*) - Santa Maria (RS) - Brazil

Luís Felipe Pissaia iD
University of Vale do Taquari (*Universidade do Vale do Taquari*) - Lajeado (RS) - Brazil

Dirce Stein Backes iD
Franciscan University (*Universidade Franciscana*) - Santa Maria (RS) - Brazil

Carmen Neri Fernández Pombo iD
University of Vigo (*Universidade de Vigo*) - Vigo - Pontevedra - Spain

Claudete Rempel iD
University of Vale do Taquari (*Universidade do Vale do Taquari*) - Lajeado (RS) - Brazil

ABSTRACT

Objective: To analyze adherence to drug treatment in people with diabetes and its relationship to quality of life. **Methods:** This cross-sectional study was carried out with 350 people with diabetes in the municipality of Lajeado, Rio Grande do Sul, Brazil. Data were collected through the Measurement of Adherence to Treatment (MAT) and the WHOQoL-bref questionnaires, which were administered at the participants' homes during the year 2015. **Results:** Most of the people with diabetes analyzed take the oral antidiabetic drug metformin (n=305; 87.1%), followed by glibenclamide (n=151; 43.1%), and 20.9% (n=73) use insulin. The majority takes simvastatin (n=259; 74%), acetylsalicylic acid (ASA) (n=203; 58%), enalapril (n=192; 55%), and hydrochlorothiazide (n=180; 52%). This population group positively adheres to the drug treatment regime for the control of the disease the mean overall quality of life is good (67.6±18.1). The mean quality of life score among people who adhere to drug the treatment is higher (68.6±15.9) compared to those who do not (60.9±14.2) (t=3.3162; p= 0.0012). **Conclusion:** In this sample of people with diabetes, those who exhibited good adherence to the drug treatment regime for the control of the disease also presented better quality of life compared to those who exhibited poor adherence to the drug treatment.

Descriptors: Diabetes Mellitus; Primary Health Care; Health Promotion.

RESUMO

Objetivo: *Analisar a adesão de pessoas diabéticas ao tratamento medicamentoso e sua relação com a qualidade de vida.* ***Métodos:*** *Estudo transversal desenvolvido com 350 pessoas com diabetes no município de Lajeado, Rio Grande do Sul. A coleta de dados ocorreu por meio dos questionários Medida de Adesão ao Tratamento (MAT) e Whoqol-bref, aplicados no domicílio dos participantes durante o ano de 2015.* ***Resultados:*** *A maioria das pessoas com diabetes investigadas toma o antidiabético oral metformina (n=305; 87,1%), seguido de glibenclamida (n=151; 43,1%), e 20,9 % (n=73) fazem uso de insulina. A maioria toma sinvastatina (n=259; 74%), ácido acetilsalicílico (AAS) (n=203; 58%), enalapril (n=192; 55%) e hidroclorotiazida (n=180; 52%). Essa população adere positivamente ao tratamento medicamentoso relativo ao controle da doença e a média geral de qualidade de vida é boa (67,6±18,1). A média de qualidade de vida das pessoas que aderem ao tratamento medicamentoso é maior (68,6±15,9) do que as que não aderem (60,9±14,2) (t=3,3162; p= 0,0012).* ***Conclusão:*** *Constatou-se nessa amostra de diabéticos que os que têm melhor adesão ao tratamento medicamentoso relativo ao controle da doença também apresentam uma melhor qualidade de vida quando comparados com o grupo que tem menor adesão aos medicamentos.*

