ORIGINAL ARTICLE

Factors associated with alcohol health literacy among patients with diabetes assisted by primary health care

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Declaration of interests: nothing to declare

ABSTRACT

Introduction: The drinking habit is an important factor of metabolic imbalance among people with diabetes. However, individuals with higher levels of health literacy can perform behaviors that create barriers to the emergence of complications of this disease. Checking the health reading related to the drinking habit can be useful to reduce the consequences of diabetes. **Objective:** To identify the factors associated with health literacy related to the addiction among people with diabetes assisted by primary health care. **Methods:** Cross-sectional study conducted in health units in the city of Montes Claros, MG, Brazil. Demographic and economic conditions were analyzed, in addition to the levels of health literacy assessed from the instrument Alcohol Health Literacy. **Results:** The study included 215 people with diabetes with a mean age of 60.73 years, mostly women (63.7%; n=137). Lower levels of alcohol health literacy were present in 31.2% (n=67) of the participants. The following variables were associated with lower levels of health literacy: sex (men, OR 0.46; 95%CI 0.23-0.94; p=0.032), low schooling (early childhood education, OR 7.00; 95%CI 2.55-19.20; p<0.001; illiterate, OR 28.06; 95%CI 4.40-178.83); and spending on diabetes-related drugs (OR 2.27; 95%CI 1.14-4.50; p=0.019). **Conclusion:** There were better levels of health literacy related to the habit of alcohol use among men, with higher education and who did not have spending on diabetes-related drugs.

Keywords: Health literacy; Diabetes mellitus; Alcoholism; Family Health Strategy; Primary Health Care.

INTRODUCTION

Health literacy refers to the cognitive and social ability of the human being to access, understand, judge and apply knowledge in their routine for the maintenance of their health condition. It can still be understood as a behavior change that creates obstacles to the development of complications of non-communicable diseases, such as diabetes mellitus[1]. This disease is defined as a cluster of metabolic changes caused by insufficient production or poor function of insulin, generating increased blood glucose. Late diagnosis is commonly associated with complications installed[2], making the adoption of healthy lifestyle habits even more necessary[3].

The drinking habit stands out as an important factor of metabolic imbalance in people with diabetes[4]. Alcohol can act on the central nervous system[5] and modify the individual's judgment regarding the maintenance of food consumption and healthy practices. It can also interfere with the action of insulin, increasing the risk of glycemic uncontroll[6,7]. People with a drinking habit may be more resistant to treatment due to lack of understanding and memorization of instructions given by the health team[8]. In this sense, individuals with diabetes are co-responsible for their treatment and must act actively in their maintenance through habits and self-care actions[9,10]. Higher levels of health literacy can offer protective barriers to complications, since the patient practices daily self-care[11,12].

Verifying alcohol health literacy and its associated factors among individuals with diabetes may be useful for the development of prevention policies in order to reduce the consequences of this disease. This study aimed to identify factors associated with lower levels of alcohol health literacy among patients with diabetes assisted by primary health care.

METHODS

Cross-sectional observational study with quantitative analysis conducted between 2018 and 2020 with users of Family Health Strategy units in Montes Claros, Minas Gerais, Brazil. The city of Montes Claros is located in the north of Minas Gerais, being considered the sixth largest in the state in population. It has an area of 3,589.811 km^2 and had a human development index of 0.770 in 2010. In 2022, its population was estimated at 413,487 inhabitants[13].

Three basic family health units were selected by simple random selection among the 73 units present in the city. The lists of all people with diabetes registered were asked for simple random selection of participants. People aged 18 years or older and diagnosed with diabetes (type I or type II) were included in the study, according to information from the unit itself. People with three or more comorbidities, who did not have Portuguese as their native language, demonstrated difficulties or visual and/or auditory problems reported or observed by the researchers during the interviews[1] were excluded. The list provided included 507 people with diabetes.

A probabilistic sample for infinite population was estimated, defining the following parameters in the sample planning: people with diabetes with lower levels of health literacy (proportion of 50%); confidence level (95%); sampling error (5%); losses (increase of 10%). Thus, a sample of 241 participants was considered.

