

The Health Education Program Implemented by Nurses Can Improve Blood Pressure Control and Quality of Life in Hypertensive Patients?

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Abstract: The relational strategies in group are to improve patient's BP (blood pressure) control and QoL (quality of life). Methods: Twenty-one hypertensive patients were randomized into two groups: group A (10 patients, age 67 ± 6 years, BMI (body mass index) 28.3 ± 6 kg/m²) was applied relational strategies, with meetings every 15 days 8 meetings; group B (11 patients, age 58 ± 13 years, BMI 28.2 ± 3 kg/m²) with meetings for group orientation every 40 days 3 meetings. The patients were monitored: at baseline (day 15) and at the end of the study (day 120), the BP was measured by auscultatory method and the QoL questionnaire (WHOQOL-BREF) was applied, and was submitted to the examination with ABPM (ambulatory blood pressure monitoring). Results: after 120 days there was a greater ($p < 0.05$) reduction in SBP (systolic blood pressure) in group A (37.8 ± 25 mmHg) than in group B (18 ± 9 mmHg), but DBP (diastolic blood pressure) decreased similarly in both groups (A, 15 ± 21 vs B, 13 ± 14 mmHg); the HR (heart rate) reduction was larger ($p < 0.05$) in group A (60.6 ± 8.9 bpm) than in group B (69.7 ± 10.7 bpm). There was a more significant BMI decrease ($p < 0.01$) in group A (27.8 ± 5 kg/m²) than in group B (28.9 ± 4 kg/m²). The observed correlations between physical domain and nighttime DBP (at day 120) in ABPM were $r = -0.712$ (negative correlation, $p = 0.003$); between psychological domain and SBP sleep time (at day 120) in ABPM were $r = -0.527$ (negative correlation, $p = 0.044$); between environmental domain and daytime Δ HR in ABPM were $r = -0.573$ (negative correlation, $p = 0.007$). Conclusion: the health education program conducted through interpersonal relationships within groups provided better control of SBP and greater reduction in BMI.

Key words: Hypertension, nursing, health education, adherence therapy.

1. Introduction

Arterial hypertension is a public health problem and adherence to treatment is a challenge to the health care team. The current definition proposed for adherence is the extent to which the patient's behavior coincides with the doctor's recommendation or with advice from other health care professionals, which with respect to

the medication prescribed, changes in lifestyle habits, health diet, practice physical activity, avoid alcohol and tobacco, or frequency of medical visits [1].

A review of the literature on interventions for increasing adherence to the antihypertensive treatment shows the need for further randomized clinical trials to assess the effect of interventions. Lewin et al. [2] discuss patient-centered care, a concept characterizing the approach in which patients share the responsibility for the decisions about health care management and in which their whole person is focused on, including

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their individual preferences, both within a social context.

Many hypertensive patients do not make the necessary changes in their lifestyle and do not take enough medication to bring the disease effectively under control.

The nurse, as the health care professional responsible for preventive and caregiving assistance, is in a position to improve adherence rates by guiding the patient toward self-help, lifestyle improvements, and thus to hypertension control. The professional nurse has been taking on an important role, given the relevance of educational actions, when coupled with the efforts of other professionals towards better control of hypertension [3].

Stromberg [4] emphasizes that health education has become a major component for maintaining treatment, since self-help increases adherence, QoL (quality of life), and reduces health costs. Orientation must be repeated and adjusted to the patient's abilities and needs, knowledge of which should be acquired beforehand.

When nursing assistance is provided, the nurse interacts with the patient the whole time by means of verbal or nonverbal communication. If caregiving is extended for a longer than usual period of time, especially in the case of chronic diseases or other disorders requiring prolonged care, both the nurse and the patient experience a range of phenomena, feelings, thoughts, and reactions, all of which may interfere beneficially in the communication process [5].

Thus, as the nurse assists the patient with a chronic degenerative disease, the use of therapeutic communication rooted in an effective interpersonal relationship between the patient and the professional caregiver may influence the patient's behavior leading the patient to ponder the circumstances and self-reflect. As different possibilities are considered, the patient will make the most appropriate choice for staying healthy, even if that means not to be treated.

