ORIGINAL RESEARCH ARTICLE   **OPEN ACCESS**

THE USE OF INFORMATION TECHNOLOGY IN HEALTH: COLLECTION AND ANALYSIS OF DATA ON RESEARCH WITH THE ELDERLY

[1,2]Caio Venancio Duarte Carvalho, [3]Tatiane Dias Casimiro Valença, [4]Vilmar Carvalho, [1]Jonathan Felipe Silveira Guerrero, [5]Joice Amorim Santos, [5]Everson Mateus Almeida Magalhães [5]Isabely Fróes Correia, [5]José William Sousa Reis, [5]Saionara Silva Brito and [5]Pollyanna Viana Lima

[1]Graduate of Eletrical Engineering from Faculdade Independente do Nordeste. Vitória da conquista/BA.
[2]Graduate of Eletrical Engineering from na Universidade Federal do Oeste da Bahia. Bom Jesus da Lapa/BA
[3]Graduate of Physiotherapy from Universidade Estadual do Sudoeste da Bahia. Jequié/BA
[4]Graduate of Geography from Universidade Estadual do Sudoeste da Bahia. Vitória da conquista/BA
[5]Graduate of Nursing from Faculdade Independente do Nordeste. Vitória da conquista/BA

ARTICLE INFO	ABSTRACT
	Alternative methods such as the use of technologies that will facilitate research and extension are on the rise. An example is the application of electronic tools focused on information technology, mainly in quantitative delineation research, since these have the objective of analyzing facts or phenomena through numerical data, using collection instruments such as questionnaires and forms. Thus, this research aims to report the experience of undergraduates of the scientific initiation of the Nursing and Electrical Engineering courses regarding the integration of these different areas of knowledge in the construction and use of online questionnaires and specific software for the analysis and data collection in a scientific research carried out with elderly people diagnosed with Diabetes Mellitus. The study was carried out with five questionnaires: Socio-demographic and economic; Health conditions; Beck Anxiety Inventory, Geriatric Depression Scale, and WHOQOL-OLD. The first step was the development of questionnaires on the platform. After all the development, the questionnaires were ready to go to the field. Where each researcher completed the questions and sent the answers to the database, and Google system already stores them, making it possible to generate spreadsheets and tables for later analysis. The analysis was done using known statistical software, SPSS and Microsoft Excel, using the available descriptive and correlation statistics. According to the researchers' reports, using the Google Forms platform made it possible to make the application of the questionnaires less expensive and more dynamic in the research. In addition to the statistical tools greatly increasing the efficiency of the research due to the short time spent in the data analysis.

INTRODUCTION

The use of information technology linked to the media via the Internet has stood out as a valuable tool, facilitating access to information and disseminating knowledge.

*Corresponding author: **[1,2]Caio Venancio Duarte Carvalho,**
[1]Graduate of Eletrical Engineering from Faculdade Independente do Nordeste. Vitória da conquista/BA.
[2]Graduate of Eletrical Engineering from na Universidade Federal do Oeste da Bahia. Bom Jesus da Lapa/BA

In the same way, looking for new technologies that facilitate and help in the development of scientific research is an increasingly present realit (Faleiros, Käppler, Augusto, Pontes, & Souza, 2016). Since the mid-1990s, especially with the widespread use of the Internet, the use of online electronic questionnaires has become a periodical practice in academic and market research, aiming to have faster and more objective forms in the collection, organization and in the processing of researched data (Vasconcellos-Guedes & Guedes, 2007). The applications of these electronic tools are being used, mainly in

descriptive quantitative delineation studies, being that the objective of such studies is the analysis of facts or phenomena through the use of quantitative artifices, aiming at the systematic collection of data s (Azevedo, Miazaki, & Porfirio, 2014). In this type of research the use of instruments of data collection and analysis is configured in the form of scales, forms, questionnaires and tests validated nationally and internationally or built by the researchers according to the research objectives (Carvalho, Costa, & Souza, 2015). The questionnaires were made containing questions that allow the collection of data that is complex, varied and in greater number, since they are designed to be filled out quickly and objectively, providing greater uniformity.(Prajapati, Blake, Acharya, & Seshadri, 2015). The use of these instruments allows the systematic collection of information and the correlation of its variables through statistical tests producing a greater number of information concerning the research topic. Another facility is that, quite often the instruments are sent electronically, without the need for the physical presence of the researcher in the field of research (Faleiros et al., 2016). Nowadays it is observed that this means is a tool for collecting data that is widely used in research, especially in the health area (Brandão et al., 2012). Usually, they are applied on printed paper, taken to the field and duly filled out by research subjects or the researcher. The data obtained is subsequently added to spreadsheets or to a specific software for statistical analysis and data validation. (Manzato & Santos, 2012).

