Health Communication Action on WhatsApp based on the Digital Profile of People with Hypertension and Diabetes

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Abstract

Chronic noncommunicable diseases are the cause of a large number of deaths in Brazil and require new approaches to health education and communication, including incorporating digital technologies. However, social disparities and access to these technologies make the design of health education campaigns and interventions a challenge. Therefore, the objective of this study was to evaluate the digital profile of SUS users, patients with hypertension and Diabetes Mellitus (DM) to develop a health communication strategy considering the profile of these users. 499 individuals were interviewed in Maringá-Paraná and of these 57 were diabetic, 280 were hypertensive and 162 were diabetic and hypertensive. For the creation of content, the principles of design, software for graphic and audio creation, as well as guidelines for the development of health content on adherence to drug therapy were used. It was observed that 32.87% of the participants belonged to the age group of 50 to 59 years old, with 64.93% being female. Regarding the users' digital profile, 81.56% have social networks, of which WhatsApp (95.79%) and Facebook (68.54%) were the most popular. The data allowed to define a target audience, persona and vehicle to be used in the intervention (WhatsApp). 58 images, 14 audio files and 49 text messages with health education content were originally produced by the team. The present study pointed to the use of WhatsApp's multimedia resource with a focus on images and audios that would meet the socioeconomic profile of the target population. Prior knowledge of the recipients' profile promotes a more assertive and objective communication of health communication campaigns, differing from mass communication strategies that are not intended to personalize the message for the various segments of the public.

Keywords: Chronic Noncommunicable Diseases. Health Communication. Health Education.

INTRODUCTION

The World Health Organization (WHO) estimates annual deaths from chronic noncommunicable diseases (CNCDs) to be around 36 million, with the highest mortality rates in low-income countries where the population is exposed to risk factors and with less access to information and health services[1]. Among CNCDs, systemic arterial hypertension (SAH) and Diabetes Mellitus (DM) represent a serious public health problem in Brazil which, through the Unified Health System - SUS, has public policies for the acquisition, dispensation and distribution of medication regularly and systematically to all registered patients. However, one of the biggest challenges in combating high blood pressure is non-adherence to the treatment, as only 1% to 15% adhere to these therapies in the country[2].

In this context, investments in health education and intervention programs are

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necessary. So far, the existence of targeted public communication campaigns with content to increase rates of adherence to drug therapies is unknown. In the design of communication actions for diabetes and hypertension, or in traditional health interventions, messages are produced by health institutions and transmitted through mass communication vehicles (radio, TV, banners and pamphlets) that are made available to health centers or in the media in general[3]. Although important, their effectiveness is difficult to measure and, often, the message is generic or uses a communicative strategy that is not properly understood by the population[4]. The new technological scenario and Internet access in the last decade has opened new perspectives for targeting content to the population with better cost effectiveness. However, for these actions to be more effective, it is necessary to know and update the profile of use and access to digital technologies (here called digital profile) in order to develop strategies that effectively reach the population.

It is considered that, in addition to the dynamics of incorporating technologies, there are regional disparities in relation to access to health in Brazil.

Therefore, the objective of this study was to evaluate the profile of access and knowledge about digital means of communication of SUS users with SAH and DM for the elaboration of a health communication strategy, considering the profile of users in the development and reception of these messages.

METHODOLOGY

Socioeconomic profile and digital profile

A quantitative descriptive cross-sectional study was carried out to characterize two profiles: a) socioeconomic profile (family income, educational level, age and sex); and b) digital profile (most used social network, purpose of using the internet, most used device for navigation and time of use). For this, a questionnaire was developed to collect this data from hypertensive and diabetic users registered in the Basic Health Units - BHUs in the city of Maringá, PR. 499 users registered in 33 BHUs in the city and who had smartphones participated in the study and were recruited during the researchers' visits to BHUs during the hours of greatest flow of patients in the HiperDia group, from October 2017 to April 2018.

To assess the association between sociodemographic variables and the individuals' digital behavior, the chi-squares test was used for questions that permitted only one answer. For questions that permitted multiple answers, the chi-squared test with a second-order Rao-Scott adjustment was applied, which was used to ascertain whether or not there is an association between variables. All analyses were performed with the aid of the statistical software environment, R (R Development Core Team) version 3.3.1, and the level of significance was set at 5% for all tests.

