



The influence of the virtual learning environment (vle) in the deadline mode on therapeutic adherence and the effect of the hypertensive white jacket

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ABSTRACT

OBJECTIVE

Hypertension (AH) is a risk factor for cardiovascular diseases and health education associated with educational technology can be used to improve adherence behavior. To evaluate the influence of educational strategy in an individual guidance program associating educational technology in the virtual learning environment (VLE) in the Distance Learning (DL) modality for hypertensive patients to be promoted by nurses and to verify the effect of the white coat and the quality of life in patients at a state in São Paulo.

METHODS

Randomized clinical study with AVA Group (study group, 10 patients) and Control Group (16 patients). Both groups participated in six consultations with the nurse during 120 days with intervals of 20 days. At the beginning of the study (randomization) and at the end, the following instruments were applied: Morisky test and WHOQOL and Ambulatory Blood Pressure Monitoring (ABPM) was performed. Only the study group had remote access to the VLE, consisting of six specific educational modules, with release at each meeting.

RESULTS

There was no statistical significance between the two groups regarding sociodemographic and hemodynamic variables. There was statistical significance at the end of the study between the groups in the Morisky Test ($p = 0.001$) and in the WHOQOL Social Domain 3 ($p = 0.001$) favorable to the AVA Group. As for the effect of the white coat, there was no reduction in the phenomenon at the end of the study.

CONCLUSIONS

The strategy promoted an improvement in adherence behavior in the AVA Group.

DESCRIPTORS

Therapy adherence, White coat hypertension, Health Technology Education, Nursing.

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RESUMO

OBJETIVO

A hipertensão arterial (HA) é um fator de risco para doenças cardiovasculares e a educação em saúde associada à tecnologia educacional pode ser utilizada para a melhoria do comportamento de adesão. Avaliar a influência de estratégia educacional em um programa de orientação individual associando tecnologia educacional no ambiente virtual de aprendizagem (AVA) na modalidade de Ensino a Distância (EAD) para hipertensos a ser promovido por enfermeiros e verificar o efeito do avental branco e a qualidade de vida em pacientes de um hospital estadual em São Paulo.

MÉTODOS

Estudo clínico randomizado com Grupo AVA (grupo de estudo, 10 pacientes) e Grupo Controle (16 pacientes). Ambos os grupos participaram de seis consultas com o enfermeiro durante 120 dias com intervalos de 20 dias. No início do estudo (randomização) e no final, foram aplicados os seguintes instrumentos: Teste de Morisky e o WHOQOL e realizada a Monitorização Ambulatorial da Pressão Arterial (MAPA). Apenas o grupo de estudo teve acesso remoto ao AVA, constituído de seis módulos educacionais específicos, com liberação a cada encontro.

RESULTADOS

Não houve significância estatística entre os dois grupos em relação às variáveis sociodemográficas e hemodinâmicas. Houve significância estatística ao final do estudo entre os grupos no Teste de Morisky ($p = 0,001$) e no WHOQOL Domínio Social 3 ($p = 0,001$) favorável ao Grupo AVA. Quanto ao efeito do avental branco não observou redução do fenômeno ao final do estudo.

CONCLUSÃO

A estratégia promoveu melhoria no comportamento de adesão no grupo AVA.

DESCRITORES

Adesão terapêutica, Hipertensão do jaleco branco, Tecnologia Educacional, Enfermagem.

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INTRODUCTION

Systemic Arterial Hypertension (SAH) is a multifactorial clinical condition characterized by a sustained increase in blood pressure levels greater than or equal to 140 and / or 90mmHg. It has become a common public health problem worldwide due to the increased longevity of the population. It can be associated with metabolic disorders, functional changes of target organs, in addition to the risk of diseases when associated with diabetes, dyslipidemia and obesity¹.

The prevalence of SAH among North American adults (older than 20 years) increased to 32.6% between 2009 and 2012, which is equivalent to an estimated 80 million hypertensive adults. An aggravating fact is that 17.2% of these cases are unaware that they are hypertensive. Epidemiological projections indicate that in 2030 approximately 41.4% of American adults will be hypertensive, an increase of 8.4%². In Brazil, SAH affects about 32.5% (32 million) of adults, 60% of whom are elderly and contributes to 50% of deaths from cardiovascular disease¹.

