

ORIGINAL RESEARCH

# Self-Care Behaviors in Patients with Hypertension to Prevent Hypertensive Emergencies: a Qualitative Study Based on the Theory of Planned Behavior

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## ABSTRACT

**Background:** Hypertension is a crucial general health issue. Severe and acute hypertension needs urgent medical intervention. Self-care behaviors can help patients with hypertension in controlling blood pressure and preventing hypertensive emergencies. This study aimed to determine the perception of hypertension towards self-care behaviors using constructs of the theory of planned behavior (TPB) in critically ill patients with hypertension to prevent hypertensive emergencies. **Material and Methods:** This study was conducted based on the directed qualitative content analysis of 33 critically ill patients with hypertension who participated in semi-structured interviews and focus group discussions. Results: The data were analyzed based on the four main categories of TPB. The attitude category consisted of positive and negative subcategories. The subjective norms category consisted of authority of healthcare staff, family support and approval, and influence of friends subcategories. The perceived behavioral control category included discipline, self-control, receiving consultation, individual concerns, financial problems, access to medicine, food culture, and coronavirus limitations subcategories. The behavioral intention category had intention to perform the behavior and intention to continue a behavior subcategories. **Conclusion:** The results revealed the requirement for a multidimensional approach to improve attitude, subjective norms, and behavioral control for performing self-care behaviors to reduce the number of hypertensive emergencies in critically ill patients with hypertension. Factors affecting self-care included socioeconomic status, family support, governmental organizations, and participants' health condition.

**Keywords:** self-care behaviors, directed content analysis, severe hypertension, theory of planned behavior, acute hypertension

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## INTRODUCTION

Hypertension significantly increases the risk of cardiovascular, cerebrovascular, and renal diseases, and severe acute hypertension needs urgent medical intervention. About 1.28 billion adults aged 30 to 79 years have hypertension worldwide, most of whom live in low- and middle-income countries.<sup>1</sup> A national survey for noncommunicable disease risk factors in 2016 showed that around 30% of the Iranian population older than 30 years suffers from hypertension.<sup>2</sup> In Iran, the prevalence of hypertension varies between 17% to 25% among adults and is more prevalent among men.<sup>3</sup> The factors causing the high prevalence of hypertension include population growth, aging, and unhealthy behaviors including improper nutrition, alcohol consumption, lack of physical activity, overweight, and stress.<sup>4</sup>

Self-care is of great importance to improve hypertension control.<sup>5,6</sup> Uncontrolled hypertension leads to myocardial infarction, stroke, or other complications.<sup>7</sup> Self-care measures that can be used to control hypertension include weight loss, cessation of smoking, eating low-salt and low-fat foods, and physical activity.<sup>8</sup> Self-care behaviors lead to 4.3 mmHg and 5 mmHg reduction in systolic and diastolic blood pressure, respectively, and prevent hypertensive emergencies.<sup>6,9</sup> Self-care behaviors help patients to be independent, save costs, alleviate the effects of illness and disability, and shorten the hospitalization period. Therefore, self-care can be one of the most effective strategies to prevent and control both chronic and acute hypertension.<sup>10</sup>

There are many ways to help treat patients with hypertension, including social support, high-level awareness, frequent measurement of blood pressure, and stress-coping strategies.<sup>11–13</sup> However, few studies have introduced effective factors based on the patients' experiences and points of view. Studies that use a quantitative approach are not based on the individuals' experiences and perceptions because these are interconnected with the cultural context of the community they live in. Hence, it is useful to carry out qualitative studies to examine patients' experiences related to their self-care behaviors. Better perception can be a significant and effective step to improve disease outcomes and quality of life. Behavior-related theories discuss why individuals are involved in a specific behavior or fail to do it.<sup>14</sup> Behavioral theories and models can be used to explain factors affecting self-care.<sup>15</sup> The theory of planned behavior (TPB) states that behavioral outcomes depend on both intention and behavioral control. TPB is a reliable psychological theory of decision-making, which

suggests that there are three constructs predicting an individual's intention to engage in a specific behavior: attitude, subjective norms, and behavioral control. According to the TPB, the combination of these three constructs can result in an intention, which subsequently leads to the behavioral outcome. TPB provides a more generic view of behavioral change, suggesting that knowledge improvement alone cannot create any change in behavior.<sup>16</sup> TPB has been widely used in health studies to predict and explain various health-related behaviors.<sup>17–20</sup>

