Original Paper

The Effectiveness of Information in Diabetes Mellitus Treatment Adherence

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Abstract

Background: Diabetes Mellitus (DM) is characterized by deficiencies in insulin action and secretion, and difficulties in regulating hepatic glucose production, which may lead to significant complications. Our aim was verify if DM carriers that are recipients of communication actions have a better adherence to treatment, and, consequently, a better control of the disease. Methods: It is a quantitative study of descriptive nature. The research was conducted in a diabetes association, and the sample consisted of 112 individuals who participated in the National Diabetes Campaign, promoted by this institution. A questionnaire consisting of 56 questions was used and was divided in three parts: Demographics; level of knowledge of the disease; and communication participation. Data was processed and analyzed using the statistical software EpiInfo, version 7.2. Results: 82.1% of the sample are in the 60 to 85 age group, 56.2% are females; 31.3% had 1 to 4 years of schooling and 30.3% are employed. It was found that 21.4% frequent AD (Diabetes Association) and the main mentioned complications of DM were: amputation; blindness and kidney problems. It was evidenced that attending an AD is correlated with better glycated hemoglobin results (HbA1c ≤ 7%). Conclusion: It is highlighted that DM carriers who are recipients of communication actions have a better adherence to treatment, and, consequently, a better control of the disease.

Keywords

Diabetes mellitus, adherence, education, communication

1. Introduction

In 2014, the world population with Diabetes Mellitus (DM) was estimated at 387 million, forecasting 471 million by 2035. This increase is related to population growth and aging, increase in obesity rates, a more sedentary lifestyle, as well as to the greater survival of DM patients. In Brazil, for the same year, it was estimated that there were 11.9 million people with DM, in the age group of 20 to 79 years, and that this number could reach 19.2 million by 2035 (International Diabetes Federation, 2014). According to the World Health Organization, DM will be the second largest cause of mortality in Latin America over the next 20 years (Global status report on noncommunicable diseases, 2010).

Type 1 DM is characterized by the destruction of beta cells that lead to insulin deficiency, involving genetic and environmental factors. Among the potential environmental factors for triggering autoimmunity in genetically predisposed individuals are certain viral infections and nutritional factors. Type 2 DM is characterized by the deficiency in the action and secretion of insulin and regulation of hepatic glucose production (Diretrizes da Sociedade Brasileira de Diabetes, 2015-2016).

The clinical manifestations of DM are: hyperglycemia, glycosuria, polyuria, polydipsia, polyphagia, fatigue, weakness and weight loss. Plasma glucose values between 70-99 mg/dl are considered normal (Silveira, Ramos, Freitas, Rodrigues, de Brito, Serafim, & Bezerra, 2015). DM treatment consists of normalizing plasma glucose levels in an attempt to reduce the development of vascular and neuropathic complications (Silva, Budó, Garcia, Simon, & Rosso, 2013).

For better DM control, strategies related to education, lifestyle modifications, including smoking cessation, increased physical activity and reorganization of eating habits, and use of medications, may be used. For these strategies to be put into practice, communication is necessary. Communication is the mean through which people interact with each other, by sending and receiving messages, being put into effect by the process of understanding the message between the sender and the receiver (Stefanelli, 2005). The process of communication consists not only of the linear movement from a source to the receiver, but in the sharing of ideas, attitudes, and emotions (Hyndman, 1995).

Considered to be a complex disease, DM requires changes in the lifestyle and daily behavior of people affected by it. For this reason, specialized communication in health and the promotion of this disease among DM carriers and health professionals contribute to finding the safest way to deal with the difficulties imposed by the disease, improving of the quality of life (Paes, 2001).

It is of great importance that health professionals understand the complexity of the determinant factors of this process. Therefore, the general objective of this study was to verify if DM patients who participate in communication actions have a better adherence to treatment, and, consequently, a better disease control.