The prevention of SAH requires changes in the individual and social lifestyle, through a collective effort to encourage the practice of physical activity, healthy eating, smoking cessation, alcoholism, and treatment adherence³. The treatment of patients with SAH also includes treatment non-pharmacological as physical activity and diet and use of specific drugs^{1,2}.

Multiple dimensions are recognized that involve therapeutic adherence indicate that regular monitoring of hypertensive patients is one of the great current challenges. It should also be considered that adherence is a process subject to various factors such as: personal and social conditions, chronicity, side effects, access to health services, among others⁴.

Low adherence often negatively affects the patient's clinical evolution and increases the risks of morbidity and mortality due to events such as stroke, acute myocardial infarction (AMI), heart failure (HF) and kidney disease chronic. These complications compromise productivity at work, family income and lead to a high frequency of hospitalizations and disability, in addition to the risk of sudden death¹.

The lack of adequate control of SAH can compromise the physical, emotional and intellectual state due to symptoms that limit the performance of daily activities causing financial difficulty, low self-esteem, feeling of incompetence and social isolation. Thus, the quality of life of the hypertensive patient is directly related to the way in which blood pressure is controlled and can negatively impact the individual's ability to manage his / her condition as a chronic disease⁵.

The members of the multiprofessional team who measure blood pressure must be able to predict conditions that rule out the possibility of error that can compromise the diagnosis of hypertension in addition to the antihypertensive therapeutic approach. One of the sources of error is the well-known

phenomenon of the White Apron Effect (EAB) or White Apron Hypertension (HAB), which during the observer and patient interaction causes falsely altered values between the measurements performed in the office and those obtained by the Ambulatory Monitoring of Blood Pressure (MAPA) and MRPA Home Blood Pressure Monitoring (MRPA). The experiments carried out by Mancia et al. (1987)^{6, 7, 8} proved that the alert reaction was more attenuated when blood pressure was measured by nurses, when compared with the values obtained by the doctor.

The White Coat Effect, a phenomenon described by Pickering⁷ occurs when the difference in BP obtained in the office and outside is observed, if the difference is equal to or greater than 20 mmHg in the Systolic Arterial Pressure (SBP) and 10 mmHg in Diastolic Blood Pressure (DBP). White coat hypertension (WCH) occurs when the patient has persistently high BP averages (above 140x90mmHg) in the office and BP averages considered normal at home. Masked Hypertension, on the other hand, is characterized by normotension values of BP in the office (<140x90mmHg), however BP is elevated in MAP¹.

Interventions to control chronic diseases should consider knowledge about causes, diagnoses, treatments, and health promotion strategies that invest in the subject's autonomy in relation to the health / disease process⁹. Health education is centered on the dialogue between professionals and users of the health system that allows the construction of knowledge and increases the autonomy of these people in their care¹⁰.

It is considered that communication between nurse and patient is fundamental in health promotion aiming to improve the behavior of adherence and control of blood pressure. Both the use of technology and education in health promotion are important for the search for behavioral changes¹¹.

Currently, health teams need to incorporate educational skills that are essential for the development of the work process with a focus on the care of chronic non-communicable diseases to establish knowledge exchange, reality transformation and comprehensive health care¹⁰.

Educational technologies can be used creatively with hypertensive patients, encouraging commitment and interaction. It encompasses the existence of a dynamic work object in a continuous moment. One of the focuses may be the decentralization and individualization of the teaching - learning process through distance learning (DL)^{12,13}.

With the expansion of the construction and use of technological resources in several areas of knowledge, including health, this study aimed to promote health education through distance education. Virtual learning environments (VLE) allow the promotion of knowledge to its participants through access to the internet on computerized platforms. They have a website format with wide coverage for all individuals, hypertensive or not, with access to the internet¹⁴.