Given the high prevalence of hypertension in Khamir city<sup>21</sup> and the importance of patients' perception, the objective of the present qualitative study was to explain patients' self-care behaviors in controlling hypertension and preventing hypertensive emergencies in Khamir city of Hormozgan, Iran.

## METHODS

This study was based on a directed qualitative content analysis. In this approach, the initial coding originates from a theory, which can contribute to forecast variables or relationships between variables.

## PARTICIPANTS AND RECRUITMENT

The study included 33 critically ill patients with hypertension supported by public health centers in Khamir city. Participants were selected to ensure maximum diversity in terms of gender, occupation, age, marital status, and education level, from different geographical areas of Khamir city.

## INCLUSION AND EXCLUSION CRITERIA

Inclusion criteria were a minimum interval of 6 months from hypertension diagnosis, age above 30 years, willingness to participate in the study, and ability to fill out the informed consent. Exclusion criteria were suffering from severe side effects caused by hypertension during the study.

## DATA COLLECTION

The study involved 24 individual interviews and one focus group discussion with 9 participants. Every interview was done through a semi-structured method, using a framework designed for the interview. Interviews took 70–100 minutes, while the focus group discussion took 4 hours. Interviews were recorded with a voice recorder after obtaining permission from the participants. The interviews

were conducted in a quiet location such as a consultation or prayer room in the public health center. The focus group discussion was conducted with the presence of a researcher and a note taker. Thus, while conducting the interviews, the non-verbal behaviors of the patients, such as facial changes and eye contact, were paid attention to and recorded in the notes. Data collection continued until saturation occurred. Data analysis was done simultaneously with their collection through the theory-based content analysis method.

### TPB CONSTRUCTS

Information collected during the interviews was divided into four main categories: attitude, subjective norms, perceived behavioral control, and behavioral intention. Attitude indicates the personal evaluation of behavior.<sup>15</sup> Subjective norms are related to a person's belief about whether individuals who are important to them accept or reject their behaviors.<sup>15</sup> According to the TPB, individuals shape their objectives based on the opinion of their family, friends, or any trusted person.<sup>15</sup> If the person is supported by individuals who are important to them, they will be motivated to start and maintain self-care behaviors. Perceived behavioral control implies the belief that a person has control over their behavior and can do it.<sup>15</sup> The belief in the ability to carry out an important measure is an important factor affecting their decisions about displaying self-care behaviors. Behavioral intention is the perceived likelihood of performing the behavior.<sup>15</sup>

In total, 15 subcategories were derived from data analysis. Attitude comprised two subcategories, positive and negative. Subjective norms consisted of three subcategories: the authority of healthcare staff, family support and approval, and the influence of friends. Perceived behavioral control consisted of eight subcategories: discipline, self-control, receiving consultation, individual concerns, financial problems, access to medicine, food culture, and coronavirus limitations. Behavioral intention included two subcategories: intention to perform the behavior and intention to continue the behavior.