2. Materials and Method

This is a quantitative study of descriptive nature. The research was conducted in a nationally renowned, philanthropic and non-profit diabetics association. The sample consisted of 112 individuals who participated in the National Diabetes Campaign, promoted by this institution. As inclusion criterion, the following participants were selected: patients with types 1 and 2 DM, over 18 years old, who were diagnosed at least two years ago and who voluntarily accepted to participate in the study. Participants with gestational DM and DM carriers who were part of the professional staff that participate in communication actions of the institution surveyed were excluded.

After receiving the administrative authorization to execute the research and the approval of the Ethics Committee (Protocol No. 1.539.979), personal contact with the participants of the National Diabetes Campaign was made to present the project.

For data collection it was used a questionnaire consisting of 56 structured and semi-structured questions, elaborated to answer the objectives proposed for this research. The questionnaire is divided in three parts. The first one consists of identification variables of the study subjects; the second of variables that assess the degree of knowledge of the disease, such as type of diabetes, pathophysiology, control, treatment and complications (International Diabetes Federation, 2014; Diretrizes da Sociedade Brasileira de Diabetes, 2015-2016) and the third of variables that are related with communication.

Data was processed and analyzed using the statistical software EpiInfo, version 7.2. In the descriptive analysis, the qualitative variables were presented in relative and absolute frequency and the quantitative ones by measures of central tendency and dispersion. Univariate parametric and non-parametric analyzes were performed; used the chi-square test by the Mantel-Hanszel tests and the Fisher's exact test when not valid chi-square. In the parametric analysis, the mean differences were performed by the Mann-Whitney/Wilcoxon test, since the variances were not homogeneous. Significance level was considered at 5% ($p \leq 0.05$).

3. Results

112 people with Diabetes mellitus were interviewed; the descriptive results and the univariate analysis tests are presented below.

A mean age of 66.1 years, with young people in the group (minimum of 26 years) was observed (Table 1). However, Figure 1 shows a higher concentration amongst older ages, 82.1% aged between 60 and 85 years. In relation to gender, 56.2% were women. In regards to social variables, there was an average of 8.2 years of study, highlighting that 31.3% of the participants had one to four years of schooling and 30.3% had a paid work activity.

Table 1. Frequency, Measures of Central Tendency and Dispersion of Variables According to Gender, Age and Social Characteristics of Individuals with Diabetes Mellitus (S ão Paulo, 2015)

Variable		N	%	medium	median	±	SD
Age	26-59	20	17.9	66.1	67	26/85	9.868
	60-85	92	82.1				
schooling *	1 4	35	31.3	8.2	8	1/16	3.942
(years of study)	5 9	35	31.3				
	10 16	41	37.4				
Gender	male	49	43.8				
	female	63	56.2				
	housewife	23	20.5				
employment situation *	retired	54	48.2				
	paid work	34	30.3				

* Excludes ignored data.

Table 2 shows the results observed on health conditions in sampled diabetes carriers, as well as how they attempted to control this disease, highlighting that there were referred information, except the result of the hemoglobin glycated (HbA1c) test. About the sample, 70.5% reported having type 2 diabetes; 78.6% use oral antidiabetic and 20.6% subcutaneous, with little reference to the use of other drugs. Only 20.6% (23) self-applied insulin and 17.9% performed local site rotation. Regarding nourishment, 55.9% have four to six meals daily, only 12.5% count carbohydrates, and monitoring by a nutritionist was cited by 44 participants (39.3%). Capillary blood glucose control is performed by 77.7% of the interviewees; 22.3% perform it three to five times a day, however, 48.2% only once and 55.4% keep a record of these results. The HbA1c test was described by 54 (48.2%) interviewees and 32.1% have the exam two to four times a year. The HbA1c test during data collection was performed in 62 of the 112 interviewees, of whom 42 (37.5%) had a result above 7%.