Several strategies have been adopted to promote the effective adherence of hypertensive patients to pharmacological and non-pharmacological treatment. Considering the current Brazilian scenario of chronic non-communicable diseases, an intervention proposal for health promotion was developed with a focus on the virtual learning environment (VLE).

This work assesses the influence of educational technology in the Distance Learning (DL) modality in the Virtual Learning Environment (VLE) "Hypertension E-Care" on therapeutic adherence in hypertensive patients with difficult control of blood pressure levels and also evaluates the Phenomenon of the White Apron of hypertensive patients regarding the use of the VLE "E-Care of Hypertension" in the distance education modality.

METHODS

It is a Randomized Clinical Trial carried out from December 2014 to April 2015. An experimental study with human beings that aimed to know the effects of health interventions, thus evidencing clinical practice. 26 eligible patients were included, according to the order of care for new cases enrolled in the Outpatient Clinic of the Hypertension Unit of the Instituto do Coração in the Hospital das Clínicas Unit of the USP Medical School (InCor FMUSP). The selected sample was for convenience according to the accessibility to the web and after the patients' consent through the Free and Informed Consent Term (IC) approved by the Research Ethics Committee InCor-FMUSP. It is a subproject of the project entitled: "Adherence of hypertensive patients to treatment: the use of therapeutic communication associated with educational technology in health promotion", submitted through the Brazil Platform 08625112.7.0000.0068 and approved by the Ethics Committee in Research with opinion: 164,092 and reporting date 12/05/2012. Project developed by the research group of the Hypertension Unit of the Instituto do Coração of the Hospital das Clínicas of the Faculdade de Medicina USP, with funding from the São Paulo State Research Support Foundation (FAPESP 2012-50559-1).

Inclusion criteria were patients on a therapeutic regimen with medical follow-up; blood pressure levels equal to or greater than 140 mmHg for systolic blood pressure (SBP), and equal to or greater than 90 mmHg for diastolic blood pressure (DBP); the age in the range of 21 to 60 years. Exclusion criteria were considered patients with significant cognitive limitation and unable to access the web digitally.

The AVA Group Study Group was composed of 10 hypertensive patients, who, in addition to the routine medical consultation, were submitted to nursing monitoring every 20 days and were guided through the AVA "E-Care of Hypertension" in the distance modality. At the zero consultation, the adherence behavior profile was evaluated with the patient's identification record, medical diagnosis, risk factors for disease and drug therapy. Application of the WHOQOL-BREF¹⁵ surveys and Morisky Green Test^{16, 17} and referral for the performance of Ambulatory Blood Pressure Monitoring (MAPA). In all consultations, blood pressure was measured with an automatic OMRON-HEM 705CP¹⁸ device, anthropometric assessment (weight, height and waist circumference), recorded in a collection instrument including identification, registration of complaints and actions taken, and note was taken receipt of empty blisters for counting pills. After each nursing consultation, remote access to distance education modules was allowed. The registration of patients was performed with the CPF and email, making it possible to release the modules for access after each consultation.

The "Hypertension E-Care"^{19, 20} had a "Storyboard" navigation script, composed of 6 learning modules, and at the end of each module, knowledge assessment was carried out to sediment the newly acquired content. The validation of the Portal was carried out by the multidisciplinary team structured with the Department of Telemedicine FMUSP and the Department of Distance Learning (EAD) of the Centro Universitário São Camilo.

The Control Group was composed of 16 hypertensive patients, who, in addition to routine medical follow-up, participated in nursing consultations with conventional guidance without the use of the Hypertension E-Care Portal. Thus, as described in the study group, the same protocol was followed with MAPA, application of surveys, monitoring of blood pressure and anthropometric assessment.

For the calculation of the sample, the confidence coefficient, the sample error, and the population size demonstrated

by the following formula were considered:

$$n = \frac{Z^2 \cdot \hat{p} \cdot \hat{q} \cdot N}{d^2(N-1) + Z^2 \cdot \hat{p} \cdot \hat{q}}$$

Where:

n - sample size.