### INTERVIEW GUIDE

An interview guide was designed to conduct the interview. The guide was divided into two sections. The first section included questions related to the participants' demographic information including age, disease duration, education level, marital status etc. The second section comprised questions based on the TPB constructs. The participants

were asked about the factors that influence their decisions to engage in self-care behaviors. The questions were flexible, meaning that the researcher asked any question required to help participants understand the subject better. The general question of the interview was "How do you control your disease status and health?". The following, more specific questions were related to different TPB constructs. Attitude: "What do self-care behaviors mean in your opinion?", "How can you have healthy self-care behaviors?" Subjective norms: "How does the opinion of family members (parents, spouse) or other important persons influence your self-care behaviors?" Perceived behavioral control: "What problems do you encounter when doing self-care behaviors?", "Can you talk about your potential to remove these barriers?" Behavioral intention: "Do you have any plan for self-care behaviors in the coming months?", "How do you intend to design these plans?".

### ETHICAL CONSIDERATIONS

This study was approved by the ethics committee of the Hormozgan University of Medical Sciences (IR.HUMS.REC.1399.214). In the first phase of the interview, the authors explained the research objective and interview method, ensured participants about the confidentiality of their data, and explained that they are free to leave the study at any time. Informed consent was obtained from all participants.

### DATA ANALYSIS

The present study used directed content analysis and simultaneous data collection. Accordingly, the researcher listened to the recorded information after the end of each interview session. All recordings were transcribed word by word, and the transcribed text was read several times to achieve a profound and accurate understanding of the data. The text was divided into the smallest meaningful units (code). After extracting the initial codes, items with similar concepts and meaning were classified into one category. Finally, the items were placed in the predetermined categories of TPB constructs. The next interview was planned after the precise analysis of the transcriptions. The data were analyzed using MAXQDA version 10 (VERBI Software, Berlin, Germany).

### RIGOR OF THE DATA

Lincoln and Guba's method was used to examine data reliability.<sup>22</sup> Accordingly, credibility, dependability, confirm-

ability, and transferability were ensured to achieve data accuracy and rigor. Credibility was established by allowing sufficient time for data collection and keeping long-term involvement through frequent data assessment. Data rigor was also ensured by the maximum diversity of the samples. Dependability was ensured through the revision process by colleagues and research team members. Confirmability was established by refraining from prejudgment in data collecting and analysis procedures. Transferability was established by mentioning all phases and conditions of the study (data collection process, time and place of collection etc.) and an accurate and step-by-step description of the research.

## RESULTS

In this research, 90.9% of the participants were married, and 30.3% of them had elementary education. Regarding

occupation, 48.48% of the participants were housewives. The mean age of the participants was 51.34 years (range: 31–72 years). The mean age of disease onset was 43 years. All patients were receiving antihypertensive treatment at the time of the study (Table 1).

## ATTITUDE

The participants had different positive and negative views about self-care behaviors and their consequences.

### A. Positive attitude

Most patients had a positive attitude toward self-care behaviors because it could improve hypertension and lead to beneficial effects on their physical health. In some cases, those with self-care behaviors believed that these behaviors require a good sense of health. Healthcare behaviors were perceived as a solution to prevent disease.

*“If I protect myself, it will positively affect my lifetime, health, and happiness. It is important to exercise and avoid fast foods and junk foods that have poor-quality ingredients.” (A 54-year-old woman with an associate degree)*

*“Self-care behaviors allow remaining fit and healthy. It is also good for our minds.” (A 40-year-old woman with high-school education)*

### B. Negative attitude

Some participants had inaccurate beliefs about self-care behaviors, and therefore they stopped doing them. They expressed a range of negative beliefs including the negative effects of weight loss, the usefulness of smoking, and more consumption of animal fats to treat disease.

*“If I quit hookah, it will not be beneficial for my blood pressure. In my opinion, it is useful for hypertension.” (A 48-year-old illiterate woman)*

## SUBJECTIVE NORMS

Most participants felt that advice and encouragement from family members (spouse, children, and parents), health personnel, relatives, friends, and other key individuals, such as nutrition consultants, encourage them to exhibit self-care behaviors. Some patients explained that emotional support from family and companions effectively increased their self-confidence, improved their health, and helped them obtain peace. In this study, these factors were extracted in the form of three sub-categories:

