

## Beliefs of people with salt intake-related heart failure

*Crenças de pessoas com insuficiência cardíaca relacionadas à ingestão de sal*

*Creencias de las personas con insuficiencia cardíaca relacionadas con la ingestión de sal*

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### ABSTRACT

**Objective:** to examine behavioral, normative, and control-related beliefs about reducing dietary salt intake in people with heart failure (HF). **Method:** this quantitative and qualitative study, guided by the Theory of Planned Behavior, was conducted from January to February 2018, through individual interviews of 26 people with HF in outpatient follow-up in the city of João Pessoa. Statistical and content analyses were applied. **Results:** maintenance of health and decreased appetite stood out, respectively, as positive and negative behavioral beliefs. Normative beliefs featured spouses, children and siblings as positive referents exerting greatest influence on salt reduction. Control-related beliefs included wife's preparation of meals making it easier, and tasteless food harder, to behave as expected. **Conclusion:** by examining beliefs it was possible to elucidate those needing to be strengthened or attenuated with a view to reducing salt intake for clinical control of HF.

**Descriptors:** Heart failure; hyposodic diet; behavior; social theory.

### RESUMO

**Objetivo:** analisar as crenças comportamentais, normativas e de controle relacionadas à redução do consumo de sal na dieta de pessoas com insuficiência cardíaca (IC). **Método:** estudo com abordagem quantitativa e qualitativa norteado pela *Theory of Planned Behavior*, realizado mediante entrevista individual com 26 pessoas com IC em seguimento ambulatorial, no período de janeiro a fevereiro de 2018, no município de João Pessoa. Foram aplicadas análises estatística e de conteúdo. **Resultados:** sobressaíram a manutenção da saúde e diminuição do apetite como crenças comportamentais positivas e negativas, respectivamente. Com relação às crenças normativas, cônjuges, filhos e irmãos apresentaram-se como referentes positivos que exercem maior influência na redução de sal. Quanto às crenças de controle, o preparo das refeições pela esposa facilita e a perda do sabor dos alimentos dificulta a execução do comportamento esperado. **Conclusão:** a análise das crenças permitiu elucidar aquelas que precisam ser fortalecidas e atenuadas frente à redução de sal para controle clínico da IC.

**Descritores:** Insuficiência cardíaca; dieta hiposódica; comportamento; teoria social.

### RESUMEN

**Objetivo:** analizar las creencias conductuales, normativas y de control relacionadas con la reducción de ingestión de sal en la dieta de personas con insuficiencia cardíaca (IC). **Método:** un estudio con enfoque cuantitativo y cualitativo guiado por la *Theory of Planned Behavior*, realizado a través de una entrevista individual junto a 26 personas con insuficiencia cardíaca en seguimento ambulatorio, de enero a febrero de 2018, en la ciudad de João Pessoa. Se aplicaron análisis estadísticos y de contenido. **Resultados:** el mantenimiento de la salud y la disminución del apetito se destacaron como creencias conductuales positivas y negativas, respectivamente. Con respecto a las creencias normativas, los cónyuges, hijos y hermanos se mostraron como referentes positivos que ejercen una mayor influencia en la reducción de sal. En cuanto a las creencias de control, la preparación de las comidas por parte de la esposa facilita y la pérdida del sabor de los alimentos dificulta la realización de la conducta esperada. **Conclusión:** el análisis de creencias permitió mostrar las que necesitan ser fortalecidas y atenuadas ante la reducción de sal para el control clínico de la insuficiencia cardíaca.

**Descriptores:** Insuficiencia cardíaca; dieta hiposódica; comportamiento; teoría social.

## INTRODUCTION

Among non-pharmacological measures prescribed in the clinical practice for people with heart failure (HF), restriction of salt/sodium intake is broadly oriented at different levels of health care<sup>1</sup>. However, evidence on their benefits and adverse outcomes remains inconclusive due to the variety of protocols, samples, and analysis methods, and further high impact investigations should be conducted<sup>2</sup>.

National Guidelines<sup>3</sup> and international guidelines<sup>4</sup> recommend to guide and educate people with HF to reduce their intake of high salt foods in their diets, this indication being individualized for clinical conditions, for example, the symptoms presented and pharmacological therapy used, especially the use of diuretics in order to minimize hypervolemia.