Z - critical value for the desired degree of confidence, usually:

d - standard deviation, usually: ± 5% of the proportion of cases (absolute precision), or ± 5% of the average (1.05 × average).

N - population size (finite).

p - prevalence.

q - complementary to prevalence (100-p).

For the sample calculation, the universe of 6000 hypertensive patients, enrolled in the outpatient clinic of a state public hospital in the state of São Paulo at the tertiary level was considered. To find significant differences in the proportions of the presence of the effect of the white coat, between two groups, the confidence interval of 80.0% with a probability of error of 20% was considered. In this way, the number of 11 individuals per group was estimated.

The collected data were analyzed, and the descriptive statistics were presented by means of graphs and tables, containing absolute numbers and percentages. As for repeated measures related to continuous variables, such as blood pressure values, comparisons of measurements were made during the follow-up. As for the comparisons of the measures between the groups, initially, the assessment of the homogeneity of the groups regarding the relevant information that could interfere in the treatment result. For that, the quantitative data were summarized through the minimum and maximum values, median, mean, standard deviation and error. For qualitative data, tables of absolute and relative frequencies were constructed.

For the variables systolic and diastolic pressures, the average behavior over the evaluation conditions, in the groups, the differences observed were evaluated by the Student's T test for independent samples. The same test was used to assess the differences between the moment of randomization and at 120 days in relation to the variation relative to baseline and for the measures measured in the ABPM in the waking and sleep assessments.

For the comparison of the median of the variables between the groups regarding the Morisky test, the Mann-Whitney test was used. For the quality-of-life score obtained by WHOQOL regarding the physical, psychological, social, and environmental domains (gross, transformed and computed), the Student's t test was used for independent samples.

RESULTS

Main Characteristics of the Studied Population

As for the population in the AVA Group, 70% (7) were women, 70% declared themselves to be white, 70% were Catholic and 60% had completed high school (6). As for the average age, in the AVA Group it was around 52 ± 7 years and in the Control Group 55 ± 13 years. In the Control Group, 75% (12) 62.5% considered themselves to be white (10), 93.8% of the predominant religion was Catholic (93.8%) (15) and only 25% (4) with an educational background of complete high school.

The AVA Group and the Control Group do not present statistically significant differences in relation to the anthropometric data (Table 1).

Table 1. Characterization of Anthropometric Data according to the AVA Group (10) and Control Group (16): São Paulo, 2017.

| CLINICAL DATA | AVA GROUP | CONTROL GROUP | P value |
|------------------------------------------|--------------|---------------|---------|
| Weight (Kg) at randomization | 75,405±7,63 | 83,28±18,46 | 0,238 |
| Weight (Kg) at 120 days | 74,40±14,74 | 81,32±18,28 | 0,324 |
| Abdominal circumference at randomization | 95,9 | 101,8 | 0,188 |
| Abdominal Circumference at 120 days | 92,60±±12,70 | 100,81±17,53 | 0,212 |
| Height (cm) | 160,40±±7,63 | 159,94±6,47 | |
| BMI at randomization | 29,42 | 32,28 | 0,224 |
| BMI at 120 days | 29,02±6,22 | 31,57±5,89 | 0,303 |

Characterization of Treatment Adherence

The Morisky test demonstrated that both groups at the time of randomization were similar. However, at the end of 120 days, it is observed that only for the AVA Group there was an improvement with statistical significance, by demonstrating that there was an improvement in adherence behavior.

Characterization of Quality of Life - WHOQOL

The quality-of-life results obtained through the WHOQOL BREF demonstrate that there was no significance when comparing the Control Group at the time of randomization and at 120 days. For the AVA Group, there was a significant improvement in Domain 3 (Social).

Blood Pressure Behavior Throughout Assessments

Systolic blood pressure (SBP) was above the desirable levels: 166.10 ± 26.41mmHg and 143.06 ± 28.84mmHg, respectively in the AVA Group and the Control Group at randomization in both groups (Figure 1), the same was identified for diastolic blood pressure (DBP) (Figure 2), 91.60 ± 19.49mmHg and 89.91 ± 12.12mmHg in the AVA Group and the Control Group, respectively. There was no statistically significant difference between the values of SBP (p = 0.908) and DBP (p = 0.052) at the time of randomization, that is, the groups were similar.