In this sense, there is a constant coexistence between research and the collection and analysis of data. It is possible to find out that the data collected in the research process needs an increasingly practical treatment, making it possible to have very relevant information (Pestana & Gageiro, 2008). To faithfully analyze information in all areas, social or health, data is becoming increasingly more necessary, since the time to perform these analysis should be very short. It is worth noting that nowadays, data can be accessed more easily because of the Internet and other means of communication, making it quite challenging to obtain useful knowledge from such data (Dho, 2018). In this context, statistics, which is a branch of mathematics, allows the researcher to make the quantitative analysis of the data collected in a more reliable and fast way (Meirelles, 2014) because after all it is an exact science. According to Pestana and Gageiro (2008) this type of analysis allows the researcher to analyze the data in an unbiased way. In quantitative approaches, there is a possibility for the researcher to verify trends and patterns, analyze prevalences, risks and correlations (among other statistical methods) from a database, and can do a hypothetical test, in order to elaborate a plan of action or methodology that can solve the research situation/problem (Field, 2009). In this sense, using a tool that increases reliability and speed in the results of the research and that is easy to access and relatively low cost, is of great value in the field of scientific research. Several statistical software programs have been developed and are available on the Internet, even at no cost to be applied in any type of quantitative research (Meirelles, 2014). It is worth noting that the tool alone is not enough to achieve the research objective. The researcher must have knowledge of the subject to interpret the analysis presented by the program (Field, 2009).

Thus, this work aims to report the experience of undergraduate students of nursing and electrical engineering courses regarding the integration of these different areas of knowledge in the construction and use of online questionnaires and specific softwares for the analysis and data collection in a scientific research carried out with elderly people diagnosed with diabetes mellitus.

MATERIALS AND METHODS

This is a descriptive study, a type of experience report, based on three Family Health Units (USF) of a municipality in the interior of the stae of Bahia. The experiences of the usage of the software for data analysis and the Google Forms platform for the collection of data were experienced by 4 undergraduates of the nursing course and 1 of the electrical engineering course, participants of the Scientific Initiation of the Faculdade Independente do Nordeste / FAINOR, during the collection and analysis of data of the research project titled: Biopsychosocial and Quality Profile. Life of elderly people with diabetes mellitus registered in basic care: a comparative study. The participants of this research project were 63 elderly people of both sexes, registered in the Family Health Program (PSF) of the municipality of Vitória da Conquista-BA, with diagnosis of type I and type II diabetes-mellitus, with cognitive preservation (evaluated by the undergraduate students using the Mini Mental State Examination / MMSE) (Folstein, Folstein, & McHugh, 1975), and who agreed to participate in the study, signing the Term of Free and Informed Consent (ICLE). This was approved by the Research Ethics Committee / CEP of the Faculdade Independente do Nordeste / FAINOR, with approval no. 2.234.746. The data collection of this project was carried out by the undergraduate students of the nursing course in partnership with the Community Health Agents of each USF using the following instruments: Socio-demographic economic questionnaire; Health Conditions Questionnaire; Beck Anxiety Inventory (Beck, Epstein, Brown, & Steer, 1988); Geriatric Depression Scale (Paradela, Lourenço, & Veras, 2005); Whoqol-old (Fleck, Chachamovich, & Trentini, 2003). All instruments were transferred to the databank by the electrical engineering student, through the Google Forms online questionnaire platform. Before the application, the undergraduates were guided and trained in how to fill out the online questionnaires. Then, they went on to collect data in the field, taking along cell phones and laptops, so that the participants could fill out the questionnaires. After the completion of the application of each questionnaire, which was done in a quick and safe manner, the information that was collected was sent in real time by each undergraduate to the Google database.

For the data analysis, three software programs were used: Google Forms; Microsoft Excel; Statistical Package for the Social Sciences (SPSS). The data collected was exported from the Google Forms online platform and organized into spreadsheets in Microsoft Excel. Then the Descriptive statistics of all questionnaire answers were made in the SPSS, making the WHOQOL-OLD analysis the only one done in Excel. The results were organized and presented regarding the quantity and type of responses of each individual, separated into categories defined by the questionnaires themselves. After completing the process of collecting and analyzing the research data, a meeting took place with the participation of all involved in the data collection as well as the electrical engineering student. At that moment the undergraduates reported the experiences of using the online questionnaires pointing out the advantages and disadvantages of this type of instrument for the completion of the research. This moment

was important because it served as a parameter for the viability of using these resources in the research and improvements in the negative points presented by the undergraduates.

RESULTS

According to undergraduates' reports, there was no difficulty in using the questionnaires during field data collection. Some intercurrences were pointed out, such as problems in staying connected to the Internet in some places due to the lack of coverage of the operators or the absence of Internet via WiFi. Despite this, all related impasses were fixed and data was collected without major difficulties. The advantages described by the undergraduates regarding data collection were: the use of a large amount of paper and pen during locomotion in the field of research and application of questionnaires was not needed; the ease and agility in correcting a speficic data that was filled out wrong; sending the information right after the collection to a database; a filling-out process that was easy, simple and fast. Regarding the analysis of the data, the advantages evidenced by the undergraduates were: agility in the construction of tables and graphs, being carried out quickly; minimization of error rate calculation to practically zero; processing and manipulation of data in a way that they can be accessed, found, and viewed; the possibility of compatibility and exchange of data between the software programs that were used, since all of them were used together to carry out the analysis.