**TABLE 1.** Demographic characteristics of the participants (N = 33)

Variable	N (%)
Age group	
30–50 years	19 (57.57)
51–72 years	14 (42.42)
Gender	
Female	22 (66.66)
Male	11 (33.33)
Marital status	
Single	1 (3.03)
Married	30 (90.9)
Divorced	1 (3.03)
Widowed	1 (3.03)
Employment status	
Employed	12 (36.36)
Retired	5 (15.15)
Housewife	16 (48.48)
Education	
Illiterate	8 (24.24)
Primary School	10 (30.3)
Intermediate	2 (6.06)
Diploma	5 (15.15)
Associate degree	3 (9.09)
Bachelor's degree	4 (12.12)
Master's degree	1 (3.03)
Disease duration	
Less than 2 years	8 (24.24)
2–5 years	4 (12.12)
5–10 years	11 (33.33)
More than 10 years	10 (30.3)

### A. Authority of healthcare staff

Patients cared about the opinions of the medical team when deciding about hypertension treatment. Good doctor–patient communication and patient satisfaction lead to better medication adherence. Healthcare providers promote greater patient satisfaction, reduce non-adherence risks, and improve the patients' involvement. Healthcare professionals should ask about patients' opinions and concerns, listen to them, and use a joint care decision-making model.

*“A physician can play a vital role. The medical staff has authority, and we should receive their advice on self-care behaviors. In my opinion, receiving a consultation from a professional physician and specialist is better than a non-professional person. When a health expert talks about diet, it is more reliable than others.”* (A 54-year-old man with an associate degree)

### B. Family support and approval

Many participants considered the opinions of family members highly valuable. The results indicated that family could help patients adhere to self-care behaviors and obtain good behavioral outcomes. Family members with effective relationships can be more successful when helping and supporting their patients. This support is provided as emotional and mental help and financial support by family members during the disease. Most participants explained that the emotional presence and support of parents, family members, spouses, and others during challenging conditions after diagnosis helped them accept and cope with the illness.

*“It has been a while since I did not take my medications regularly. When I was at home, my mother asked me to take my medications as soon as possible. My mother always encourages me to take my drugs regularly and timely.”* (A 34-year-old woman with a bachelor's degree)

*“My spouse and children always take care of me, and I obey their orders. My wife supports me and does not add too much salt to the food. She makes low-fat foods. She takes care of me and asks me to exercise and walk. She even measures my blood pressure at home.”* (A 47-year-old man with a bachelor's degree)

Moreover, some participants were willing to satisfy their families, especially their spouses.

*“I love fast food, but my husband does not allow me to eat because I am sick. I want to satisfy my husband, so we never buy fast food.”* (A 34-year-old woman with a bachelor's degree)

### C. Influence of friends

Some participants valued their friends' opinions, who called and encouraged them to perform self-care behaviors.

*“When I see my friends who follow a healthy diet and have a fit body, then I am stimulated to do so. On the contrary, I have some friend who encourages me to use hookah when we are out.”* (A 54-year-old man with an associate degree)

## PERCEIVED BEHAVIORAL CONTROL

Patients who decided to take care of themselves needed to control their situation by performing self-care behaviors. They wished to do anything they could to alleviate the consequences of their disease. They considered self-care behaviors the only effective option to reduce the risk. Some patients assume it is difficult to exhibit self-care behaviors and that they are ineffective in preventing disease consequences. The following eight subcategories explain the concept of perceived behavioral control.

### A. Discipline

Most patients confirmed the positive impact of planning self-care behaviors.

*“I plan to perform self-care behaviors, particularly exercise. The reason is that I am an employee and without planning or discipline, I cannot do it regularly.”* (A 42-year-old woman with a bachelor's degree)

Most patients stated that they put medications in plain sight, in their pocket, bag, car, or beside a glass of water or toothbrush to take them regularly.