Descritores: *Diabetes Mellitus; Atenção Básica à Saúde; Promoção da saúde.*

Moreschi C, Siqueira DF, Pissaia LF, Backes DS, Pombo CNF, Rempel C

RESUMEN

Objetivo: *Analizar la adhesión de personas con diabetes para el tratamiento farmacológico y su relación con la calidad de vida.* **Métodos:** *Estudio transversal desarrollado con 350 personas con diabetes del municipio de Lajeado, Río Grande de Sur. La recogida de datos se dio a través de los cuestionarios Medida de Adhesión al Tratamiento (MAT) y el Whoqol-bref que han sido aplicados en el domicilio de los participantes durante el año 2015.* **Resultados:** *La mayoría de las personas con diabetes investigadas toma el fármaco oral para la diabetes metformina (n=305; 87,1%), seguido del glibenclamida (n=151; 43,1%) y el 20,9 % (n=73) usa la insulina. La mayoría toma la sinvastatina (n=259; 74%), el ácido acetilsalicílico (AAS) (n=203; 58%), el enalapril (n=192; 55%) y la hidroclorotiazida (n=180; 52%). Esa población tiene adhesión al tratamiento farmacológico para el control de la enfermedad y la media general de la calidad de vida es buena (67,6±18,1). La media de la calidad de vida de las personas que tiene adhesión al tratamiento farmacológico es mayor (68,6±15,9) de que las que no adhieren al tratamiento (60,9±14,2) (t=3,3162; p=0,0012).* **Conclusión:** *En esa muestra de diabéticos se constató que los que tienen mejor adhesión al tratamiento farmacológico para el control de la enfermedad también tienen mejor calidad de vida comparándolos con el grupo de menor adhesión a los fármacos.*

Descriptores: *Diabetes Mellitus; Atención Primaria de Salud; Promoción de la Salud.*

INTRODUCTION

Diabetes mellitus (DM) is a disease, or a metabolic syndrome, characterized by the body's inability to produce insulin or to synthesize it – both etiologies can occur in the same case[1]. It should be noted that, according to the World Health Organization (WHO), DM is the major cause of death and disability worldwide[2]. Some of the main problems resulting from this disease are episodes of hypoglycemia and hyperglycemia, the latter being responsible for long-term tissue damage in organs such as the heart and kidneys[3].

Due to the high number of people with DM seeking primary care and the expenses resulting from hospitalizations and medications, the Ministry of Health (MoH) recognized the need to reorganize the care offered to this specific population[4]. Aiming at the effectiveness of health actions, the National Plan for the Reorganization of Care for Arterial Hypertension and Diabetes Mellitus was instituted through the Family Health Strategies (*Estratégia de Saúde da Família - ESF*)[5].

The care provided to this public requires a long period of adaptation to treatment, the development of self-care, family support, and health monitoring and surveillance by Primary Health Care (*Atenção Primária à Saúde - APS*)[6]. The treatment of DM is carried out through interventions aimed at self-acceptance of the disease, with drug and non-drug measures[7].

Drug treatments, including oral antidiabetics and insulin, as well as the prescription of these medications, are performed by trained professionals and are not necessary for all patients with DM[7]. Non-drug treatments are encouraged for all patients. Examples include adherence to healthy eating habits, physical activity, monitoring of blood glucose levels and limited drinking and smoking[8].

Adherence to treatment influences the quality of life of people with DM by reducing the risks of complications associated with the pathology, considering the person's understanding of the disease as the main form of social awareness. Health professionals have health education instruments as allies in the mutual understanding of their community about good health practices and seek, in addition to health promotion, the effective provision of care to people with DM[9].

It is important to consider that QoL is related to subjectivity and multidimensionality, as well as the presence of positive and negative dimensions for each person. Thus, according to the WHO definition, QoL means "the individual's perception of their position in life in the context of their culture and in the value system in which they live and in relation to their expectations, standards and concerns". This is considered a broad concept as it incorporates, in a complex way, physical health, psychological status, level of independence, social relationships, personal beliefs, and the relationship with significant aspects of the environment[10].

Sustained in a cross-cultural perspective, WHO built an instrument for assessing QoL called World Health Organization Quality of Life (WHOQOL). This instrument addresses the subjectivity of the assessment, which is related to the cultural, social and environmental context. The respondent's/person's perception is assessed and not the objective nature of the environment, the functional status, or the psychological status, or even how the health professional or a family member assesses these aspects[11].

Thus, based on science, the present study aimed to analyze adherence to drug treatment in people with diabetes and its relationship to quality of life, seeking evidence for strengthening health practices in order to contribute to programs to promote health and improve care for people with DM.

METHODS

This is a cross-sectional study of 350 people with DM monitored by the 14 ESF of a city in the countryside of the state of Rio Grande do Sul. The number of DM cases registered in 2013 in the Primary Care Information System (*Sistema de Informação da Atenção Básica - SIAB*) was used to compose the study sample. During this period, there were 1,125 people aged 18 or over with DM in the municipality. Thus, the composition of a sample with 95% confidence and 4.4% error resulted in 350 participants in the study.