According to an article published by Péres et al. [6],

it may be taken for granted that patients already know something about hypertension; therefore, what is of the utmost importance is how further knowledge is imparted to them. Emphasis is placed on some of the following points: (1) the instructor must have previous knowledge of the attitudes, beliefs, perceptions, thoughts, and habits of the hypertensive patient and be able to contextualize it regionally; (2) the patient's active participation in the treatment should be allowed and encouraged; (3) not only the health care professional's recommendations but also the patient's needs should be taken into consideration; (4) adequate communication and interaction between the patient and the health care professional should be established with an emphasis on dialogue, interaction, and reflection; (5) the hypertensive patient's cognitive and psychosocial aspects should be explored, and family involvement in the treatment should be sought.

Based on the aforementioned theoretical assumptions, this study aimed to test the impact of relational strategies on the hypertensive patient's control of arterial BP (blood pressure). The outcome of the present study is the finding that relational technology has a beneficial effect on hypertension control.

2. Objectives

The purpose of this study was to test whether group strategies implemented by nurses and aimed at developing interpersonal relationships in health education group meetings would improve the hypertensive patient's BP control and QoL.

3. Methods

The study was conducted with 21 hypertensive outpatients at a health institute specialized in cardiology. The patients were randomized into 2 groups as follows: study group (A) with 10 patients who attended group meetings every 15 days (8 meetings), and control group (B) with 11 patients who attended group meetings every 40 days (3 meetings).

The meetings were held over a 40-day period for orientation by a nurse using the interrelational approach.

3.1 The Group Interrelational Method

The active element in the learning process, which takes place in a dialogic relationship between the nurse and the patient, occurs in an egalitarian relationship. The strategy aimed at giving meaning to the patient's acquired knowledge and adding new layers of meaning to what was previously known, thus contributing to a better understanding of the situations derived from the health and disease binomial [7].

Adoption of a constructivist tendency grounded in the patient's own knowledge enabled the exchange of mutual experience by means of interrelational strategies. In the constructivist investigation, social interaction is crucial, for the individual internalizes cultural elements taken from the external world and constructs an intra-psychological universe. This particular approach originates from psychology and was developed by Vygotsky [8]. It contains three central ideas, which may be deemed the pillars of Vygotsky's [8] thought and are the following: (1) psychological functions have a biological base, because they are products of cerebral activity; (2) psychological functioning is founded on the social relationships between the individual and the external world and develops as a historical process; (3) symbolic systems are the mediators of the human-world relationship [9].

3.2 Materials and Inclusion Criteria

The inclusion criteria for the study population were as follows: (1) patient under treatment for hypertension; (2) DBP (diastolic blood pressure) equal to or higher than 90 mmHg, and SBP (systolic blood pressure) equal to or higher than 140 mmHg; (3) age from 25 to 75 years for both sexes.

Both the control group and the study group were given the same orientation (healthy lifestyle and

prevention of risk factors) and both consulted with a nurse at the beginning of the study (day 15) and at the end of the study (day 120), did the routine follow-up with physicians at the outpatient clinic of the hypertension unit, and attended 60-minute group meetings for orientation from a nurse. The brief version of the World Health Organization quality of life (WHOQOL-BREF) [10] questionnaire and the BDI (Beck Depression Inventory) were given at baseline (day 15) and at the end of the study (day 120) and were followed by BP measurements taken using the auscultatory method. Pill count and dispensation were carried out every 30 days. The ABPM (ambulatory blood pressure monitoring) was performed at the beginning of the study (day 15) and at the end of the study (day 120) according to the standards of the ABPM laboratory of the hypertension unit of InCor (oscillometric method—SpaceLabs 90207 monitor; SpaceLabs Healthcare, Inc., Redmond, WA, USA).

3.3 Ethical Aspects

The Ethics Committee of the Heart Institute, School of Medicine, University of São Paulo approved the study protocol under No. 779/05, and written informed consent for participation was obtained from all subjects according the Ottawa statement, recommendations for the ethical design conduct the need for research obtaining informed consent [11]. The study was registered in the clinical trial under the number NCT02036814.