*“I put my medications somewhere that I can see them. I think it is not hard to take my medication in the morning when I am going to work. It is like when I feed my rabbit and do not forget it.”* (A 40-year-old woman with bachelor's degree)

### B. Self-control

The willpower that participants talk about is not constant, and internal and external motivations will appear after a while. The participants explained that they could do their daily exercise regularly by ensuring certain conditions such as enrolling in a club, assigning a time for exercise, and considering a place for it.

*“I do exercise under any circumstance. I go to a club to lose weight and buy a treadmill to do exercise at home when I am not in the club.”* (A 34-year-old woman with a bachelor's degree)

Patients mentioned that if they have strong willpower, they can control themselves in tempting situations. But if they have weak willpower, they are not able to quit smoking. After developing strong willpower, participants made attempts to quit, meaning they reduced the number of cigarettes and smoked occasionally. We found that smok-



ers can break the cycle of smoking with strong willpower to quit.

*“It was difficult for me when I decided to quit smoking, but I did it. I tried to keep myself busy and do other work. I replaced smoking with chewing gum and apples.” (A 71-year-old illiterate man)*

### **C. Receiving consultation**

Most participants explained that increasing the awareness of patients and families increases their ability and efficacy to perform self-care behaviors. Patients referred to public health centers felt they could obtain calmness by relying on their ability to decide about their health and welfare, perform regular self-care behavior, and contact specialists if there were any symptoms or changes in their condition. Participants should understand the importance of blood pressure and the consumption of medications regularly. In addition, they must learn how to cope with lost doses and recognize side effects.

*“I go to the health center to receive treatment and consultation, and the physician or staff offer consultation and teach me about medicine and diet. They measure my blood pressure and answer my questions, which is great!” (A 50-year-old woman with an elementary school education)*

### **D. Individual concerns**

The patients mentioned several barriers to self-care behaviors such as occupation, forgetfulness, and time limitations due to children's homework, caring for children, administrative tasks, job limitations, daily activities, and family conflicts.

*“I have three children that go to school, and I have to take care of them. I make food, clean the house, and wash clothes, so I forget to take my medicines.” (A 43-year-old woman with a diploma degree)*

### **E. Financial problems**

Some participants mentioned economic problems as one of the most important factors affecting their self-care behaviors. Economic problems prevent patients from following their diet or taking their medications. Moreover, some of the participants suffered from other diseases as well and had extra costs, and the study population was selected from a deprived province of Iran, where people have more financial problems.

*“Food is expensive, and we cannot follow healthy diets. My family has a low income and cannot buy anything we want. We*

*eat everything that is available, while a patient must have a good diet with fruits, meat, and fish.” (A 43-year-old woman with elementary school education)*

### **F. Access to medicine**

Access to medicine is one of the main factors related to medication adherence. It is important to facilitate patients' access to medicine to improve medication adherence in patients with hypertension. According to the obtained information, the distance between home and drugstore or medical centers (i.e., geographical access) indicates the importance of this construct. On the other hand, certain medications may not be available in certain centers or drugstores. The lack of insurance coverage or insufficient support is another factor causing problems to patients. In general, factors related to the patient and health system are two main factors in this context.

*“It takes one hour from my house to reach the drugstore. Hypertension medicine is sold without any insurance coverage. Health insurance does not cover the cost of hypertension medications. Hence, I cannot take my medications regularly.” (A 43-year-old man with elementary school education)*

### **G. Food culture**

Most patients pointed to the importance of the common food culture of society as an obstacle to hypertension control. Salty fish is a traditional food in this city, and food habits are passed on from generation to generation.

*“I usually eat traditional bread impregnated with oil.” (A 42-year-old woman with a bachelor's degree)*

### **H. Coronavirus limitations**

The participants did not perform self-care behaviors due to the COVID-19 pandemic. In general, the COVID-19 pandemic affected both hypertension self-care behaviors and relevant clinical care. Hypertension is a risk factor for severe respiratory infection and viral infections. Diabetes, chronic respiratory and kidney diseases, hypertension, and cancer are the most vulnerable diseases causing death in the presence of COVID-19. Many people do not have access to medications, healthcare, fresh food, and physical activity. Physical activities are the most important self-care behaviors associated with hypertension, which unfortunately have been affected by home quarantine. Some participants explained that their physical activities were reduced during the COVID-19 pandemic and lockdown, and they were unable to do sports activities due to gym closures.