The municipality has 71,445 inhabitants and considered highly urbanized, with 99.9% of the population in the urban area, that is, 71,180 inhabitants[12]. A total of 25 individuals aged over 18 years were randomly selected from each of the 14 ESF to participate in the study. Data collection took place during 2015 in the participants' homes.

Information was collected through an author-developed questionnaire that addressed the epidemiological profile of individuals with DM. The questionnaire included sociodemographic variables and questions on the drugs used by the study population. The sociodemographic variables analyzed in the epidemiological profile questionnaire included: age, sex, color, occupation (work), level of education, marital status, religion, monthly household income, and medications used.

The Measurement of Adherence to Treatment (MAT) questionnaire, which assesses adherence to drug treatment, and the WHOQOL-bref questionnaire were used to assess the respondents' QoL. The MAT questionnaire consists of seven items whose responses are given on a Likert scale ranging from 1 to 6, where 1 corresponds to always and 6 corresponds to never. The sum of the values obtained is divided by seven, a number referring to the number of questions in the MAT questionnaire. Final values 5 and 6 are assigned the concept "1" (adherence, as in the original scale) and the remaining values are assigned the concept zero (non-adherence, as in the original scale), with the dichotomous scale yes (1)/no (0) (adherence/non-adherence to the use of medications)[13].

The WHOQOL-bref is a scale for measuring QoL in adults from a cross-cultural perspective, considering as essential characteristics the subjective nature of QoL and its multidimensional nature. It consists of self-administered questions and addresses the perception of the subjects in their context, considering their culture and values regarding their QoL. Through this questionnaire, the respondents reflect on the last two weeks of their life and assess how they feel about their QoL, considering their values, aspirations, pleasures and concerns, and pointing out only one of the five alternatives presented for each of the questions[11].

WHOQOL-bref consists of 26 questions, named facets, in which four domains are investigated: physical, psychological, environmental and social relations. The determination of the scores of the WHOQOL-bref domains is carried out in stages. First, all the items included within a domain are added and then divided by the mean number of questions answered. After that, the result is multiplied by four. In the second step, the value of four is subtracted for each domain and multiplied by 6.25 (or 100/16). Thus, the final result of each domain will range from 0 to 100. For a better understanding of the QoL of people with DM, a Likert scale divided into five classes of equal size is used: very poor (0-20); poor (21-40); neither poor nor good (41-60); good (61-80); very good (80-100)[11].

The questionnaires were applied at the time of the home visit. For those with difficulties, the research instrument was read, and they were helped with filling out the responses indicated.

The responses to the questionnaires (socioeconomic, MAT and WHOQOL-bref) were tabulated in Microsoft Excel spreadsheets. The analysis of socioeconomic data was performed using descriptive statistics in the Statistical Package for the Social Sciences - SPSS, version 21, with the data presented in the form of relative (%) and absolute frequencies. For the MAT and WHOQOL questionnaires, the syntax provided for each one was used and the data were generated in an Excel spreadsheet. The results are shown by means of graphs and tables in addition to the mean (standard deviation). Statistical differences in the mean QoL score of people who adhere and do not adhere to treatment were checked by "t" test for independent samples using the SPSS software.

The study was approved by the Municipal Health Secretariat of the municipality where the study took place and the Research Ethics Committee of the Univates University Center, under Approval No. 997.286. The study complied with the ethical criteria established by Resolution No. 466, of December 12, 2012, of the National Health Council[14], which defines the guidelines and regulatory standards for research involving human beings.

RESULTS

Of the 350 people with DM, the majority (n=238; 68.0%) were women and their mean age was 64.4 (±11.2) years. The age range with the highest prevalence was that of people aged 60-69 years, with a percentage of 36.6% (n=128). Regarding marital status, the majority (64.9%) were married. Most people had incomplete primary education (68.6%; n=240), 11.7% (n=41) of the population could not read or write, and only 0.3% (n=1) had a higher education degree.