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The scientific literature indicates low adherence of people with HF to reduced dietary salt intake<sup>5,6</sup>. Lack of knowledge about how to make a low-salt diet, family interference and socialization in the preparation and ingestion of high-salt foods, the difficulty of choosing out-of-home meals, and the low palatability of foods prepared with high salt content. Low salt are factors described for non-adherence to diet follow-up<sup>7</sup>. Thus, it is relevant that the development of care technologies that favor adherence to health protective measures be anchored in consistent theoretical models that can explain the determinants that influence a specific behavior.

In this sense, we highlight the *Theory of Planned Behavior* (TPB) used to understand, explain and predict human behavior in specific groups and contexts. For theory, behavior is determined by intention (motivation) to act (effect behavior) and the perception of control over behavior. Intention is made up of three factors: attitude, subjective norm, and perceived behavioral control<sup>8</sup>.

International studies demonstrate the concern to identify the determining factors for the execution of the investigated behavior<sup>5,9</sup>. In Brazil, research aimed at unraveling the beliefs of people with HF in the light of the TPB is incipient. Therefore, it is essential to identify the beliefs that precede the determinants of behavior. In addition, the elucidation of beliefs constitutes the first stage of the theoretical framework for the development of measurement tools and planning of care technologies, directed to the motivation of behavior in adhering to health promotion and protection measures.

In this context, it was defined as behavior of interest for the study the reduction of salt intake in the diet in the next 30 days, which includes the target elements, action, context and time, according to the theoretical assumptions adopted, to understand the positive and negative aspects, facilities and difficulties to achieve them, contributing to favorable advances in the clinical outcomes of this population.

Given the above, the objective of this study was to analyze the behavioral, normative and control beliefs related to the reduction of salt intake in the diet of people with HF.

## THEORETICAL REFERENCE

According to the TPB, in order to predict behavioral intention, based on the concepts of attitude, subjective norm and perceived behavioral control, it is essential to elucidate salient beliefs regarding the phenomenon of interest. Salient beliefs are the most frequent, that is, more often mentioned and originated from a common universe and subject, when the individual is approached through open questions about the studied behavior<sup>8</sup>.

In this context, the first antecedent, attitude, is composed of behavioral beliefs, which are related to the subject's favorability regarding the performance or not of the behavior and the evaluations of the positive or negative consequences for the execution of the behavior in question<sup>8</sup>.

The second antecedent, the subjective norm, refers to the social influence, that is, the perceived social pressure, constituted by the normative beliefs that reflect the individual's perception about the opinions of their social referents about the performance or not of the behavior, as well as on individual motivation to agree with social referents<sup>8</sup>.

The third antecedent, perceived behavioral control, consists of control beliefs; it consists of the individual's perceptions of the ability to perform the behavior or not, as well as the presence of factors that may facilitate or hinder its performance. These factors include internal (information, personal disabilities, skills, emotions) and external (opportunities, dependence on others, barriers) control<sup>8</sup>.

## METHODOLOGY

This is a descriptive study with a quantitative and qualitative approach, developed in two public health institutions in the city of João Pessoa/PB, from January to February 2018.

Following the precepts of the adopted theoretical framework, there is no requirement as to the number of subjects to elucidate the salient beliefs about a behavior of interest. However, depending on the data saturation criterion recommended by the TPB<sup>8,10</sup> for the survey of beliefs, in which new information was no longer obtained, in this study, the saturation of the information was achieved in statements of 26 respondents.

Thus, the sample consisted of 26 participants. A non-probabilistic sample was used for convenience, and the following inclusion criteria were used for sample selection: people with a diagnosis of HF, aged  $\geq 18$  years old, of both genders, regardless of etiology, categorized into functional classes I-III of the *New York Heart Association* (NYHA)<sup>3</sup>, have a record of the left ventricular ejection fraction assessed by transthoracic echocardiography in the last six months and

in outpatient follow-up. People at first consultation were excluded because they may not yet be adequately aware of non-pharmacological management measures for clinical control of HF and had verbal cognitive impairment reported in the medical record.

Data collection occurred through an individual audio-recorded interview, conducted after participants were informed about the study and obtained their written consent (Free and Informed Consent Form), guided by two instruments. The first instrument was a questionnaire containing sociodemographic and clinical questions to characterize the participants. The second instrument, a structured form with six open-ended questions, in order to raise behavioral, normative, and control beliefs about reducing dietary salt intake over the next 30 days. Such an instrument was built in line with the theoretical assumptions of TPB<sup>8,10</sup> which content had been evaluated by three researchers in the Chronic Disease Study and Research Group of the Federal University of Paraíba. Then, a pilot test was conducted with 10 people with HF, which showed the adequacy of the instruments used in the data collection technique for the target population, allowing the continuity of the study.