The following variables were evaluated: a) Demographic and economic conditions: sex (female; male); age group (in years) (categorized by quartiles for a homogeneous distribution of the variable: 22 to 54; 55 to 61; 62 to 68; 69 to 98); education (in years) (college; high school; elementary school; early childhood education and illiteracy); self-reported race or color (white; yellow; black; brown; indigenous); marital

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status (single; married; stable union; widowed; divorced; separated); occupational status (with work; without work; retired); spending on medicines related to diabetes (no; yes; if yes, how much); per capita income (up to 1,045.00 BRL; above 1,045.00 BRL [minimum wage in the year of the study]); b) Health literacy measured by the instrument Alcohol Health Literacy (AHL) (higher or lower levels). Values ≤ 14 determine lower levels of health literacy[14].

The approach took place in the participants' home, being the initial contact made by a community agent through invitation. The instruments were presented and applied in the interview format after consent to participate in the investigation. A quiet and reserved place was sought.

A questionnaire with questions related to demographic and economic conditions was applied. Subsequently, the level of health literacy was evaluated through the AHL. This instrument has 18 trios of words related to access and knowledge of factors associated with the drinking habit. To define the level of health literacy, a main term must be associated with one of the other two words in each trio. The final score can vary from zero to 18, because one point (01) is added to each correct association. Values similar to or lower than 14 suggest lower levels of health literacy[14]. Printed plates were used while applying the AHL.

The main terms were located at the top of the plates highlighted in bold and below were the other two words of association with equal sizes and fonts. The main term was read aloud by the interviewer, then the participant was asked which word was correctly associated with the main term, which was also read for the illiterate. Participants were instructed in advance to say "I don't know" to avoid guesswork in situations where they did not know the answer.

Theoretical and practical training was conducted with the interviewing researchers to reduce the measurement bias and reduce the intrinsic subjectivity of the interviews; people with diabetes who participated in this training did not make up the final study sample.

Statistical Package for the Social Sciences version 24.0 was used. Descriptive analysis was used in categorical variables, estimating absolute and relative frequencies. Mean, standard deviation (SD), 95% confidence interval (95%CI) and minimum and maximum values were estimated in the continuous variables. The appropriate test to the distribution of normality of the sample was chosen: Pearson or Spearman correlation; the choice of this correlation was defined through the statistical test of normality (Kolmogorov-Smirnov tests), applying a significance level of 5%. The chi-square test was applied to identify associations between the dependent variable (alcohol health literacy: higher levels; lower levels) and the independent ones, also obtaining the odds ratio and its statistical significance, in addition to the 95%CI. Multiple variables that obtained $p \leq 0.20$ in the univariate analysis were included in the analysis. Multiple models were estimated through logistic regressions, maintaining the variables associated with $p < 0.05$ in the final model.

The work was approved by the Research Ethics Committee of the State University of Montes Claros through opinion 1.461.818. All participants signed the informed consent form.

RESULTS

The invitation was sent to 241 individuals with diabetes. Among these, 12 refused to participate and 14 did not answer the AHL instrument completely. Therefore, 215 people participated in the study, a response rate of 89.2% (Figure 1).

Most were women (63.7%; n=137) with a mean age of 60.73 years (SD 11.31; 95%CI 59.20-62.25; minimum value 22; maximum value 98). The average per capita income was R$ 811.47 (SD 744.40; 95%CI 718.99-913.06; minimum value R$ 0.00; maximum value R$ 4,000.00). The average level of education was 7.67 (SD 4.33; 95%CI 7.10-8.23) and the average amount spent on diabetes-related drugs was R$ 67.47 (SD 129.52; 95%CI 51.19-85.4; minimum value R$0.00; maximum value R$1,000). Lower AHL levels were found among 31.2% of participants (n=67; mean=15.18; SD 2.94; 95%CI 14.79-15.56; minimum value 5; maximum value 18) (Table 1).