With regard to occupation, 75.2% (n=241) were retired or pensioners, 9.7% (n=34) were homemakers, and 4% were self-employed (n=14). White skin color was prevalent in 85.7% (n=300) of the people with DM. As for the monthly household income, 21.7% (n=76) of the participants earned up to one wage, 46% (n=161) earned from one to two wages, 28.6% (n=100) earned from two to four wages, and 3.7% (n=13) earned from four to 10 wages.

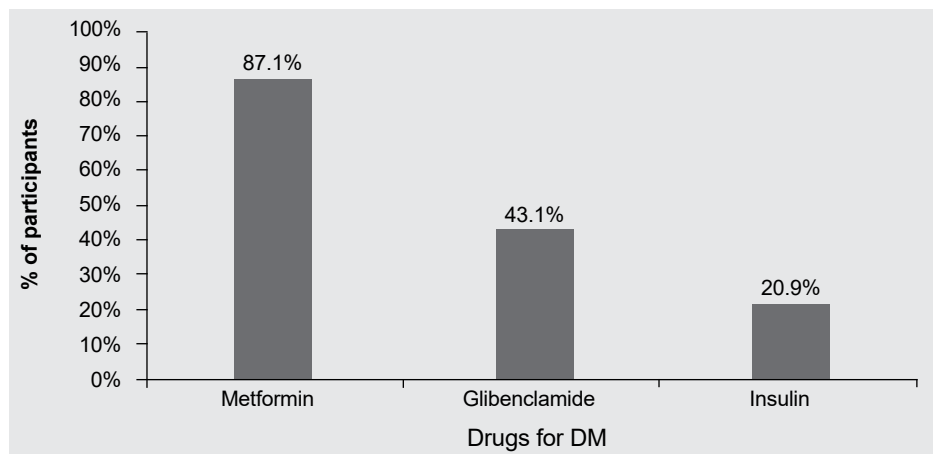The identification of the drugs used will be shown in Figure 1.

Figure 1 - Drugs used by people served by the Family Health Strategies (*Estratégias Saúde da Família - ESF*) for the treatment of diabetes mellitus (DM). Lajeado, Rio Grande do Sul, Brazil, 2015.

We also found that the participants take drugs for other associated diseases, the most common being simvastatin, followed by acetylsalicylic acid (ASA), enalapril and hydrochlorothiazide (Figure 2). There was also a lower prevalence of use of other drugs by this population, including amlodipine, diazepam, digoxin, metropolol, atenolol, sertraline, clonidine, carbamazepine, isosorbide and amiodarone.
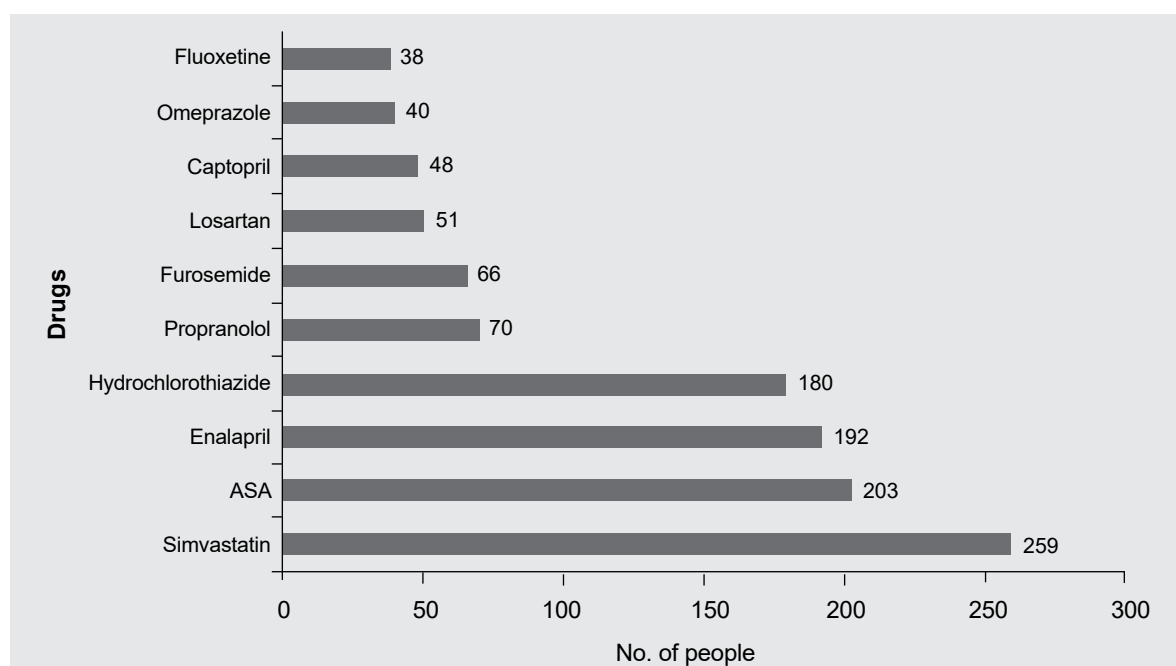