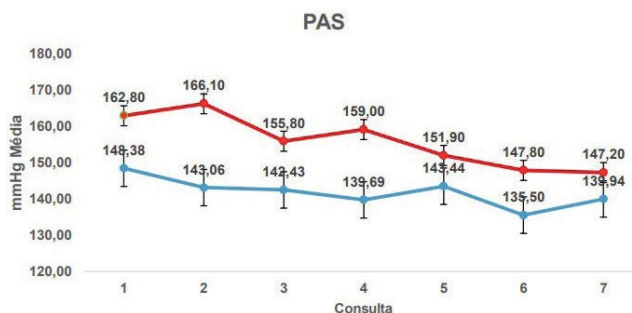


Figure 1. Mean values of systolic blood pressure (SBP) during follow-up 120 days for AVA Group (10) and Control Group (16).

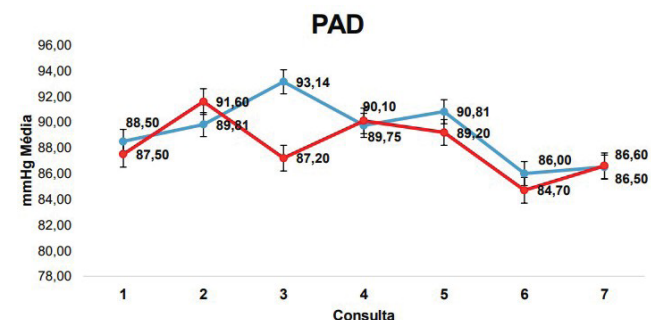


Figure 2. Mean values of diastolic blood pressure (DBP) during the 120-day follow-up for AVA Group (10) and Control Group (16).

According to the descriptive analysis, when analyzing the difference between the averages in the Study Group, it was identified that there was an important drop in SBP after 40 days of follow-up, that is, in consultation 2, maintaining a drop of around 10 mmHg at each consultation. until the end of the study. In the Control Group, PAS also fell over the course of the follow-up, but not as expressive. In relation to the PAD in the Control Group, it showed an increase at 40 days of follow-up in consultation 2, while in the Study Group there was a tendency to keep falling until 120 days.

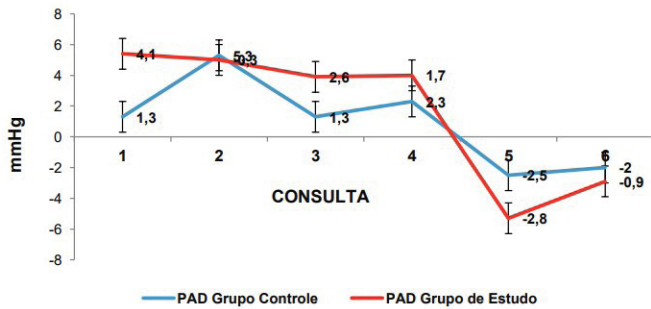


Figure 3. Differences between the mean systolic blood pressure (DBP) during the 120-day follow-up for the AVA Group (10) and the Control Group (16).

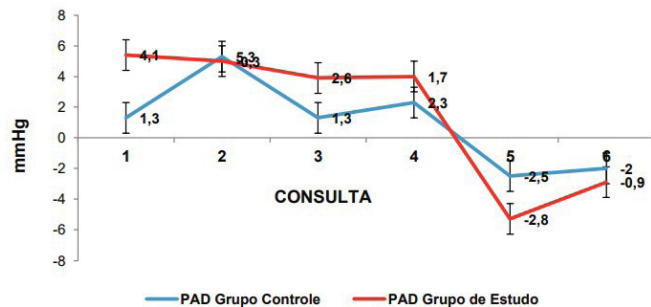


Figure 4. Differences between the mean diastolic blood pressure (DBP) during the 120-day follow-up for the AVA Group (10) and the Control Group (16).