Construction of material for health communication

The exploratory phase dealt with the creation of communication content and the development of pieces for health education. For the construction of these communication pieces, socio-demographic and digital profile data were taken into account. The pieces created were original, elaborated by a professional qualified in Communication/ Graphic Design, accompanied by an interdisciplinary team using Adobe Illustrator software version CC 2017. A Dionysian approach described in the Advertising Writing

Manual5 was also used; where an attempt is made to establish an emotional relationship between the content and receiver.

The audio files were recorded at the higher education institution itself. After the recordings, the audio files were edited in Adobe Audition CC 2017 and evaluated by a speech therapist for comprehensibility.

The final pieces (images, audios and texts) were submitted to the consideration and evaluation of specialists from different fields of knowledge: Health Promotion, Pharmacy, Nursing, Arts and Communication in collective meetings. These professionals evaluated the materials regarding: accuracy of information, interpretation (understanding of the message clearly) and technical quality of the execution (image resolution, legibility, audio quality, contrast, color palette, among others). Adjustments to images, texts and audios were made at the time of the evaluation at the meetings, with the presence of the graphic designer. After being approved by the specialists in these rounds, they were incorporated into a media bank and inserted in the Bulk Service message sending system (© Bulk Services 2019), a paid system with a web interface that allows the scheduling of sending messages to WhatsApp to a phone list previously registered by the participants.

Ethical aspects

The project was submitted and approved by the research ethics committee (CEP) of UNICESUMAR under the Opinion Number 1.145.795 and the research participants signed the Informed Consent Form (ICF).

RESULTS

Table 1 presents the description of the sociodemographic characteristics related to the digital behavior of the individuals who participated in the study.

Table 1– Distribution of frequencies of the sociodemographic characteristics of the research participants.

Question	Absolute frequency	%
Age		
Up to 29 years	7	1.40%
From 30 to 39 years	25	5.01%
40 to 49 years	94	18.84%
50 to 59 years	164	32.87%
60 to 69 years	140	28.06%
70 to 79 years	61	12.22%
80 years or older	8	1.60%
Sex		
Female	324	64.93%
Male	175	35.07%
Education		
Illiterate	19	3.81%
Incomplete basic education	85	17.03%
Complete basic education	123	24.65%
Complete primary education	79	15.83%
Complete high school	169	33.87%
Complete higher education	24	4.81%
Income		
From 1 to 2 minimum wages	275	55.11%
More than 2, and up to 4 minimum wages	176	35.27%
More than 4, and up to 6 minimum wages	34	6.81%
More than 6, and up to 8 minimum wages	7	1.40%
More than 8, and up to 10 minimum wages	5	1.00%
Above 10 minimum wages	2	0.40%

Table 2 shows that the vast majority of respondents (94.99%) had a smartphone for their own use, and the activities for which they mostly

use the cell phone/smartphone are sending and receiving messages via WhatsApp, making and receiving calls and accessing the internet; these options were reported by 83.37%, 78.76% and 47.39%, respectively.

Table 2– Frequency distribution of the digital behavior of the research participants.

Question	Absolute frequency	%
Activity for which the cell phone is used*		
Make and receive calls	393	78.76%
Send and receive text messages (SMS)	103	20.64%
Send and receive messages via WhatsApp	426	85.37%
Access the Internet	236	47.29%
Play	45	9.02%
Others	1	0.20%
Did not answer	1	0.20%
Internet usage*		
Recreation	222	44.49%
Doing research / studying / reading news	298	59.72%
Shopping	61	12.22%
Enter social networks	407	81.56%
Others	20	4.01%
Did not answer	4	0.80%
Most used device to access the internet*		
No access	13	2.61%
Notebook / Personal Computer	153	30.66%
Smartphone	464	92.99%
Friends computer	10	2.00%
Computer at work	26	5.21%
Tablet	14	2.81%
Others	3	0.60%
Estimated hours per day on the internet*		
None	10	2.00%
Less than 1 hour	218	43.69%
1 to 3 hours	230	46.09%
4 to 6 hours	40	8.02%
7 to 10 hours	10	2.00%
More than 10 hours	6	1.20%