Figure 2 - Drugs mostly used for other diseases associated with people with diabetes mellitus served by the Family Health Strategies (*Estratégias Saúde da Família - ESF*). Lajeado, Rio Grande do Sul, Brazil, 2015.

The analysis of adherence to drug treatment in the sample by the MAT Questionnaire showed that the sample's mean adherence was 5.56 (± 0.49) on a scale scored from 1 to 6. A total of 86.9% of the sample adhered to the treatment and 13.1% did not exhibit satisfactory adherence to drug treatment.

In assessing QoL through the WHOQOL-bref questionnaire, we found that the overall mean QoL was 67.6 (±18.1), that is, the participants had a good QoL. Even after dividing the sample into groups that adhered and did not adhere to drug treatment, both groups showed good QoL, with 68.6 (±15.9) and 60.9 (±14.2), respectively, and statistical difference in QoL (t=3.3162; p=0.0012).

DISCUSSION

Adherence to drug treatment by people with diabetes mellitus is a valuable indicator for assessing the effectiveness of diabetes care, as it has clinical relevance for health professionals, making it possible to direct clinical decision-making in relation to the treatment of diabetes within the ESF team[15].

As for drug treatment, most participants in the present study used metformin (87.1%). The second most used medication was glibenclamide (43.1%), and 20.8% of the participants used insulin. These findings are in line with other studies in Southern Brazil, in which the most widely used drugs were the same as those in the present study, with insulin always being the least used in the studies[16,17].

The Plan for the Reorganization of Care for Arterial Hypertension and Diabetes Mellitus promoted the restructuring and expansion of effective and quality care for people with these conditions. Thus, the Ministry of Health has adopted essential drugs as a treatment of DM, as recommended by the World Health Organization (WHO), with oral hypoglycemic agents, such as glibenclamide, in 5 mg tablets, and metformin, in 850 mg tablets, in addition to the NPH 100IU insulin, available in the Brazilian health system on a systematic and cost-free basis[18].

People with DM in this study also used drugs for other associated diseases. The drugs that most people used were simvastatin, followed by ASA, enalapril and hydrochlorothiazide, which are used to treat dyslipidemia, cardiovascular disease, and hypertension. These factors, commonly associated with DM, can be controlled[2]. A study carried out in a municipality in the countryside of Bahia on the use of medicines and lifestyle in the management of DM in older adults showed that 70% of the individuals analyzed were hypertensive and used medication for such pathology[19].

Regarding the adherence to drug treatment by people with DM served by the ESF (MAT questionnaire) in the present study, we found that the majority of the people analyzed in the present study adhered to the treatment (86.9%). A study conducted in Minas Gerais with patients with type 2 DM served by ESF found adherence to drug treatment above 60% in all ESF analyzed[15]. Other national studies carried out with samples of people with DM also found good adherence to drug treatment, respectively, 78.3% and 97.6%[1,16].

In the present study, the mean value found for adherence to drug treatment was 5.56 on a scale of 1 to 6, in which higher scores indicate greater adherence. Therefore, it is observed that the mean value is close to the maximum possible value, and it can be said that the analyzed sample has a good drug adherence. Positive adherence to drug treatment may be related to the perceptions and beliefs people with DM have about their treatment. Treatment consists of three modalities: medication, diet, and exercise; however, generally, people consider medication to be the most important type of treatment for DM control[20].

Therefore, the high percentages are linked to the acceptability of drug treatment and the belief in the effect of the drug to control the disease[20]. This evidence may also be related to the policy of distributing medicines free of cost through the health system, which guarantees their accessibility[3,21].