For the investigation of positive and negative behavioral beliefs, the questions were the following: What do you think are the advantages of reducing your dietary salt intake over the next 30 days? What do you think are the disadvantages of reducing your dietary salt intake? For normative, positive and negative beliefs: Which important people do you think should reduce your dietary salt intake? Which important people do you think should not reduce your dietary salt intake? And to assess the control beliefs: What factors make it easier for you to reduce your dietary salt intake over the next 30 days? What factors make it difficult for you to reduce your dietary salt intake over the next 30 days?

Regarding data analysis, descriptive statistics was applied. For continuous variables, mean and standard deviation were calculated. The categorical variables were analyzed by calculating the absolute and percentage frequencies. The beliefs related to the reduction of salt intake in the diet were submitted to content analysis, according to the recommendations proposed by TPB. First, the participants' speech transcripts were read, followed by the selection of answers for categorization, by the criterion of similarity and by counting the frequency of their emission. It was adopted as a criterion that the salient modal beliefs should represent an index  $\geq 75\%$  of the total of the emitted answers.<sup>8,10</sup> From this criterion, beliefs with three or more emissions made up the modal game. The constructs determined by the TPB, behavioral beliefs, normative beliefs and control beliefs were used to group responses<sup>8,10</sup>.

The study was approved by the Research Ethics Committee under Opinion No. 2,406,616/2017 and CAEE: 79911717.0.0000.5183.

## RESULTS

The sample consisted of 26 people with HF, with a mean age of  $61.27 \pm 11.80$ , ranging from 35 to 82 years old. Among the participants, 14 (53.8%) were male, 15 (57.7%) declared themselves non-white, 16 (61.5%) lived married or in a stable union. The mean schooling level corresponded to 4.81 years of study, 25 (92.2%) were economically inactive and 23 (88.5%) had a family income between one and two minimum wages.

Regarding the clinical characteristics, it was found that the majority, 15 (57.7%), were in functional class II, according to the NYHA criteria. Regarding the etiology of the HF, 18 (69.2%) had non-ischemic cardiomyopathy. Concerning HF-associated comorbidities, 13 (35.1%) had systemic arterial hypertension and 9 (24.3%), cardiac arrhythmias. The mean left ventricular ejection fraction was  $43.35 \pm 13.77$ , ranging from 20 to 69%. Diuretics and beta-blockers were the main drugs used, mentioned by 21 (38.2%) and 19 (34.5%) of the participants, respectively.

Regarding the analysis of behavioral beliefs, regarding the advantages and disadvantages of reducing salt intake in the diet, there is a greater frequency for health maintenance and decreased appetite, respectively, as shown in Table 1.

Regarding the normative beliefs, that is, people who are important to those investigated with HF and consider that they should reduce salt intake in the diet, spouses stood out as positive social referents, according to Table 2.

Concerning the negative referents, of the 26 research participants, 21 (80.7%) reported that there were no people who thought it was important not to reduce their dietary salt intake in the next 30 days. Two occurrences were observed for family members, one issue for husband, brother, and the participant himself. Considering the criterion adopted for the study to include as salient beliefs those issued by at least three respondents, we identified the absence of negative referents.

**TABLE 1:** Frequency of positive and negative behavioral beliefs about reducing dietary salt intake. João Pessoa, PB, Brazil, 2018.

Advantages	Behavioral beliefs		f (%)
	f (%)	Disadvantages	
Maintains health	22 (81.4)	Decreases appetite	8 (40.0)
Prevents worsening of symptoms	4(14.8)	Change in food flavor	7 (35.0)
Idiosyncratic	1 (3.8)	Habit of using salt	3 (15.0)
		Family complaint	1 (5.0)
		Cook separately	1 (5.0)
Total	27 (100.0)		20 (100.0)
CCMS(*)	26 (96.2)		18 (90.0)

(\*) Salient modal behavioral beliefs.

**TABLE 2:** Frequency of positive normative/referential beliefs about reducing dietary salt intake. João Pessoa, PB, Brazil, 2018.

Positive referents	f (%)
Spouse	15 (48.5)
Children	9 (29.0)
Siblings	3 (9.6)
Family	2 (6.5)
Neighbors	1 (3.2)
Nephews	1 (3.2)
Total	31 (100.0)
SMNB(*)	27 (87.1)

(\*) Salient modal normative beliefs

As for the control beliefs, which evaluate the ease and barriers to the execution of behavior, the preparation of meals by the wife facilitates and the loss of food flavor makes it difficult, according to Table 3.