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Question	Absolute frequency	%
Most used social networks*		
Not applicable	8	1.60%
Facebook	342	68.54%
Whatsapp	478	95.79%
YouTube	233	46.69%
Twitter	9	1.80%
Google+	207	41.48%
Others	8	1.60%
Need help using the computer		
Yes	193	38.68%
No	305	61.12%
Did not answer	1	0.20%

*The question permits more than one answer. Source: authors (2019)

Considering the activities for which respondents use the internet, it is noted that 81.56% access social networks, 59.72% do research/study or read news and 44.49% use it for leisure. These latter are the most common activities, and the cell phone/smartphone is the most cited device when asked about which device they use to access the internet.

Only 2% of respondents answered that they do not spend any hours per day on the internet, while 43.69% and 46.09% indicated that they spend less than an hour and between one to three hours, respectively. Almost all respondents reported that they have WhatsApp (95.79%), while Facebook (68.54%), YouTube (46.69%) and Google (41.48%) are also frequently cited social networks.

It is also seen that when asked about what other technological devices they have, 93.39% indicated a smartphone/cell phone, 37.88% a notebook and 10.82% a tablet. Regarding the use of computers, 32.67% of the interviewees answered that they do not use it, while 44.89% have used it for more than 5 years and it was also found that almost 40% of the respondents reported that they need help to use the computer.

Aiming to assess the relationship between

sociodemographic characteristics and the interviewees' digital behavior, the chi-squared association test was applied, using the second-order Rao-Scott correction for questions that permit more than one answer; the results are presented below:

Table 3– Results of the chi-squared test of the association between sociodemographic characteristics and the digital behavior of the research participants.

Question	Age	Sex
Activity for which the cell phone is used* c	<0.001*	0.010*
Internet usage c	0.001*	0.013*
Hours per day on the internet	0.009*	0.342
Social networks used c	0.001*	0.066
Need help using the computer	0.001*	0.126

* p-value <0.05.
c The question permits more than one answer, and the Rao-Scott second order correction was applied to the chi-squared test. Source: authors (2019)

According to the results shown in Table 3, it is observed that at the significance level of 5%, the age of the interviewees had a significant association with the activity for which the patient most uses the smartphone, the activities for which he uses the internet the most, the number of hours spent on the internet per day, the social networks used, the time spent using computers and the need for help using computers.

Sex, on the other hand, was significantly associated with the variables related to the activity for which the patient uses the smartphone the most, the activities for which they use the internet the most, the device used to access the internet, the other technological equipment they have, the length of use of computers and the need for help using computers.

Both education and income showed a significant association with the same factors identified for sex, in addition to the social networks used by patients, according to the results of the association tests.

On the other hand, only the time spent using computers and the need for help using them, showed a significant association with marital status. The description of the relationships between the variables that showed a significant association for each of the sociodemographic characteristics evaluated are inserted in the figures in Appendix I, II and III.

Among the survey participants who indicated using their cell phone for calling and WhatsApp activities, the highest percentages are of illiterate individuals or those with an elementary education (complete or incomplete) together, as presented in Appendix III; which also shows that as for devices to access the internet, it is seen that the illiterate or people with elementary education correspond to about half of those who indicated that they use the cell phone and those that do not access the internet. The same is true for the cellular option when asked about other technological equipment they use.

Production of images, audio and text

Fifty-eight images were produced for a clinical trial intervention with the aim of improving adherence to drug therapies for diabetics and hypertensive patients. The dimensions of the images were 1920 by 1080 pixels (full HD), as it is considered to be an adequate dimension for WhatsApp images on the website of a company specialized in Digital Branding (ingagedigital.com.br).

Figura 1– Example of graphic material produced. Source: authors (2019)

In all, 14 audio files were edited after recording in the studio, below is a transcript of one of the messages sent to the participants:

"Hi guys, my name is Amanda, I'm a nurse. my Unicesumar colleagues and I had contact with you at the health center, when you agreed to participate in the diabetes project, and from now on, you will receive messages with diabetes health tips, you do not need to reply to the messages and we hope to help you take care of your health."