Other studies report that one of the biggest challenges encountered by health professionals is the low adherence to treatment, including drug treatment, by people with diabetes[19,22]. These data do not corroborate the findings of the present study. It should be noted that the MAT questionnaire contains questions that refer to the proper use of medication, time, quantity, reason for not taking it, etc., in the period of the last seven days, and gives the possibilities for answering each question[13,23].

In comparing the mean QoL of people with DM and adherence to drug treatment, we found a significant difference between the mean QoL of people who adhered to the treatment and the mean of those who did not adhere to the treatment in the present study. This allows us to infer that people who adhere to drug treatment have better QoL than those who do not adhere to treatment. Low adherence to drug treatment is one of the primary reasons for reducing the clinical stability of people with DM and contributes to the emergence of health and psychosocial complications, which reduce the QOL of individuals. Thus, considering the evidence in this study that people who adhere to drug treatment have a better QoL than non-adherents, it is necessary that the multidisciplinary teams of the ESF develop

educational actions[23,24]. These teams need to cover the correct use of drugs used for the treatment of DM, especially with the aim of guiding people who have some type of difficulty in adhering to drug treatment[25,26].

Health professionals should promote health education aimed at improving DM patients' understanding of the importance of QoL and adherence to all treatment. Professionals need to take into account that low adherence is linked to resistance to changes in lifestyle and individuals' difficulty to understand and adapt to drug treatment[27]. It is considered important to highlight that non-adherence to DM treatment cannot be observed only as the person's incompetence to follow treatment properly, as it should also be seen as a possible failure of the health system to offer adequate care to patients according to their singularities[20,27].

It is recommended that the therapeutic plan of the person with DM be built with the subject's active participation. It is necessary to establish a relationship of trust and credibility between professional and user by offering individualized and multi-professional care. Thus, the individual will feel more motivated to the treatment and be persistent in it. In this perspective, health education practices occupy important spaces since they can contribute to raising awareness of people with DM about pharmacological adherence and the adaptation of their habits and behavior[4,7,28].

It is understood that one limitation of the present study was the analysis of only one municipality in the state of Rio Grande do Sul, which may limit the generalization of the results obtained. In addition, limitations may arise from the cross-sectional design, in which the collection of data on exposure and outcome occurs in a single moment.

However, the impact of this study is reflected in the construction of evidence on the treatment of DM, which aims to maintain glycemic control, promote health, and improve the quality of life of individuals. Thus, it is essential that people affected by this chronic disease perform the drug treatment properly and, consequently, can reduce the adversities during therapy and prevent the disease from worsening and possible complications resulting from it[28-30].

CONCLUSION

After analyzing adherence to drug treatment and its relationship to the quality of life of people with diabetes, we found that the population of this study positively adheres to drug treatment related to disease control. The overall mean quality of life was good and significantly higher in those who adhered to drug treatment.

ACKNOWLEDGEMENTS

CONTRIBUTIONS

Claudete Morechi and **Claudete Rempel** contributed to the study conception and design; acquisition, analysis and interpretation of data; and writing and/or revision of the manuscript. **Dirce Stein Backes**, **Carmen Neri Fernández Pombo**, **Luís Felipe Pissaia** and **Daiana Foggiato de Siqueira** contributed to the acquisition, analysis and interpretation of data; and writing and/or revision of the manuscript. All the authors approved the final version of the manuscript and are responsible for all aspects, including ensuring its accuracy and integrity.

REFERENCES

1. Sociedade Brasileira de Diabetes. Diretrizes da Sociedade Brasileira de Diabetes 2017-2018. São Paulo: Editora Clannad; 2017.

2. World Health Organization. Diabetes [Internet]. Geneva: WHO; 2013 [accessed on 2017 July 19]. Available from: www.who. int/topics/diabetes_mellitus/en

3. Greghi EFM, Pascon DM. Knowledge of diabetes mellitus type 2 patients inserted into the adult health care program. Rev Fac Ciênc Méd Sorocaba [Internet]. 2016 [accessed on 2017 June 26];18(4):204-9. Available from: https://www.researchgate.net/publication/313231779_Conhecimento_dos_pacientes_portadores_de_diabetes_mellitus_tipo_2_inseridos_no_Programa_de_Saude_ao_Adulto

4. Costa KS, Tavares NUL, Mengue SS, Pereira MA, Malta DC, Silva JB Jr. Obtaining drugs for hypertension and diabetes through the Brazilian People's Pharmacy Program: results of the National Health Survey, 2013.