3.4 Data Collection Instruments

The Portuguese language version of WHOQOL-BREF, validated for use in Brazil, consisted of 26 questions distributed into the following 4 domains: (1) physical; (2) psychological; (3) social; and (4) environmental. The BDI is an instrument widely used in clinical research [11] and has been translated into several languages and validated in several countries. The original scale

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encompassed 21 items, including symptoms and attitudes, with a 0 to 3 intensity range. The items refer to sadness, pessimism, a sense of failure, dissatisfaction, a sense of guilt, a sense of punishment, self-deprecation, self-accusation, suicidal ideas, crying outbursts, irritability, social withdrawal, indecision, body image distortion, work inhibition, sleep disorders, fatigue, loss of appetite, loss of weight, somatic worry, and reduced libido.

3.5 Statistical Analysis

The weight, gender, age, and BMI structural variables were analyzed for each of the groups (study group and control group) and compared. For testing intergroup homogeneity, the chi-square test was employed; for continuous variables, the Mann-Whitney test; and for the QoL indices and the Beck inventory, the Pearson product moment

correlation test. Results are presented as mean and standard deviation. The significance level was set at 5%. The calculations were made using the SSPS software for Windows, version 1.7 (SPSS Inc., Chicago, IL, USA).

4. Results

4.1 Structural Characteristics of the Study Population

The socioeconomic variables demographic were compatible with each other, but there was no statistical significance among the groups. (Table 1)

4.2 Clinical Arterial BP and HR (Heart Rate)

Fig. 1 shows there was no significant difference between group A and group B at randomization and at day 120 in mean values of both SBP and DBP measured using the auscultatory method. Group A's

Table 1 The age, sex, weight, height, and body mass index (BMI) variables of the study population.

Variables	Group A	Group B
Age	67 ± 6 years	58 ± 13 years
Male	2	4
Female	8	7
Weight	68.9 ± 20 kg	69.9 ± 12 kg
Height	1.69 cm	1.68 cm
BMI	28.3 ± 6 kg/m ²	28.2 ± 3 kg/m ²

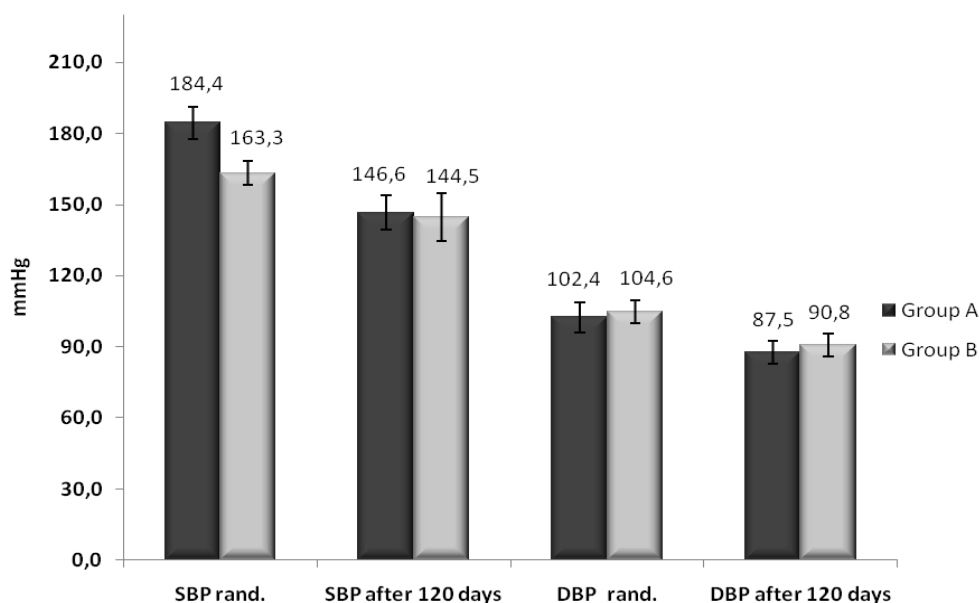


Fig. 1 Mean values of SBP and DBP of group A and group B at randomization and at day 120 (auscultation).