As for text messages, forty-nine were prepared, below is a text produced and sent over a two-day period on the topic "Drug treatment" [1] and a "reminder" message on the content of the intervention [2]:

[1] It is very important that you take your medication every day, at the time and dosage that your doctor has indicated. Follow your treatment to the letter.

[2] I hope you are taking advantage of our tips to take care of your health, remember that you do not have to reply to messages, ok?

DISCUSSION

The sociodemographic profile helped define the primary target audience, composed mostly of women aged over 50 years old, with little education (incomplete elementary school) and a low income (up to 2 minimum wages). The definition of a target audience meets the requirements for a communication action to be directed to a specific profile, thus avoiding communication noises, that is, the target population's lack of understanding the elaborated message6. Using the language within the field of publicity and advertising, this definition of audience is also called segmentation (tailoring) and is essential for the construction of communicational pieces that fulfill the objective of not only transmitting information but also enabling the receiver's involvement with the theme[7].

The strategy of defining and directing messages to a target audience ensures that the recipients identify the elements and context of the communication, and become, even if minimally, emotionally involved, tending to accept and reproduce the behaviors oriented in the campaign[8]. It is extremely important that the health education content takes into account the reality and context of the recipients, their prior knowledge on the subject and frequent questions they may have, so that the message becomes more effective and the chances of the recipient participating or becoming active in the communicational process increase considerably[9]. The digital profile is therefore essential to develop content that seeks to integrate digital media in communication actions and thus minimize the costs of campaigns and reach a greater number of people.

After defining the target audience, from the data and analysis of the sociodemographic profile, a persona was created. It is a sender profile imagined as a person, an "image", with the intention that the messages are presented in a humanized way to the public[10] and users feel that it is a person who speaks and sends messages to them. Thus, the persona was defined as a young nurse, Amanda, 29 years old, resident of the city and who works in a Basic Health Unit and is very integrated to the HiperDia Program. The audios were recorded by a female voice that personified these characteristics.

The messages created and sent by the persona had mostly an educational approach, with some motivational messages. The frequent use of educational materials as forms of health education has been shown to be an essential element in the teaching-learning process, especially in the case of chronic diseases[11]. Such materials are especially useful in cases of diabetes because they improve knowledge and play an active role in patients in order to promote and improve health status[12].

A highlight of the digital profile of the target audience is the ratio of hours per day on the internet according to the age group of the research participants. More than half of people between 45 and 60 years old reported that they use the internet for more than 10 hours a day, remembering that the highest percentage of interviewed users is concentrated in this age group. Among the most popular services in the use of smartphones are applications and social networks, it is estimated that more than 3 billion people worldwide use social networks on a monthly basis, especially WhatsApp

and Facebook. WhatsApp (WhatsApp Inc. Mountain View, CA) is, for example, the leading messaging app in 128 countries worldwide, compared to the 72 on Facebook Messenger[13] and was then chosen as the best vehicle and communication channel to target the content of the intervention since it was also the main tool declared by the target audience in the research. In fact, it is one of the most downloaded apps in the world, with the advantage of being free and with an interface already recognized by the user, accounting for about 20% of the total use of the smartphone[13]. Also noteworthy is the presence of studies that highlight the feasibility of the application to deal with health interventions[14] including with individuals with diabetes[15]. In Ecuador, a survey identified the app as the one most recommended by patients with Diabetes to receive information about the pathology or as a channel of communication with health professionals[16].

Although popular, other communication channels were not selected by the majority of the target population. Online social networks like Facebook and Youtube show growing trends, however, Youtube appears in the third position in a study in Brazil at 17% and Instagram at 12%[17]. In the case of Youtube, it is a network exclusively dedicated to the audiovisual modality, while Instagram is exclusive for photographs, videos and graphic images. Facebook, in the same survey, was mentioned as the main social network used by the population. However, it is not an instant message access network, being a channel for the asynchronous communication type and integrated with a dynamic post in a timeline (wall). For this, Facebook launched an application called FaceMessenger, which was not listed by users. Consequently, the highest percentages of individuals who use their cell phones for calling and WhatsApp activities are illiterate or with a complete elementary education and, as already demonstrated in a study by Guibu et al.[18], it is known that 54% of SUS users had completed elementary school. Therefore, m-health intervention programs for the population served by SUS should cover populations with the most varied levels of education, and WhatsApp, at the moment, seems to be the most popular channel for addressing content. Social networks like Google +, LinkedIn and Twitter have not proved popular enough for our target audience and project intentions.