Epidemiol Serv Saúde [Internet]. 2016 [accessed on 2017 Aug 10];25(1):33-44. Available from: http://www. scielo.br/pdf/ress/ v25n1/2237-9622-ress-25-01-00033.pdf

5. Ministério da Saúde (BR). Plano de reorganização da atenção à hipertensão arterial e ao diabetes mellitus [Internet]. Brasília: Ministério da Saúde; 2002. [accessed on 2016 Aug 10]. Available from: http://bvsms.saude. gov.br/bvs/publicacoes /miolo2002.pdf

6. Dutra DD, Duarte MCS, Albuquerque KF, Lima AS, Santos JS, Souto HC. Cardiovascular disease and associated factors in adults and elderly registered in a basic health unit. Rev Pesqui (Univ Fed Estado Rio J) [Internet]. 2016 [accessed on 2016 Aug 08];8(2):4501-9. Available from: http://search.ebscohost.com/login.as px?direct=true&db=foh&AN=114759934(=pt-br&site=eds-live

7. Alves MS, Araújo MDCF, Nascimento MP, Ribeiro FC, Rebouças PT, Santos TA, et al. Grupo Terapêutico com idosos sobre o autocuidado nas doenças crônicas. J Health Sci [Internet]. 2016 [accessed on 2017 June 18];18(1):52-5. Available from: http://pgsskroton.com.br/seer/index.php/JHealthSci/article/viewFile/3515/3107

8. Machado JC, Cotta RMM, Moreira TR, Silva LSD. Analysis of three health education strategiesfor patients with arterial hypertension. Ciênc Saúde Colet [Internet]. 2016 [accessed on 2017 June 18];21(2):611-20. Available from: http:// www.scielo.br/scielo.php?script=sci_arttextπrd=S1413-81232016000200611

9. Lima TAM, Fazan ER, Pereira LLV, Godoy MF. Acompanhamento farmacoterapêutico em idosos. Arq Ciênc Saúde [Internet]. 2016 [accessed on 2017 June 18];23(1):52-7. Available from: http://www.cienciasdasaude. famerp.br/index. php/racs/article/view/229/176

10. The WHOQOL Group. The World Health Organization quality of life assessment (WHOQOL): position paper from the World Health Organization. Soc Sci Med. 1995;41:1403-9.

11. Fleck MPA. O instrumento de avaliação de qualidade de vida da OMS (WHOQOL-100): características e perspectivas. Ciênc Saúde Colet [Internet]. 2000 [accessed on 2017 June 18];5(1):33-8. Available from: http:// www.scielo.br/ pdf/csc/v5n1/7077.pdf

12. Instituto Brasileiro de Geografia e Estatística. XII Censo Demográfico [Internet]. 2010 [accessed on 2017 Mar 12]. Available from: http:www.ibge.gov.br

13. Delgado AB, Lima ML. Contributo para validação concorrente de uma medida de adesão aos tratamentos. Psicol Saúde Doenças [Internet]. 2001 [accessed on 2016 June 18];2(2):81-100. Available from: http://www. scielo.mec.pt/scielo.php?script=sci_arttext&pid=S1645-00862001000200006

14. Ministério da Saúde (BR). Diretrizes e normas regulamentadoras sobre pesquisa envolvendo seres humanos: resolução 466. Brasília: Ministério da Saúde; 2012.

15. Faria HTG, Santos MA, Arrelias CCA, Rodrigues FFL, Gonela JT, Teixeira CRS, et al. Adesão ao tratamento em diabetes mellitus em unidades da Estratégia Saúde da Família. Rev Esc Enferm USP [Internet]. 2014 [accessed on 2017 June 18];48(2):257-63. Available from: http://www.scielo.br/pdf/reeusp/v48n2/pt_0080-6234-reeusp-48-02-257.pdf

16. Carvalho CV, Rocha LP, Carvalho DP, Silva BT, Oliveira SM, Silveira RB. Adesão de pessoas com diabetes mellitus tipo II ao tratamento medicamentoso. Rev Enferm UFPE. 2017 [accessed on 2017 June 18];11(9):3402-9.