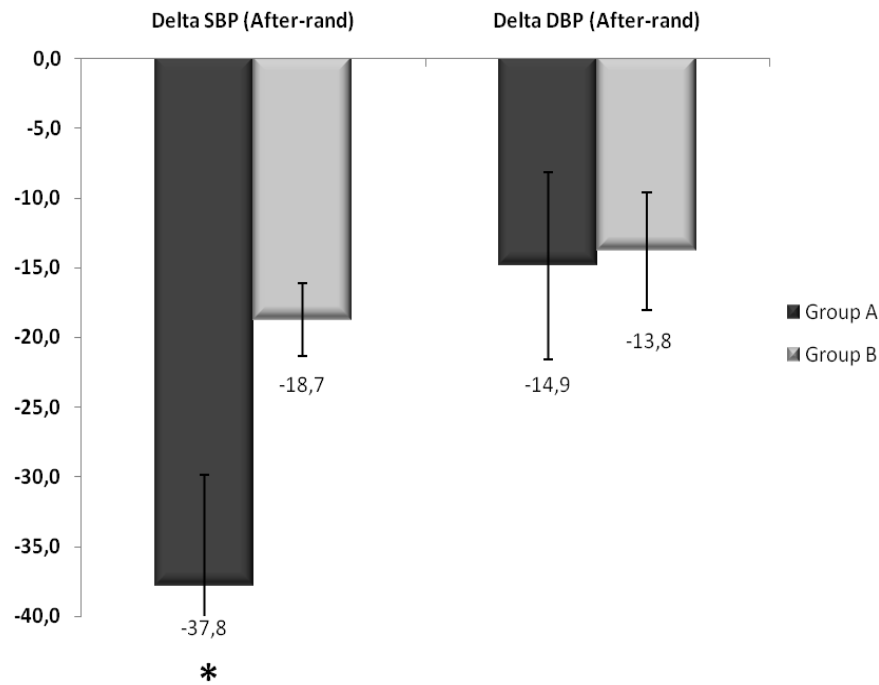


Fig. 2 The SBP and DBP behavior in group A and in group B at day 120.

*At day 120 there was a greater ($p < 0.05$) reduction in SBP in group A (37.8 ± 25 mmHg) than in group B (18 ± 9 mmHg).

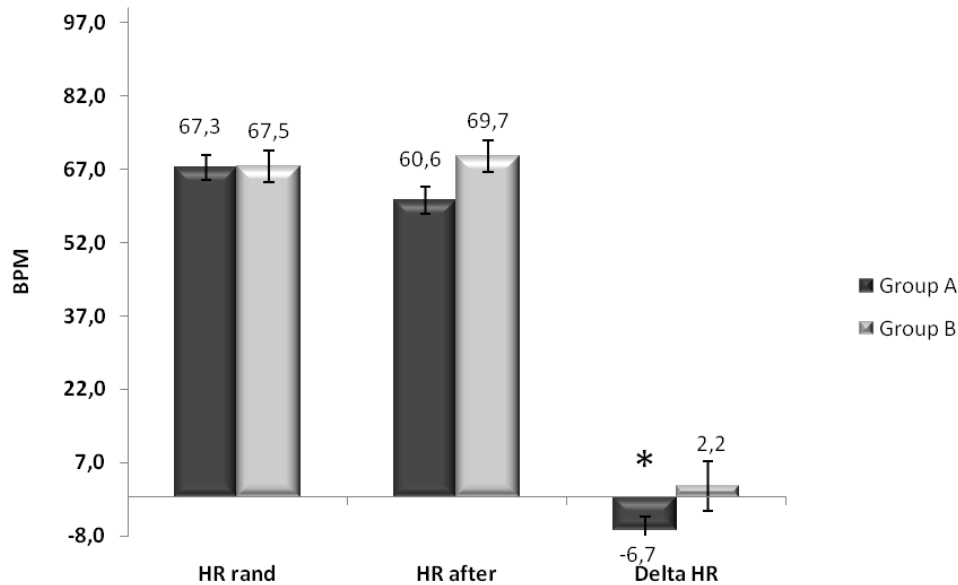


Fig. 3 HR in group A and in group B at day 15 and at day 120.