Table 2. Distribution of Variables Regarding the Conditions and Health Care of Individuals with Diabetes Mellitus (S ão Paulo, 2015)

Variable		N	%
	Type 1	10	8.9
Diabetes type **	Type 2	79	70.5
	do not know	20	17.9
Medicine use			
cardiotonic	yes	1	0.9
hypolipidemic *	yes	2	1.8

oral antidiabetic *	yes	88	78.6
subcutaneous antidiabetic *	yes	23	20.6
Performs self-application of insulin *	yes	23	20.6
Make the insulin application * (daily)	yes	20	17.9
Number of meals per day **	1 a 3	49	44.1
	4 a 6	62	55.9
Receive nutritionist orientation	yes	44	39.3
	no	68	60.7
Controls the consumption of carbohydrate	yes	14	12.5
	no	98	87.5
Execute capillary glycemia control (Gc)	yes	87	77.7
	no	25	22.3
Quantities of Gc control (daily)	1	54	48.2
	2	33	29.5
	3 a 5	25	22.3
Register the result of Gc **	yes	62	55.4
	no	44	39.3
Controle the hemoglobin glycated (HbA1c)	yes	54	48.2
	no	58	51.8
Number of HbA1c control times ** (Yearly)	none	58	51.8
	onea	15	13.4
	2 a 4	36	32.1
Result of glycated hemoglobin (HbA1c) **	up to 7%	20	17.9
(executed in the interview)	above 7%	42	37.5
Total		**112**	**100**

* Results with positive affirmation only. ** Excludes ignored data and data that does not proceed.

Questions about how much this sample of individuals have knowledge of the disease and the care that should be received were addressed, object of this study. Tables 3 and 4 grouped these responses and some were highlighted. It has to be noted that when asked about the reason for rotating insulin application, few answered, 9 (8%) individuals stated "to avoid lipodystrophy"; As to complications, the highest response was "blindness" (74, 66.1%), followed by "amputation" (38, 33.9%) and "renal problem" (16, 14.3%). In addition, 66 (58.7%) said that they "control glycemia" and 9 (8%) "control diet", and record keeping is conducted through "use of a book" by 42 (37.5%) individuals and via the "card that the health post provides" 14 (12.5%). From glycated hemoglobin (HbA1c), 46 (41%) attributed to "disease control". Regarding the opinions about the importance of counting carbohydrates, 29 (25.8%) said to "control glycemia" and 18 (16%) to "learn how to eat".

Table 3. Description of Individual's Answers about the Knowledge of Diabetes and Its Care (São Paulo, 2015)

	N (%)		N (%)
Why does the rotation in the insulin application?		**Has knowledge about diabetes complication?**	
Prevents lipodystrophy	9 (8.0)	Amputation	38 (33.9)
Avoid hematoma	3 (2.7)	Blindness	74 (66.1)
Was instructed to do	1 (0.9)	Kidney problem	16 (14.3)
Avoids pain	3 (2.7)	Difficulties in healing	2 (1.8)
Prevents complications	1 (0.9)	Heart problems	2 (1.8)
Can not apply in the same place	2 (1.8)	Loss of sensitivity	10 (8.9)
Apply at UBS	1 (0.9)	Liver problems	1 (0.9)
Does not lose insulin efficiency	1 (0.9)	Hyperglycemia	1 (0.9)
Not oriented to do	1 (0.9)	Hypoglycemia	2 (1.8)
		Arterial hypertension	1 (0.9)
		Does not know complications	1 (0.9)
Control of capillary glycemia			
Why get a blood glucose test?		**How do you control glycemic values?**	
Control glycemia	66 (58.7)	Use of notebook	42 (37.5)
Control diet	9 (8.0)	Do not write, remember "head"	1 (0.9)
Control dosage medication	4 (3.6)	Card that the health post provides	14 (12.5)
Discovering Diabetes	1 (0.9)	Glycemia device registers	3 (2.7)
Stay informed	1 (0.9)	UBS employee notes on the card	1 (0.9)
Today I learned about its importance	1 (0.9)		
In order not to go wrong	1 (0.9)		
I need to be oriented	2 (1.8)		
Prevents complications	2 (1.8)		
Know the value of blood glucose	1 (0.9)		
I feel safe	1 (0.9)		
Have to take care of health	1 (0.9)		
Have prevention	1 (0.9)		
Follow up	1 (0.9)		
To reassure me	1 (0.9)		
Importance of glycated hemoglobin control (HbA1c)			
Controlling the disease	46 (41.0)		
Assess the glycemia of the last 3 months	9 (8.0)		
Decrease the risk of complications	2 (1.8)		
Can not answer	15 (13.4)		

* Excludes ignored responses from the 112 participants of this study.