**TABLE 3:** Frequency of positive and negative control beliefs about reducing consumption of salt in the diet - João Pessoa, PB, Brazil, 2018.

Practicalities	Control beliefs		n (%)
	n (%)	Difficulties	
Preparation of meals by wife	8 (42.1)	Loss of food flavor	10 (62.5)
Meal preparation separately	4 (21.0)	Lack of control in choosing food for meal preparation	4 (25.0)
Family helps remembering	4 (21.0)	Family enjoys using salt	2 (12.5)
Enjoy low salt food	1 (5.3)		
Replace salt with herbs and spices	1 (5.3)		
Idiosyncratic	1 (5.3)		
Total	19 (100)		16 (100)
CCMS(*)	16 (84.1)		14 (87.5)

(\*) Salient modal control beliefs

## DISCUSSION

Regarding the analysis of the behavioral beliefs, according to the TPB, it can be stated that, through the beliefs, a person ponders the consequences of a future action, in a dimension of favorability or unfavorability. Advantages of

*maintaining health and preventing the worsening of the HF symptoms* were identified. Thus, although the findings are consistent, there is limited perception of the health benefits of reducing the consumption of high salt foods, as only 14.8% of the participants associated the benefits with the control of the HF symptomatology.

This fact may be related to the lack of knowledge, purpose and effects of reduced salt intake on the pathophysiology of the disease. Excessive sodium intake is known to cause fluid retention and accumulation, triggering changes in extracellular volume control that produce de-compensation and prompt immediate medical care<sup>11</sup>.

In agreement with these findings, a national survey that analyzed the knowledge of people with HF about the disease identified that it is based on individual experiences, without scientific basis, but through the common perception apprehended in the daily management of HF<sup>12</sup>. Thus, it is essential that educational strategies outlined by the multidisciplinary team are tested and implemented in the care offered to this population, in order to clarify the health/disease process, favoring a broader view of self-care management and quality of life.

Among the negative behavioral beliefs, *decreased appetite, change in food flavor and salt habit* presented themselves as salient. It is noted that the changes in the palatability of foods associated with the eating habits of salt in the preparation of meals are negative aspects for reducing dietary salt intake.

Thus, there is consistency with the beliefs about the disadvantages of reducing salt consumption. These findings lead to reflections of cultural context regarding the local cuisine, which is strongly influenced by the preference of foods rich in sodium. In addition, the use of industrialized condiments in the preparation and cooking of foods, as well as the use of table salt to accentuate the taste of meals, bring the feeling of pleasure and well-being<sup>13</sup>. The practice of these actions needs to be reevaluated for the necessary lifestyle change, in order to favor the maintenance of the clinical stability of HF.

In people with HF, activation of the renin-angiotensin aldosterone system induces neuroendocrine stimuli to taste changes due to the low concentration of sodium in the body, favoring the perception of a satisfactory and pleasant taste when eating high salt diets<sup>13</sup>. In line with this statement, a prospective cohort study, which analyzed the perceived palatability of foods with different salt concentrations in clinically compensated HF patients showed significantly greater preference for high salt meals when compared to healthy subjects ( $p < 0.001$ )<sup>14</sup>.

Therefore, the results found open perspectives for the development of care technologies, aiming at reversing negative beliefs into positive ones, in order to strengthen adherence to health protective measures. Thus, persuasive audiovisual communications based on the beliefs of people with CI on the subject, can be tested as an intervention strategy at the individual and/or collective level to influence changes in beliefs, attitudes, and behavior toward reduced salt intake. Media communications to reduce salt intake are strategies recommended by the World Health Organization to promote, control and maintain clinical stability of clients with chronic cardiovascular disease to be achieved by 2025<sup>15</sup>.

Regarding the normative beliefs, the salient modal positive social referents were *spouses, children, and siblings*. From the results found, it can be observed that people of close daily life are the most important referents that can influence the motivation to achieve the expected behavior. Therefore, it is understood that family support can help to increase the dietary changes necessary for the clinical management of HF.

It is to be noted that, in the process of coping with a chronic disease like HF, the construction of social support networks contributes to the success of the instituted therapy. Incorporating new eating habits requires encouragement and understanding of the social core in which you live<sup>16,17</sup>. It is assumed that shared experiences favor a better understanding and development of skills that promote self-care practice and, consequently, the quality of life. Therefore, it is appropriate to reflect on the structuring of support networks with the integration of family members, neighbors, friends, who can share feelings and experiences in living, caring for and empowering the self-care of people with HF regarding the follow-up of prescribed therapy. and especially in reducing dietary salt intake.