* The HR was lower ($p < 0.05$) in group A (60.6 ± 8.9 bpm) than in group B (69.7 ± 10.7 bpm) at day 120 ($p = 0.048$).

mean SBP at the beginning of the study was 184.4 ± 21 mmHg, and at the end, 146.6 ± 20 mmHg; their mean DBP initially was 102.4 ± 15 mmHg, and at the end, 87.5 ± 13 mmHg. Group B's mean SBP initially was 163.3 ± 17 mmHg, and at the end, 144.5 ± 16 mmHg; their mean DBP at the beginning was $104.6 \pm$

15 mmHg, and at the end, 90.6 ± 9 mmHg.

At day 120 there was a greater ($p < 0.05$) reduction in SBP in group A (37.8 ± 25 mmHg) than in group B (18 ± 9 mmHg), but DBP decreased similarly in both groups (Fig. 2).

The HR was lower ($p < 0.05$) in group A ($60.6 \pm$

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8.9 bpm) than in group B (69.7 ± 10.7 bpm) at day 120 ($p = 0.048$) (Fig. 3).

4.3 QoL Evaluation and the Beck Depression Inventory

The QoL global scores remained the same throughout the study (group A 3.5 ± 0.74 vs group B 3.8 ± 0.8) (Fig. 4).

There was a significant decrease ($p < 0.01$) in BMI in group A but not in group B (A, 27.8 ± 5 kg/m² vs B,

28.9 ± 4 kg/m²) (Fig. 5).

Table 2 shows the correlations between physical domain and nighttime DBP (ABPM) at day 120 ($r = -0.712$, $p = 0.003$); between Δ (QoL difference between baseline and day 120) psychological domain and median (difference between baseline and day 120) nighttime SBP (ABPM) at day 120 ($r = -0.527$, $p = 0.044$); and between Δ environmental domain and median daytime HR (ABPM) ($r = -0.573$, $p = 0.007$).