Table 4. Description of Individual Opinions on the Importance of Carbohydrate Counting (São Paulo, 2015)

The importance of carbohydrate counting	N (%)
The carbohydrate turns into sugar	5 (4.5)
To control blood glucose	29 (25.8)
To adjust insulin dosage	2 (1.8)
To learn how to feed yourself	18 (16.0)
To avoid complications of the disease	2 (1.8)
Do not know what carbohydrate is	8 (7.1)

* Excludes ignored responses from the 112 participants of this study.

Of the individuals interviewed, it was identified that of the 112, 24 (21.4%) attend a diabetes association (Table 5). In the same table, aspects about the diabetes association (AD) were verified and it can be observed that only 24.1% considered that "meeting helps in treatment", but that "events help in treatment" (51.8%); participation "helps to understand the disease" (16%). Several - 33 - (29.5%) reported not attending for "lack of information" and also for "living away and lack of time" (both with 8.9%). Seven (6.2%) also said they had no interest. The most attended event was the "Diabetes Campaign", however byonly 13 (11.6%) of the interviewees. Of the mechanisms for communication sued by the association, TV, radio, social network, pamphlets and magazines, the most cited were pamphlets and magazines, 18 (16.1%) and 34 (30.3%), respectively, and the reasons were related to the knowledge of the disease.

Table 5. Opinions about the Activities Performed by the Individuals Who Attend Diabetes Associations (São Paulo, 2015)

	N (%)		N (%)
Do you frequente the Diabetes Association (AD)?		**Why?**	
Yes	24 (21.4)	Meetings help in the treatment	27 (24.1)
Do you frequente the Diabetes Association (AD)?		**Why?**	
Yes	25 (22.3)	Event helps the treatment	58 (51.8)
Why participate in AD events?		**Why not participate in events?**	
Helps in learning the disease	18 (16.0)	Lack of information	33 (29.5)
Easy to take exams	1 (0.9)	Lives very far	10 (8.9)
		Do not have time	10 (8.9)
		Lack of interest	7 (6.2)
Which AD events do you participate?			
Diabetes campaigns	13 (11.6)		

Lecture with nutritionist	1 (0.9)		
Lecture with psychologist	1 (0.9)		
Do you watch AD TV?	9 (8.0)	**Why do you watch ANAD TV?**	
		Has diabetes orientation	30 (26.7)
Do you listen AD radio?		**Importance of ANAD radio**	
Yes	10 (8.9)	Information helps prevent complications	1 (0.9)
		Being "live" responds doubts at the moment	2 (1.8)
Do you access facebook AD?		**Why do you access facebook?**	
Yes	3 (2.7)	More informed about disease	1 (0.9)
		I do not have facebook	10 (8.9)
Do you receive AD pamphlets?	18 (16.1)	**Do you receive ANAD email?**	3 (2.7)
Do you read AD magazine?		**Why?**	
Yes	34 (30.3)	Knowledge of the disease and its complications	36 (32.0)

* Excludes ignored responses from the 112 participants of this study.

Hypothesis tests were performed with some variables, defining as the dependent variable "attendance to association", which was associated with the independent variables.

However, a hypothesis test with glycated hemoglobin (HbA1c) was also performed, in order to observe the presence of glycemic alterations with the study variables. It was emphasized that we chose to present only the variables in which statistical significance was observed ($p \leq 0.05$), except for some of greater importance to this study.