17. Silva AB, Engroff P, Sgnaolin V, Ely LS, Gomes I. Prevalência de diabetes mellitus e adesão medicamentosa em idosos da Estratégia Saúde da Família de Porto Alegre/RS. Cad Saúde Colet. 2016;24(3):308-16.

18. Ministério da Saúde; Organização Pan-Americana da Saúde. Avaliação do Plano de Reorganização da Atenção à Hipertensão Arterial e ao Diabetes Mellitus no Brasil. Brasília: Ministério da Saúde; 2004.

19. Santos-Souza A, Cardoso-Santos IS, Campos-Meira E, Oliveira BBC, Souza-Júnior EV. Uso de medicamentos e estilo de vida no gerenciamento do diabetes em idosos. Rev Salud Pública. 2019;21(3)1-7.

20. Boell JEW, Silva DMGVD, Guanilo MEE, Hegadoren K, Meirelles BHS, Suplici SR. Resiliência e autocuidado em pessoas com diabetes mellitus. Texto & Contexto Enferm. 2020;29.

21. Farias EBO, Espinheira MJCL, Santana NRS, Rodrigues RLA. Adesão terapêutica em pacientes diabéticos em uso medicamentoso. Rev Psicol. 2019;13(43)407-15.

22. Borba AKOT, Marques APO, Ramos VP, Leal MCC, Arruda IKG, Ramos RSPS. Fatores associados à adesão terapêutica em idosos diabéticos assistidos na atenção primária de saúde. Ciênc Saúde Colet. 2018;23(3):953-61.

23. Salin AB, Bandeira MSN, Freitas PRNDO, Serpa I. Diabetes Mellitus tipo 2: perfil populacional e fatores associados à adesão terapêutica em Unidades Básicas de Saúde em Porto Velho-RO. Rev Eletrônica Acervo Saúde. 2019;(33).

24. Reis P, Marcon SS, Nass EMA, Arruda GO, Back IR, Lino IGT, et al. Desempenho de pessoas com diabetes mellitus na insulinoterapia. Cogitare Enferm. 2020;25.

25. Silva AD, Matos N Jr, Damasceno DD, Guimarães NS, Gomes JMG. Estado nutricional, fatores de risco e comorbidades em adultos portadores de diabetes mellitus tipo 2. HU Rev. 2020;46:1-9.

26. Marcelo CAS, Coutinho MAP, Lara CR, Paraizo CMS, Fava SMCL. Aplicativos móveis sobre diabetes mellitus-Revisão Narrativa. J Health Inform. 2020;12(2).

27. Nogueira BCM, Souza CAD, Manzano RM, Rosa CSDC, Barrile SR, Ximenes MA, et al. Aspectos emocionais e autocuidado de pacientes com Diabetes Mellitus Tipo 2 em Terapia Renal Substitutiva. Cad Bras Ter Ocup. 2019;27(1):127-34.

28. Campos LS, Silva CB, Wanderley TLR, Candeia VMM, Calzerra NTM. A prática da atenção farmacêutica no acompanhamento farmacoterapêutico de idosos diabéticos e hipertensos: relato de caso. Braz J Health Rev. 2020;3(2):2287-96.

29. Santos WP, Silva MM, Freitas FBD, Souza FT. Interfaces da (não) adesão ao tratamento do diabetes mellitus tipo II. Rev Ciênc Saúde Nova Esperança. 2019;17(2)56-63.

30. Maia L, Lopes RR, Tomazetti D, Alves MM, Mariño PAP, Menezes APS. Polifarmácia: avaliação em grupo de hipertensos e diabéticos. Salão Int Ensino Pesqui Extensão. 2019;11(2).

Mailing address:
Claudete Moreschi
Universidade Regional Integrada do Alto Uruguai e das Missões - Campus Santiago
Av. Batista Bonoto Sobrinho, 733
CEP: 97700-000 - Santiago (RS) - Brasil
E-mail: clau_moreschi@!yahoo.com.br