According to the reports from the undergraduates, with the use of the Google Forms platform, another advantage was that it was possible to make the application of the questionnaires more contributing to reduce the time in the process of applying the questionnaires, and not one elderly person was either tired or unwilling to answer questions raised by the researchers.It should be noted that six instruments were used for data collection and the average time for it to be done was 60% lower than it would've been with the printed method. In addition, with the SPSS and Excel tools, the statistical analysis proved to be much more agile and fast, taking only a few hours to be completed, and in a quantity of data of this nature, it would be difficult and tiring to perform all calculations manually. From the undergraduate's report, the only and greatest difficulty of the data analysis was the familiarization with the use of specific software. Where the undergraduate in electrical engineering had to take courses and carry out studies on how they worked, as well as emphasizing the importance of prior knowledge of general statistics. The online platform provides its own data alalysis, using the recognition of the patterns of answers, with a column for each category evidenced in the questionnaires. On the other hand, SPSS and Excel are richer in statistical manipulation, where there was manipulation of specific charts, graphs and tables for each analysis, such as correlations, cross-reference tables, and the analysis of scores in some questionnaires.

DISCUSSION

Studies have revealed some advantages of using online questionnaires, such as: cost with printing copies; saving time with a faster way of collecting and processing all information; obtaining answers with higher quality; creation, storage and immediate access to the database (Carvalho et al., 2015). These advantages have clearly generated a new trend in formatting research (Vasconcellos-Guedes & Guedes, 2007).

Thus, the online medium shows itself as a new tool for the field of research and can be used in the elaboration, application and analysis of questionnaires.(Manzato & Santos, 2012). . It is worth mentioning that the impersonality of the use of electronic means does not prevent the contact between the interviewee and the researcher, preserving social interaction, since the use of this tool is only a means of assisting in obtaining information for the research (Carvalho et al., 2015). Studies point out that the use of online questionnaires are becoming increasingly popular, and that in the next few years the use of printed media in scientific research will be limited only for documents and protocols, and the entire collection procedure will be replaced by the online method (Azevedo et al., 2014). The use of virtual and online questionnaires are becoming more and more essential to reduce expenses and ensure greater reliability and agility in the collection of dat. A survey done in the United States shows that at cost when using questionnaires online instead of the printed method is at least four times lower (Russell, Boggs, Palmer, & Rosenberg, 2010). Some studies demonstrate that there are ways to conduct an effective data analysis using appropriate software, seeking to raise and explore consistent data that can directly influence the results of the research project (Pestana & Gageiro, 2008). The intention is to enable the researcher to be more agile and fast, dismissing the human error, gaining time and also a certain analytical power in the exploration of the data (Freitas, 2000). In this sense, the research that focuses on the comparison and analysis of tools for statistical data processing, which was used in this research, confirmed the great value of the use of specific software for data analysis. The programs offer a detailed series of tools and easily manages the required tasks (Rybenska, Sedivy, & Kudova, 2012).

In terms of disadvantages, the difficulty pointed out by the undergraduates was the accessibility to the network at the time of the collection in some places for it being done in the peripheral neighborhoods of the county. Some collections had to be rescheduled because there was no connection at the time. Authors describe that any form of methodology has limitations and / or disadvantages. In case of the use of online questionnaires, the lack of computer knowledge and preparation for the use of online content by the researchers who applied questionnaires and the limitation of the Internet access at the research sites are pointed out (Giro & Mackenzie, 2007). However, these limitations can be overcome without major difficulties. As for the disadvantages of the software used, it is possible to emphasize: high monthly value paid for its use; SPSS has a complicated installation process that is subject to many errors; The researcher's need to use the right forms of analysis, dismissing the use of programs for people without previous training, making their use limited to the electrical engineering student, since not all undergraduates were able to take part in the training process(Apostolico & Egry, 2013).

Conclusion

The reports of the experience of using online questionnaires and specific software in the collection and analysis of the data of this research evidenced that the use of these tools presented more advantages than disadvantages. As for the application of the online questionnaires, it is a fast and secure option for obtaining and sending information to a database in real time, not requiring storage or discarding of printed paper. About the

statistics software, in most cases it presented itself with agility and reliability in the analysis made. It was also possible to verify that the error in filling out the questionnaires became almost nonexistent, as well as in data storage, because the Google Forms platform was a very safe tool, presenting no distortions in the data collected by the undergraduates in the research. It is worth mentioning that the time spent with the data analysis using the software was very short, increasing the efficiency of the research. From this, the use of tools that can act as facilitators for the research is increasingly a reality in the scientific academic environment. Soon, printed papers will be totally replaced by online questionnaires and one can say that the calculator, pen and paper, have already been replaced by statistics analysis software.

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