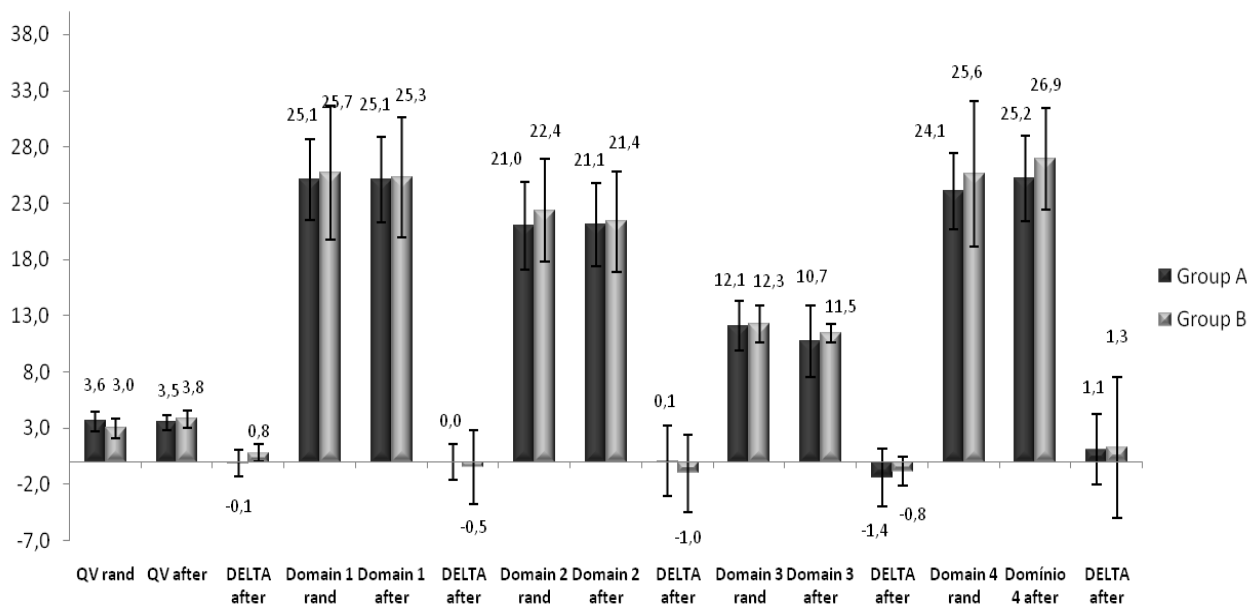


Fig. 4 Mean QoL scores of group A and group B at day 15 and at day 120.

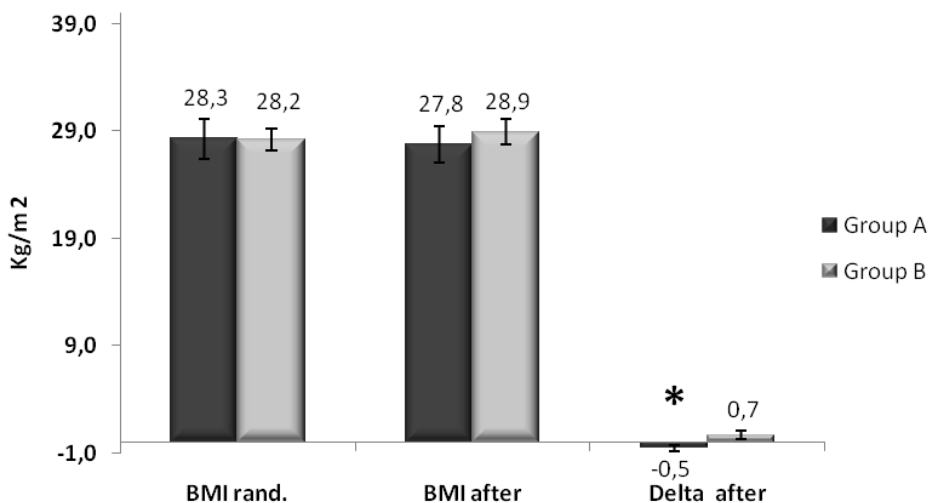


Fig. 5 Body mass index (BMI) of group A and of group B at day 15 and at day 120.

* There was a significant decrease ($p < 0.01$) in BMI in group A but not in group B (A, 27.8 ± 5 kg/m² vs B, 28.9 ± 4 kg/m²).

Table 2 The Pearson correlation and the significant study variables.

CORRELATION COEFFICIENT (RANGING BETWEEN -1 AND 1)	VALIDITY	COEFFICIENT	P VALUE
QOL (POST) AND THE BECK INVENTORY (POST)	21	-0,547	0,010
QOL AND Δ HR (POST)	21	0,530	0,042
QOL AND Δ SLEEPTIME SD DBP	21	-0,537	0,039
SBP SLEEPTIME AND Δ PSYCHOLOGICAL DOMAIN (POST-WOQOL)	15	-0.527	0.044
DBP SLEEPTIME (POST) AND PHYSICAL DOMAIN (POST-WOQOL)	15	-0.712	0.003
ΔHR DAYTIME(POST) AND Δ ENVIRONMENT DOMAIN (POST-WOQOL)	15	-0.573	0.007

5. Discussion

5.1 Comparison of BP and HR

This study has effective results to show with respect to a reduction in SBP values obtained by the auscultatory method (-37.4 mmHg) in the study group in relation to the control group (-18.7 mmHg). According to Lewington et al. (2002), for hypertensive patients aged 60 to 69 years, the additional reduction of 6.8 mmHg in SBP led to a 22% decrease in mortality by brain stroke and 17% by ischemic heart disease. Given the relevant reduction in BP values in the present study, the nurse is deemed a full member of the healthcare team with the ability to contribute to the improvement in BP values by means of interactional strategies.

This phenomenon essentially resulted from the interpersonal interaction established between healthcare professionals and patients. In the health-disease process, the healthcare professionals should respect the individual's autonomy. It is the individual who has the last say in behavioral changes as evidenced by the inversely proportional relationship between the ambulatory SBP measurements at nighttime and QoL in the psychological domain.