*“I had enough physical activity before the COVID-19 pandemic. I walked every day for a year. I used to go to women’s parks and exercise, but the COVID-19 pandemic interrupted my physical activity.” (A 42-year-old woman with a bachelor’s degree)*

Some participants did not go to healthcare centers due to fear of coronavirus infection. Some participants explained that they did not follow their check-ups since the beginning of the COVID-19 pandemic. Social distancing and home quarantine negatively affected access to clinical care and self-care behaviors of hypertension patients.

*“I did not visit the physician or health center to measure my blood pressure during the COVID-19 pandemic. I was afraid of being infected by the coronavirus. I had to measure my blood pressure at home, which was unreliable. I also take my medications without a physician’s prescription.” (A 46-year-old woman with secondary school education)*

## BEHAVIORAL INTENTION

Most patients reported that they made their final decision on performing self-care behaviors after considering the opinions of healthcare providers.

### A. Intention to perform the behavior

The patients with positive experiences from self-care behaviors were encouraged to display such behaviors.

*“I want to buy a bicycle because exercise helps me to have a high-quality sleep, calmness, happiness, and pleasure.” (A 40-year-old man with an elementary school education)*

Individuals intend to change their behaviors only when they suffer from hypertension.

*“I tend to not feel good only when my blood pressure rises and when I have a headache. In this case, I reduce smoking for a limit period” (A 43-year-old man with an elementary school education)*

### B. Intention to continue the behavior

Some participants who engaged in self-care behaviors tended to continue them in the future.

*“I want to quit eating salty foods because my blood pressure goes up. It will be perfect if I can eat foods with less salt.” (A 61-year-old man with an elementary school education)*

Some patients tried to perform self-care behaviors despite limitations.

*“I try to start again and plan for doing more physical activities despite occupational and coronavirus-related limitations.” (A 40-year-old man with a master’s degree)*

## DISCUSSION

The present study examined the perception of critically ill patients with hypertension about self-care behaviors and factors affecting this perception using the theory of planned behavior. We chose this patient population because of the high global prevalence of hypertension and the fact that uncontrolled hypertension can lead to myocardial infarction, stroke, or other complications.<sup>7</sup> The data collected from study participants was divided into four main categories comprising 15 subcategories: 1) attitude (positive and negative); 2) subjective norms (authority of healthcare staff, family support and approval, and influence of friends); 3) perceived behavioral control (discipline, self-control, receiving consultation, individual concerns, financial problems, access to medicine, food culture, and coronavirus limitations); 4) behavioral intention (intention to perform the behavior and intention to continue behavior).

The participants had different attitudes toward self-care, influenced by various factors. A positive attitude (i.e., one that associates self-care with improvement of physical health and being happy) contributes to the improvement of self-care behaviors in patients with hypertension. According to a study by Emonena *et al.*, positive attitudes towards blood sugar control could reduce HbA1C among patients with type 2 diabetes.<sup>23</sup> On the contrary, a negative attitude towards self-care behaviors leads to patients’ lack of selection or quitting self-care. Sometimes it is impossible to change the patients’ decisions due to illiteracy, age, and ignoring recommendations. Shima *et al.* concluded that the patients’ attitude, rather than the issue of health service availability, was the main reason for treatment non-adherence in hypertension.<sup>24</sup> These results suggest that an individual’s attitudes towards a certain behavior is shaped by their beliefs. The inclusion of these concepts in the educational curriculum would save time and increase the effectiveness of treatment.