At the end of the follow-up, although both groups had a decrease in the mean BP values, there was no statistical difference between the groups for SBP and DBP in relation to the mean values and also in relation to the differences between the means.

Results Obtained by Ambulatory Blood Pressure Monitoring (ABPM)

The AVA Group (10 patients underwent the first and second ABPM) and the Control Group (15 patients underwent the first and second ABPM - with the loss of just one exam). At the time of randomization, they had mean SBP values of 150.80 ± 17.39mmHg and 138 ± 21.69mmHg, respectively, in the AVA Group and the Control Group during the waking period. DBP 88.30 ± 17.35mmHg in the AVA Group and 82.50 ± 12.29mmHg in the Control Group. As for the sleep period, the groups had similar mean systolic and diastolic blood pressure: SBP 135.60 ± 16.06mmHg in the AVA Group and 132.38 ± 24.98mmHg in the Control Group and for DBP 72.90 ± 21.37mmHg and PAD 75.75 ± 15.96mmHg respectively in the AVA Group and the Control Group.

At 120 days, the following mean values for SBP were found: 136 ± 10.23mmHg and 136.33mmHg in the wake period, as for DBP, the mean was 82.30 ± 10.71mmHg and 81.93 ± 11, 02mmHg respectively for the AVA Group and the Control Group. In the PAS sleep period 127.80 ± 12.77mmHg and 130.47 ± 27.17mmHg, as for the DBP it was 73.30 ± 7.30mmHg and PAD 75.47 ± 15.73mmHg respectively for the AVA Group and the Control Group.

Characterization of the White Coat Effect

For this study, the White Apron Effect (EAB) was evaluated, which consists of the difference in BP between the measurements obtained in the office and outside of it is called EAB, when its values are, respectively, positive or negative, differences equal to or greater than 15 mmHg in SBP and / or 9 mmHg in DBP indicate significant EAB.¹ Therefore, when measuring BP obtained in the office, it must be kept in mind that WCH may be present mainly in stage 1 hypertensive patients or in pre-hypertensive patients because, contrary to what was imagined, both WCH and MH are associated with higher cardiovascular mortality²¹.

This is the primary response seen as an alert reaction, characterized by the physiological response to a condition or event that may represent a threat, triggering the classic escape response. This condition is usually present in a portion of the population and can cause inaccuracy in the measurement values of BP in the office^{21, 22, 23, 24}. However, as a result of the study, the second outcome was to assess whether Technological Education could mitigate this response.

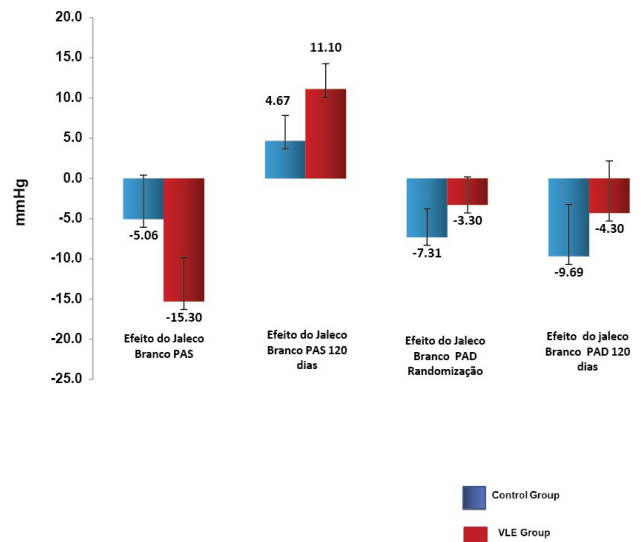


Figure 5. Effect of the White Coat for PAS and PAD at the beginning of the study on randomization (zero consultation) and at the end (after 120 days) in the AVA Group (10) and in the Control Group (16) - São Paulo, 2015.