The low educational level of users helped to define the communication strategies that take into account the multimedia environment of WhatsApp. Prioritizing text messages, such as SMS interventions, in this new WhatsApp content did not seem appropriate. Several studies describe the sending of SMS messages (exclusively text) in several health intervention and education actions[19,20], and many of these surveys endorse SMS as a tool for sending information to low-income patients[21]. However, the current moment points to WhatsApp as a tool widely used by the target population and its nature of combining text, image and audio is advantageous when compared to the SMS service. According to data from Anatel (National Telecommunications Agency) there are approximately 236 million cell phones and about 96% of cell phones with internet access have the WhatsApp application installed. In our survey, this rate was 94.99% of respondents have their own smartphone and within that number, 95.79% use the WhatsApp application. Studies that indicate the viability of WhatsApp are initial and have positive and negative results[22,23]. Thus, considering this new environment, we combined text, audio and image in the messages sent.

The combination of different media elements to address content also aimed at more effective communication and the search for a complete and multimedia learning. Education theorists already point out that the combination of different media (video + text + image) tends to have a more effective result in the teaching and learning process[24], including in the field of health education.

In view of the profile of the target audience, using the audio resource was sought for because, according to Ferrareto[25], the sound and dialogic content tends bring sender closer to the receiver. Audio files recorded and sent to the receivers can guarantee a strong personal and humanized characteristic, since the receiver recognizes the voice of the sender. In this way, the recipients come into contact with content that made it possible to broaden their understanding of the theme, thus, promoting the development of their autonomy[26].

Another resource used was that of images. Richards and Hample[27] claim that when receptors assimilate elements that are already known, the chances of persuasion increase. The vector images produced for sharing were structured based on the profile of the main target audience aiming at the easiest way to interpret the message. Figure 1 shows that the images produced are colored, with an adequate size for reading on the cell phone screen and with the graphic representation (icon, design and universal symbols (ex. prohibited)) occupying the central area of the image. Accompanied by the images that quickly highlight an understanding of the theme, are texts and phrases that complement the content of the graphic production.

Finally, the design of a campaign with these characteristics and using this medium of social networks differs from traditional mass communication actions. The possibility of knowing the socioeconomic profile of the user and their profile of consumption of digital media allowed the structuring and elaboration of personalized content and aimed exclusively at the study's target audience. By knowing certain digital habits and customs of the target audience, it was possible to develop communication strategies that minimized possible noise.

Indeed, the recipients' prior knowledge promotes a more assertive and objective communication. Therefore, it differs from mass communication, which does not aim to personalize the message for the various segments of the public.

CONCLUSION

This information may serve as a guide for other future campaigns that seek to use the smartphone as a channel of communication. This study evaluated the socioeconomic and digital profile of patients with systemic arterial hypertension and diabetes mellitus and pointed out the feasibility of using the WhatsApp messaging application for the context of communication and health education. It is an application widely used by the population. Although recognizing that it is a profile of a population in a medium-sized city in the south of the country, we believe that the data can be extrapolated to other cities and regions.

The contents created (images, texts and audios) proved effective in the transmission of information. However, some limitations of the study deserve to be mentioned. The use of the BulkService system, which sent messages to the list of registered phones, did not allow verification of whether messages were viewed or read. Nor was an instrument created for professionals to evaluate communication pieces and issue final

notes for each of the contents, which would allow us to identify which images, texts or audios were, in the view of professionals, the most complete and interesting.

It is worth mentioning that the communication pieces elaborated in this study were restricted to the theme of diabetes and hypertension, chronic diseases and adherence to drug therapy. Considering that the participants of the HiperDia group of SUS already have previous knowledge about these diseases through the health system, comparing the reception of messages by these users with other groups could be an interesting development for future research considering the possibility of identifying its potential for health promotion.

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