Table 6 shows that there is no difference in mean age with the results of glycated hemoglobin (HbA1c); the same does not apply to attending AD, in which there is statistical significance in the average differences. It may be noted that subjects with higher ages are amongst those attending AD ($p = 0.017$). As for the number of meals per day, individuals with glycated hemoglobin (HbA1c) up to 7% have a mean and median with a larger number of meals per day; the same was observed in attending AD, with more meals ingested, validated by the mean and median, both statistically significant ($p = 0.006$ and $p = 0.018$, respectively).

Table 6. Difference of Age Mean and Number of Meals per Day with Glycated Hemoglobin (HbA1c) (São Paulo, 2015)

Variable		N *	average/median	±	SD	value p
			Age			
Hemoglobin	Up to 7%	20	66.3/68	51/77	8.277	0.786 **
glycated (HbA1c)	> 7%	42	65.3/67	26/83	11.069	
Frequents	Yes	24	68.7/72	30/83	10.560	0.017 **
D. Association	No	87	65.2/66	26/85	9.477	
			Meals per day			
Hemoglobin	Up to 7%	36	3.7/4	2/6	0.702	0.006
glycated (HbA1c)	> 7%	26	3/3	1/4	0.958	
Frequents	Yes	24	3.8/4	2/5	0.608	0.018
Association	No	86	3.3/3.5	1/6	0.908	

* Excludes ignored data; ** Mann-Whitney / Wilcoxon test.

By observing glycated hemoglobin (HbA1c) related to variables regarding diabetes control care (Table 7), it can be noted that there is no relation amongst them, in counting carbohydrates, nutritional orientation and control of capillary glycemia, except in the habit of attending an AD, because it is verified by the chi-square test that, proportionally, attending AD is higher amongst the best results of glycated hemoglobin (HbA1c ≤ 7%), statistically significant (p < 0.001).

Table 7. Relationship between Glycated Hemoglobin (HbA1c) and Variables of Individuals with Diabetes (São Paulo, 2015)

Variable		Glycated hemoglobin (HbA1c) ***			
		≤ 7%	> 7%		
		N (%)	N (%)	χ^2	value p
Gender	male	9 (32.1)	19 (67.9)	0,003	0.986 *
	female	11 (32.4)	23 (67.7)		
Nutritional	yes	8 (30.8)	18 (69.2)	0,045	0.833 *
orientationl	no	12 (33.3)	24 (66.7)		
Carbohydrate	yes	3 (42.9)	4 (57.1)		0.671 **
counting	no	17 (30.9)	38 (69.1)		
Control of	yes	16 (32.0)	34 (68.0)		0.591 **
capillary glycemia	no	4 (33.3)	8 (66.7)		
Number of times	3 a 5	4 (40.0)	6 (60.0)		0.409 **
GC control (daily)	1 to 2	16 (30.8)	36 (69.2)		

Note the results	yes	11 (33.3)	22 (66.7)	0.317*
	no	6 (24.0)	19 (76.0)	
Attends to	yes	20 (55.6)	2 (7.7)	< 0.001**
Association	no	16 (44.4)	24 (92.3)	

* Mantel-Haenszel test; ** invalid chi-square, exact Fisher test *** Excludes ignored data.

Verifying the relationship between AD and study variables through the univariate analysis (Table 8), it can be observed that there are no gender differences; however, care related to control of illness, such as nutritional orientation, carbohydrate counting, and capillary glycemic control, are related to attending AD, all statistically significant ($p < 0.001$, $p = 0.006$ and $p = 0.013$, respectively). It is important to emphasize that it was observed a statistical significance between attending AD and better HbA1c results (highlighted in Table 7).