According to Oriá et al. [12] and Mazanec et al. [13], both agents in the interpersonal relationship should understand the communication signals, be their gestures, expressions, or words, so that the efficient and effective healthcare provided the patient by the nurse are realized as such by the patient. The relationship between these two agents first took root

during the group meetings, which were based on therapeutic communication aimed at establishing ties in order to help change lifetime habits. These ties may have a beneficial effect on the patient, as they engender care, which aggregates relational technology.

Adams and Carter [14], who promoted encounters between healthcare professionals and hypertensive and diabetic patients geared towards improving treatment adherence, suggest there are other approaches which may be adopted. Examples are the models based on the comprehension of behavioral change, such as the transtheoretical model of behavioral change. This model may help the healthcare professionals pay less attention to the patient's failures as they focus on the importance of interventions, expectations, and the patient's willingness to change [15].

Based on the studies of Raue et al. [16], the ties which are created are believed to aid in the incorporation of changes into one's lifetime habits. In the cardiac patient, they are believed to have a direct impact on weight reduction and thus on BP indices as well.

Guerra et al. [17] emphasizes that, according to his clinical experience and the results from his study, information gained through orientation programs positively influences adherence, but it is not sufficient for maintaining it. Much has been discussed about the importance of educational programs with respect to behavior changes in hypertensive patients; it should be noted that the nurse has a leading role in the

educational process.

5.2 Quality of Life Evaluation and the Beck Depression Inventory

In the 1990, the WHO (World Health Organization) recruited researchers from different countries in order to reach a consensual definition of QoL and develop an instrument which could measure it and be applied within the culture of each country. The first one was WHOQOL-100. Subsequently, by choosing the best questions from each facet, a new version was created, the WHOQOL-BREF, which produces a QoL profile in four domains: physical, psychological, social, and environmental [10].

In the present study, the latter version was validated to be used for the Brazilian population. However, at day 120, both groups had similar QoL indices; there was no statistically significant difference between them. This may be related to the general classification nature of the instrument. According to its author, Minayo [18], the population-based questionnaire does not specify pathologies, and thus it is more appropriate for epidemiological studies and the planning and assessment of healthcare systems. It is not ideal for quantifying the hypertensive patient's QoL. Another reason for no changes in the QoL after 120 days might have been the small study sample.

According to Oguma et al. [19], Amer et al. [20], Kaplan and Victor [21], Jahangir et al. [22], and Hu et al. [23], when normal-weight individuals are compared to the overweight, these have a higher risk of developing diabetes mellitus, dyslipidemia, and high BP, which are conditions favoring the development of cardiovascular diseases. There is a directly proportional relationship here. As a counterpoint, at day 120, the BMI in the study group was more reduced than in the control group.

For Willians et al. [24] and Cochrane [25], self-motivation and self-responsibility are important factors in the treatment of obesity. Motivation can be

generated by the interpersonal relationship between the nurse and the patient. This might have been the case underlying the BMI reduction in the study group. Another important correlation was between the drop in BMI and the drop in SBP.

6. Conclusions

The health education program based on group intervention through interpersonal relationships provided better control of SBP and greater reduction in BMI than the conventional approach by the nurse. Also, BP control correlated positively with improved QoL in the physical, psychological, and environmental domains, thus corroborating the superiority of the health education program.

What's New and Important?

Many strategies can be tested in hypertensive patients to improve BP control and support behavior change, this study demonstrates that relational technologies group associated with health education can contribute to achieve this goal.

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Contributions: Study concept and design: Guerra, Lopes and Bortolotto. Data collection: Guerra and Oliveira. Statistical analysis: Tsumemi. Drafting of the manuscript: Guerra, Vieira, and Lopes. Analysis of ABPM: Giorgi. Drug adjustment: Lopes, Consolim-Colombo, Giorgi, and Bortolotto. Critical revision of the manuscript: Guerra, Lopes and Bortolotto. The authors have no conflicts of interest to disclose.

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