The variables age (p=0.043 [55 to 61 years]; p=0.001 [69 to 92 years]) and education (p<0.001 [early childhood education]; p=0.001 [illiterate]) were associated with lower AHL levels in the univariate analysis (Table 1). Variables that were associated with the dependent variable with the p-value ≤0.20 (sex; age; schooling; self-reported race or color; marital status; occupational status; and spending on diabetes-related drugs) were considered in the multiple model.

Lower levels of AHL were observed among those with lower education (early childhood education OR 7.00; 95%CI 2.55-19.20; p<0.001; illiterate, OR 28.06; 95%CI 4.40-178.83; p<0.001) and with spending on medicines (OR 2.27; 95%CI 1.014) and better levels among men (OR 0.46; 95%CI 0.23-0.94; p=0.032) (Table 2).

DISCUSSION

This investigation showed that sex, education and spending on diabetes-related drugs might be associated with lower levels of health literacy among people with diabetes assisted by primary health care in a medium-sized city in northern Minas Gerais. This result highlights the need to consider strategies to encourage self-care among primary care users so that they become active and interested in personal care in general, whether through collective or individual actions[15]. These actions are intensified when people are adequately informed about their treatment[16]. In this sense, health literacy can be a useful tool to make the individual aware of the care of their lifestyle, providing them with the ability to understand and judge as necessary the change of behaviors to prevent complications[17].

Studies have shown the variable sex as a factor associated with health literacy[18-20]. Research conducted in Ghana identified higher levels of health literacy among men[20]. This difference is possibly explained because the habit of alcoholism is more prevalent among men; this way, this public can present greater knowledge before specific questionnaires that analyze different aspects about the alcohol health literacy[21], in addition, these variables may be influenced by other interconnected factors, such as such as education[20].

Lower levels of AHL were associated with lower levels of education, a result similar to previous studies conducted in Portugal[22] and in Brazil, in the states of Pará[23] and Minas Gerais[18,24]. A study conducted in primary health care found that adults with primary and secondary education showed, respectively, 22.06 and 4.20 times more chances of presenting lower levels of health literacy when compared to those with higher

education[18]. School education can contribute to increase understanding of the importance of healthy lifestyle habits, which facilitates the adoption of beneficial health behaviors.

Study conducted in the state of Minas Gerais among users of primary health care showed that income is an important factor in the process of health literacy, which is due to its connection with the social status that this variant guarantees to the individual and that encompasses various areas such as employment, the type of work performed and, consequently, whether access to health insurance is facilitated[25]. Vulnerable individuals in the social and economic context have greater difficulties in accessing health services and receiving information necessary for their well-being, which corroborates unsatisfactory clinical outcomes and an impaired health understanding. In addition, the income factor is responsible for the access or not to medicines, since not every drug is offered by the Unified Health System. Such factors might be related to the result found in this study, in which drug spending was associated with lower levels of AHL; a result also observed in patients with diabetes in a study conducted in São Paulo[26]. Despite this, there were no justifications in the literature to explain this finding.

It was not possible to make direct observations of self-care actions related to the drinking habit among the participants, being considered a limitation in this study. However, the study allowed discriminating different levels of reading and identifying the associated factors. Further investigations should be conducted in order to demonstrate complementary results.

The study revealed better levels of alcohol health literacy among men, with higher education and who did not have spending on medicines related to diabetes. It highlights the need for effective health actions developed from easy-to-understand methods that are directed to change and maintain patient behavior

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Figure 1: Process of selection of the study participants.