Table 8. Relationship between Attending a Diabetes Association (AD) with Variables of Individuals with Diabetes (S ão Paulo, 2015)

Variable	Attend the Diabetes Association				
		Yes	No		
		N (%)	N (%)	χ^2	Value p
Gender	Male	7 (29.2)	42 (48.3)	2.761	0.097
	Female	17 (70.8)	45 (51.7)		
nutritional	Yes	17 (70.8)	27 (31.1)	10.845	< 0.001
orientation	No	7 (29.2)	60 (68.9)		
Carbohydrate counting	Yes	7 (29.2)	7 (8.1)	7.545	0.006
	No	17 (70.8)	80 (91.9)		
Control of	Yes	23 (26.7)	1 (4.0)		0.013
capillary glycemia	No	63 (73.3)	24 (96.0)		

* Mantel-Haenszel test; ** non-valid chi-square, fisher exact test.

4. Discussion

In this study, 82.1% of the sample is in the 60 to 85 age group, 56.2% are females. The increase in the elderly population results in greater vulnerability to chronic diseases, such as type 2 DM with high worldwide prevalence (Silveira, Ramos, Freitas, Rodrigues, de Brito, Serafim, & Bezerra, 2015; Mendes, Goldbaum, Neuber, Marilisa, Cesar, Carandina, & Alves, 2011). As for gender, it is believed that the higher incidence in women is due to the fact that they are more concerned about health than men, seeking more actively health care. In a study carried out in Piau íBrazil, the prevalence of DM amongst females (67.8%) and the age group between 51 and 68 years old (45.3%) was highlighted

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(Carvalho, Silva, & Coelho, 2015). Yet, there are more obese and sedentary women. In relation to years of schooling, 37.4% of the participants had 10 to 16 years. It should be noted that better schooling facilitates the teaching-learning process, favoring the understanding of therapeutic guidelines, knowledge of complications and, consequently, adherence to treatment (Mendes, Goldbaum, Neuber, Marilisa, Cesar, Carandina, & Alves, 2011; Morais, Soares, Costa, & Santos, 2009).

The major problems of adherence to treatment are related to diet, physical activity, glycemic monitoring and medication control (Maia, Reis, & Torres, 2016). The study indicates that women adhere more than men to adequate diet and that the elderly use mainly routinely oral medication and diet for disease control (Mendes, Goldbaum, Neuber, Marilisa, Cesar, Carandina, & Alves, 2011). Carbohydrate counting is a dietary method that allows greater flexibility in the choice of food and better metabolic control, thus preventing episodes of hypoglycemia and hyperglycemia (Costa, Thalacker, Besenbruch, Sominy, & Branco, 2011).

Studies have shown that rigid glycemic control is a major factor in the prevention of complications of DM and with record keeping it is possible to reassess the therapy by adjusting the doses of insulin (Franco, Zanetti, Teixeira, & Kusumota, 2008; Dalewitz & Khan, 2000). An American study showed that 90% of DM patients only take a blood glucose test once a day; this barrier is related to pain when performing the test and the difficulty of recognizing that monitoring is very important for the control of the disease (Dalewitz & Khan, 2000). Regarding complications, the main was "blindness", followed by "amputation" and "renal problem". In a study carried out in Piau íBrazil, it was verified that 80.5% considered themselves informed about DM and in relation to complications, 16.1% reported blindness, 9.3% alterations in feet and 3.4% blindness and changes in feet (Menezes, Lopes, & Nogueira, 2016). According to the Ministry of Health, uncontrolled DM patients are 17 times more likely to develop nephropathy and 40 times more likely to suffer lower limb amputation; acute myocardial infarction is six times more frequent in patients with DM (Menezes, Lopes, & Nogueira, 2016).

In this study, only 21.4% of participants were found to be part of a diabetes association, with 51.8% affirming that "events help in the treatment" and 16% stated that "it helps to understand the disease". The purpose of an AD is to guide, educate and accompany DM patients and their families, with the participation of several health professionals, with the objective of providing a better quality of life (Franco, Zanetti, Teixeira, & Kusumota, 2008). The diabetes associations act in the evolution of the knowledge of the disease through educational interventions. A study carried out in a Family Health Unit shows the improvement of DM knowledge level after educational interventions. It is noted that before these interventions the level of knowledge of 15% of participants was considered very good and post-intervention the number reached 58.8% (Carvalho, Silva, & Coelho, 2015).