According to Figure 5, in relation to the Effect of White APRON (EAB) it was observed that for both groups there was no statistical significance at the time of randomization and at 120 days. In the AVA Group, the mean for SBP was -15.30 ± 22.21mmHg at the beginning of the study and 11.10 ± 19.96mmHg at 120 days. For DBP, the mean was 3.30 ± 8.90mmHg at randomization and -4.30 ± 10.07mmHg at 120 days in the AVA Group. In the Control Group, the mean for SBP was -5.06 ± 21.89mmHg at randomization and 4.67 ± 12.24mmHg at the end of the study and for DBP -7.31 ± 13.99mmHg and -9.69 ± 25, 86mmHg, respectively at randomization and at 120 days.

According to the definition postulated for EAB for this study, the distribution of individuals who presented this reaction was equitable between the Control Group and the Study Group, comparing at the beginning of the study and at the end of the follow-up (Control Group PAS - 9 vs 5 individuals - PAD 9 vs 8 individuals / Study Group PAS 7 vs 6 individuals - PAD 3 vs 5 individuals), Given this result it is observed that the use of Educational Technology did not influence the attenuation of the EAB response.

Characterization of Access to the Hypertension E-care Portal by the AVA Group

Table 2. Access numbers to the Hypertension E-Care Portal (number of absolute access and percentage) over the 120-day follow-up divided into 6 modules in the AVA Group (10) - São Paulo 2017.

| Module | Access number N | Number % | Number of hits N | |
|--------------------------------------|-----------------|------------|------------------|------------|
| | | | N | % |
| 1: How SAH affects the body | 7 | 70 | 10 | 9 |
| 2: Guidelines and patient support | 5 | 50 | 3 | 80 |
| 3: Eat well to live well | 5 | 50 | 7 | 100 |
| 4: Physical activity in favor of SAH | 5 | 50 | 2 | 100 |
| 5: Stress mistreats the heart | 4 | 40 | 4 | 75 |
| 6: Script behavioral situations | 4 | 40 | 4 | 63,75 |
| TOTAL | 30 | 100 | 30 | 100 |

Regarding access to the Hypertension E-care Portal, seven patients (70%) were included in the distance learning modality. At the end of the follow-up at 120 days, only 4 (40%) patients maintained assiduous access to the portal. In each module there were activities to be performed by patients with their respective total score for assessing performance at each moment. The modules that achieved the highest performance with 100% utilization were: Module 3 - "Eating well to live well", Module 4 - "Physical activity in favor of SAH", followed by Module 2 - "Guidelines and patient support" with 80% of utilization. Module 5 - "Stress mistreats the heart" reached 75% of use. Module 6 - "Roadmaps of behavioral situations" achieved 63.75% of use. Module 1 - "How SAH affects the body", on the other hand, showed the lowest utilization of only 9%.

DISCUSSION

The population in question randomized in the two studied groups was similar in terms of demographic and clinical characteristics. Predominantly female for both groups, the average age in the AVA Group was around 52 ± 7 years and in the Control Group 55 ± 13 years. The largest proportion of patients for both groups were married, named themselves as white individuals, identified themselves as Catholics 70% and 93.75%, respectively in the AVA Group and the Control Group. As for education in the AVA Group, 60% had completed high school and 25% of the Control Group had completed high school.

Assessing quality of life today has become an important measure of health assessment. As it has a cross-cultural character, the use of WHOQOL values the individual perception of each person, allowing the assessment of quality of life in different groups and situations. With this, it is possible to rescue the perceptions, desires and expectations of the population. The quality of living well is composed of elements such as standard of comfort and well-being, as well as the individual's perception of their position in life, culture, society's values and the relationship with their goals, expectations, standards and concerns²⁵.

It is important to highlight that in the AVA Group there was an improvement in quality of life with statistical significance at the end of the study at 120 days in Domain 3 - Social. As for the Control Group, there were no statistically significant differences for WHOQOL. With this positive result for the AVA Group, it can be said that distance technological education provided this result, which may represent a positive point in

the influence of the use of the AVA E-care website for this population. The rigor in the collection and the assertive use of the choice of the tool to evaluate the effects of the VLE was a sensitive marker for the scientific evidence to confirm the original hypotheses of the study.