73 health units present in the city

Three units selected by simple random selection

241 potential participants were selected through simple random selection from a list containing 507 people with diabetes

12 people refused to participate and 14 did not answer completely the instrument Alcohol Health Literacy

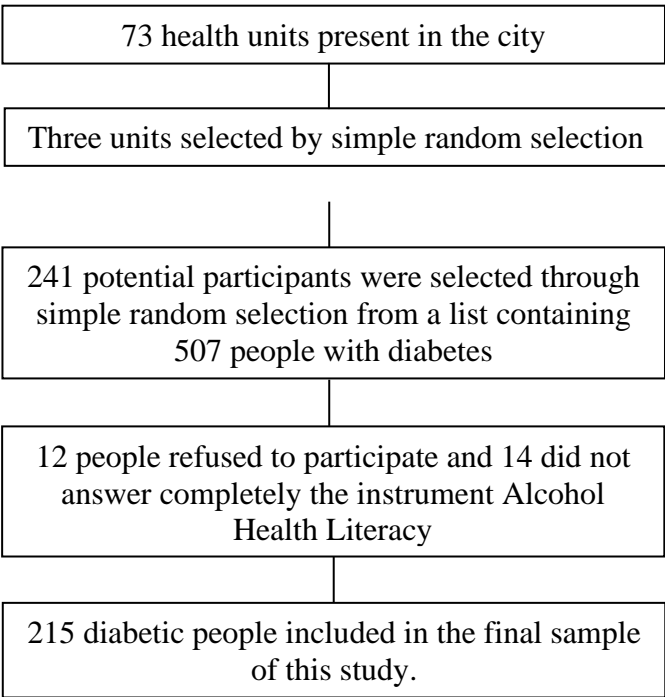| 215 diabetic people included in the final sample of this study. |
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Table 1: Univariate analysis of independent variables according to alcohol health literacy, Montes Claros, MG, Brazil. 2020. (n=215).

Variable	N	%	Alcohol health literacy				
			Higher levels	Lower levels	OR	95%CI	p-value[a]
Sex							
Female	137	63.7	88	49	1		
Male	78	36.3	60	18	0.54	0.29-1.01	0.055
Age							
22 - 54	57	26.5	47	10	1		
55 - 61	55	25.6	36	19	2.48	1.03-5.98	**0.043**
62 - 68	53	24.7	39	14	1.69	0.67-4.22	0.263
69 - 92	50	23.3	26	24	4.34	1.80-10.45	**0.001**
Education							
College	44	20.5	37	7	1		
High school	39	18.1	35	4	0.60	0.16-2.24	0.452
Elementary school	67	31.2	47	20	2.25	0.86-5.89	0.099
Early childhood education	56	26.0	27	29	5.68	2.17-14.87	**<0.001**
Illiterate	9	4.2	2	7	18.50	3.16-108.28	**0.001**
Self-reported color or race							
Yellow/black/brown/indigenous	144	67.0	95	49	1		
White	71	33.0	53	18	0.66	0.35-1.24	0.198
Marital status							
With partner	137	63.7	100	37	1		
Without partner	78	36.3	48	30	1.69	0.93-3.05	0.083
Occupational situation[b]							
With work	64	30.5	47	17	1		
Without work	60	28.6	37	23	1.72	0.80-3.68	0.163
Retiree	86	41.0	60	26	1.20	0.58-2.46	0.623
Spending on medicines							
No	107	49.8	78	29	1		
Yes	108	50.2	70	38	1.46	0.82-2.61	0.202
Per capita income[b]							
Above 1,045.00 BRL	34	16.9	26	8	1		
Up to 1,045.00 BRL	167	83.1	113	54	1.55	0.66-3.66	0.314

a) chi-square test: significant $p<0.05$.

b) number of respondents lower than the number of participants, due to refusal to answer this variable.

Table 2: Final multiple model of factors associated with lower levels of alcohol health literacy, Montes Claros, MG, Brazil. 2020. (n=215).

Variable	OR	95%CI	p-value
Sex			
Female	1		
Male	0.46	0.23-0.94	**0.032**
Education			
College	1		
High school	0.64	0.17-2.43	0.513
Elementary school	2.32	0.87-6.22	0.094
Early childhood education	7.00	2.55-19.20	**<0.001**
Illiterate	28.06	4.40-178.83	**<0.001**
Spending on medicines			
No	1		
Yes	2.27	1.14-4.50	**0.019**

Hosmer-Lemeshow - X^2=4.058; p-value=0.773.