Regarding taking the glycated hemoglobin (HbA1c) test, 32.1% take the exam two to four times a year. This examination was performed in 62 participants during the diabetes campaign, of these, 42 (37.5%) had a result above 7%. The results showed statistical significance between the HbA1c level and the frequency of attending an AD. The HbA1c test is an essential parameter to evaluate the control of DM

and the risks of complications. Studies have shown that maintaining HbA1c levels below 7% in patients with DM significantly reduces the risk of complications, while levels above 7% significantly increase micro and macrovascular complications (Sumita & Andriolo, 2008).

The verified result allows inferring that attending an AD seems to positively influence the control of diabetes. Regarding the opinions about the activities performed by participants attending an AD, the most cited event was the Diabetes Campaign. The purpose of this action is to educate people about the causes and consequences of DM and to encourage activities aimed at improving health through medical and motivational lectures, free blood glucose tests, glycated hemoglobin testing, blood pressure tests, eye fundus and foot evaluation (Sociedade Brasileira de Endocrinologia e Metabologia, 2017). The mechanisms of mass communication of AD include: television program, radio, Facebook, e-mail and the most cited were pamphlets and magazines. The written material is a facilitator of the educational process and has the following advantages: seriousness of the author, assimilation of the message at own individual rhythm as it can read as many times as necessary, choice of time and place more appropriate for reading. Health communications aim to increase awareness of the disease, show the benefits of behavioral change and reinforce knowledge.

The message can be conveyed by mass communication such as: television, radio, magazines, newspapers, the Internet and through interpersonal relationship. The health professional must select the communication channel that best fits the patient's needs; well-developed materials, with easy-to-understand information facilitates the patient's adherence to treatment (Moreira, Nóbrega, & Silva, 2003).

Adherence to treatment is understood as the patient following the recommendations of a health professional through a therapeutic alliance between both. Non-effective communication can lead to noncompliance with treatment, which in turn is the main cause for the increased mortality rate amongst patients with chronic diseases.

As for communication channels, only three participants (2.7%) reported accessing Facebook and the same number accessed e-mail. There is a large number of elderly who are not aware of new technologies, including the Internet. The human being has a tendency to resist changes and fears the unknown; however, interest in learning can be perceived in this part of the population (Verona, Cunha, Pimenta, & Buriti, 2006; Garcia, 2001; Kachar, 2002). It is important to emphasize that aging does not alter the learning capacity of the elderly (Stefanelli, 2005).

5. Conclusion

Thus, it can be concluded that DM patients who participate in communication actions have a better adherence to the treatment, and, consequently, a better control of the disease.

Finally, it is believed that the results of this research cannot be generalized. The reality of the area studied is singular, presenting its own characteristics, being, therefore, a limitation of the study. It is clear that this theme requires continuous reflection and is not exhausted in this work. It would be

interesting to seek a comparison between DM treatment adherence in adolescents and the elderly, from the most efficient means of communication for each age group. Therefore, new studies could be elaborated to continue the investigation, in order to deepen the results presented in this research.

Ethics Approval and Consent to Participate

This is a quantitative study of descriptive nature. The research was conducted in a nationally renowned, philanthropic and non-profit diabetics association. The sample consisted of 112 individuals who participated in the National Diabetes Campaign, promoted by this institution. As inclusion criterion, the following participants were selected: patients with types 1 and 2 DM, over 18 years old, who were diagnosed at least two years ago and who voluntarily accepted to participate in the study. Participants with gestational DM and DM carriers who were part of the professional staff that participate in communication actions of the institution surveyed were excluded.

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Consent for Publication

All authors have read and approved the submission of the manuscript; the manuscript has not been published and is not being considered for publication elsewhere, in whole or in part, in any language.

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