Various factors can trigger non-adherence to medications. Epidemiological studies^{26, 27, 28, 29, 30} point out as main factors: socioeconomic, low income and low education. Assistance factors, on the other hand, include the number of medications consumed and non-attendance at medical appointments. But this study showed that when analyzing therapeutic adherence through the Morisky Test, it was observed that in the AVA Group there was an improvement with statistical significance. On the other hand, in the Control Group patients, no statistically significant results were observed. Therefore, for the AVA Group it was identified that the improvement occurred for the forgetfulness behavior for taking medication.

Regarding the behavior of blood pressure throughout the evaluations, although there were no statistically significant results, both groups had a reduction in the values of systolic blood pressure in absolute numbers. The number of subjects in the research may have been the main limitation of the study to obtain robust results.

Although this study did not obtain effective results from the point of view of statistical analysis, for the effective control and reduction of SBP and DBP, it proved to be of great utility and relevance to test new strategies in the field of health education, pointing out new paths for adherence therapy.

The study showed that the Control Group benefited from the attention given during nursing consultations with the improvement of the state of anxiety, even without having participated in the intervention through the "Hypertension E-Care" Portal. The data indicate that, as in other studies^{31, 32}, the number of consultations and the habituation in the measurement of blood pressure by nurses favored the improvement of blood pressure control and decreased the effect of the white coat.

Technological advances are undoubtedly essential for health professionals. However, its development, use and evolution must focus on the convergence between human and technological development, always focusing on the person-person relationship. The technology adopted cannot replace the relationship and subjective understanding between human beings. The capacity for empathy, identification, openness, projection, generosity, and solidarity is expressed in the relationship of communion, exchange, and interaction between beings³³.

The analysis made by MAPA at the beginning and at 120 days of the study showed only one trend, without statistical significance, of being the biggest drop in blood pressure in the AVA Group, compared to that of the Control Group. Therefore, MAPA was not sensitive enough to detect the benefits produced by distance education through the "Hypertension E-care". No entanto a construção do portal "E-care da Hipertensão" pode ser útil e promover melhorias, facilitando o desenvolvimento de um plano de ação para o futuro, com vista a aplicabilidade para fins educacional.

On the other hand, the study showed that of the 6 VLE modules, the most accessed was the first (how SAH affects the body) and the least accessed was the sixth (Behavioral situations script). Applying the Pareto principle, 80% of the accesses were made including modules 1, 2, 3 and 4. While the percentage of correct answers to the questions asked was lower in module 1 (9% of correct answers). For modules 3 and 4 the percentage was 100%. Responses to modules 3, 4, 2 and 5 comprise more than 80% of correct answers. Thus, modules 1 and 6, as the questions asked, need revision to improve their content and understanding by patients.

CONCLUSION

The data set indicates that in hypertensive patients followed for 120 days undergoing VLE through EAD, although when analyzing the primary outcome (blood pressure measurement) there was no statistical significance between the groups. However, when patients in this group were compared between the time of randomization and at the end of 120 intergroup days, statistical significance was identified, whereas for the Control Group, the same did not occur. And when examining the Morisky Test in the AVA Group, there was significance for improving the forgetfulness behavior for taking the medication. Another important aspect that demonstrated a positive result was the improvement of the quality of life for Grupo AVA in Domain 3 - Social.

Therefore, it can be stated that, for the population studied, the use of educational technology used remotely in the distance learning modality can be considered beneficial to promote improvement in the behavior of adherence, as a strategy for the prevention of health problems.

Study limitations: During the follow-up, no anchoring was performed to guarantee access to the Hypertension AVA E-Care during consultations, as the objective was to assess the influence of AVA on therapeutic adherence and the effect of the white coat. Another point that was not possible to assess was how much the patient retained knowledge of the VLE, as such assessment was not part of the research objectives. Access to the VLE may have been impaired, that is, even offering tools for access at home, the patient in some circumstances may not make use of the tool due to self-care, as it does not present satisfactory adherence behavior.

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