It is to be noted that, among the normative beliefs, no negative social referents emerged. In this sense, it is considered that the important people for the interviewees supported the reduction of salt consumption. Thus, the important family participation in the motivation of people with HF to consume a low salt diet is reasserted, contributing to minimize deleterious advances to the myocardium and possible undesirable hospitalizations.

In the sample investigated, the health professionals were not mentioned as positive or negative referents, as it is worrying, suggesting weaknesses in their bond with the service users, since these professionals are considered

promoters in promoting the reduction of salt consumption in the population, a goal defined by the World Health Organization and assumed by Brazil in the confrontation plan for control of noncommunicable diseases<sup>18</sup>.

Thus, it is suggested that professionals invest in self-care strategies to strengthen the bond with users in the various health care settings, in order to become positive referents with potential to favor knowledge about health conditions, as well as support needed to solve problems, contributing to better therapeutic management<sup>19</sup>.

Regarding the control beliefs, it is evident that *meal preparation by the wife, preparing meals separately and family help to remember* are salient beliefs concerning the facilities for reducing salt consumption. However, there is a relationship of dependence between the participants and their social referents regarding the range of expected behavior.

These findings refer to reflections of historical and social context when determining that the wife is responsible for the administration and maintenance of domestic activities, including the preparation of food. Over the last few decades, although male co-participation has increased in the dynamics of household chores, it is important that strategies are implemented for those responsible for meal preparation, in order to clarify aspects of diet therapy in people with HF and the importance of reduction of salt intake not only to control these cases, but also to the cardiovascular health of the family.

An international multi-center study aimed at examining family adherence to a low sodium diet and its effect on adherence of people with HF found that living with a spouse or other family member improved patient compliance with a diet. low sodium. The authors show that patients whose family members followed the recommended diet had lower urinary sodium excretion ( $p=0.003$ ) and were 1.6 times more susceptible to low sodium dietary adherence ( $p=0.035$ )<sup>20</sup>.

Thus, the role of the family as an adjunct in adhering to the non-pharmacological management measures recommended for the clinical stability of HF clients is reinforced. It is suggested that actions with nutritional approach be developed for the whole family arrangement, considering socioeconomic and clinical conditions, in order to identify skills and potentialities for the execution of a diet with less salt and higher intake of healthy food.

As for the control beliefs, *loss of flavor and lack of control in meal preparation* were salient. Several studies indicate that comorbidities associated with HF, vitamin deficiency, harmful health risk factors, like smoking, and diuretic therapy used in the pharmacological management of the disease may alter the perception of palatability of food in the face of electrolyte deficit, which may influence the loss of food flavor and the rejection of a low salt diet<sup>13,21</sup>.

In addition, the restricted food variety makes it difficult to control food in meal preparation, especially for patients who eat away from home<sup>7,22</sup>. The presence of processed, ultra-processed foods and the significant increase in *fast-food* chains are aspects that facilitate the access and purchase of high salt meals.

Given these findings, it is considered pertinent to implement educational interventions that seek to broaden the knowledge and understanding of this population about maintaining the taste and preparation of food. It is suggested to replace industrialized high-sodium seasonings for their conservation by the use of herbs, natural seasonings and spices, in order to contribute to enhance the palatability of the food, providing a feeling of well-being and pleasure for its consumption.

As a limitation of the study, the lack of answers to the understanding of the investigated phenomenon can be pointed out. Therefore, new research studies conducted in different regions of the country, in view of cultural plurality and eating habits, are necessary to ratify, expand or refute the findings illustrated in this research, as this is a human behavior subject to the influences of the sociocultural environment. that people live and it is not possible to generalize the findings.

For the nursing practice, this study raises reflections on the need to further emphasize the importance of reducing salt intake in educational actions directed to people with cardiovascular disease. The results obtained will support the development of persuasive care technologies, with the aim of strengthening positive beliefs and reversing negative beliefs. Moreover, they will support the construction of a psychometric scale to measure the determinants of dietary salt intake reduction behavior.

## CONCLUSION

The results found in this investigation revealed the behavioral, normative and control beliefs of people with HF that should be strengthened and mitigated in view of the reduction in dietary salt intake, which has advantages for maintaining health and preventing the worsening of HF symptoms. It is noted that family members exert a strong influence on the reduction of salt intake, as well as stand out as facilitating members to achieve the expected behavior. Similarly, it was identified that changes in food palatability constitute disadvantages and barriers to adherence to a low salt diet.

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