The family and relatives of patients with hypertension play a vital role in implementing educational methods and self-care behaviors to prevent and control the effects of the disease. Our study also found that healthcare specialists influence the participants’ decisions about self-care behaviors. The physician’s communication style influences the level of knowledge and beliefs of the patient about medication, attendance, and satisfaction with treatment.<sup>25</sup> It has been suggested that a participatory style and joint decision-making establishes a participatory relationship in which the physician enables the patient to play an active role in their treatment.<sup>26</sup> Fort *et al.* considered the

“vertical style of communication” of physicians as a barrier to effective self-management among patients with diabetes and hypertension in Mexico and Costa Rica.<sup>27</sup> In a qualitative study performed by Mathew *et al.* in Toronto, Canada, elderly patients with diabetes expressed a need to receive support from their physicians in both emotional and practical aspects of self-management.<sup>28</sup> In our study, most participants felt that the help and support of family members (spouse, children, and parents) encouraged them to perform self-care behaviors. Based on the participants’ responses, marital status and the opinion of their spouse can have a significant influence on self-care behaviors related to nutrition and diet.

Moreover, the participants emphasized the impact of their parents’ knowledge and the role of their mother in medication adherence. The participants asked their families to approve their self-care behaviors. There is a positive relationship between medication adherence, social support, and family support from spouses and family members in other diseases.<sup>29</sup> However, Shima *et al.* found that some patients’ family members prevent them from taking anti-hypertension medications or encourage them not to change their diet by preparing salty foods.<sup>24</sup> Regarding medication adherence among elderly patients with hypertension, our results suggest that the support of their relatives and members of their social network has beneficial results. The reason for this is that physical diseases need more support and care from children and others.<sup>30</sup> During the interviews, some participants mentioned their friends as sources of information. According to a study on type 2 diabetes, friends and peers influence the patients’ treatment choices.<sup>31</sup> Moreover, Haidari *et al.* concluded that the education of patients with hypertension by peers leads to higher adherence to treatment, diet, and physical activity.<sup>32</sup>

Perceived behavioral control is one of the important variables affecting an individual’s ability to control decisions on performing self-care behaviors. Social, economic, and cultural problems affect self-care behaviors directly and indirectly. Many people cannot solve these problems, but they can mitigate the negative effects of their disease by learning, problem-solving, and making proper decisions. If patients are ensured that hypertension is controllable and they can follow the prescribed behaviors, then they most likely perform effective behaviors. According to Gerayllo *et al.*, a statistically positive correlation exists between perceived behavioral control and self-care behavior.<sup>33</sup> In a study by Heydarian *et al.*, self-control significantly affected the perceived pain severity and self-care behaviors of diabetes patients with neuropathy.<sup>34</sup> Self-control training can be used and inte-

grated with medical treatment to increase the recovery of hypertension patients. In this study, the participants had someone remind them to take their medications, but they also had other facilitators for self-care behaviors. Most of them mentioned two medication-related facilitators, i.e., having the medicine in their pocket or bag and having notes to remind them to take their medicine. According to Farmer *et al.*, a belief was associated with medication adherence: “Any change in my daily plan makes it difficult for me to use diabetes medicine regularly.”<sup>35</sup>

The participants tended to know more about how to control their diet and exercise. Moreover, patients are referred to health centers to eliminate their worries about undesired side effects and how to use their current medication. In a study by King *et al.*, health specialists played a vital role in teaching patients, while patients rarely received training about educational techniques and effective consultation. Health professionals could improve several important skills for blood sugar control through effective training and problem-solving, in order for patients to overcome self-care obstacles.<sup>36</sup> However, patients with hypertension did not receive precise information during follow-up in the health center in the study of Shima *et al.*, i.e., they were not referred to other healthcare providers, such as nutrition specialists, nurses, and other practitioners, to receive consultation on how to change their lifestyle.<sup>24</sup> Teaching healthy lifestyles, family consultation, and social support networks should be strengthened in health promotion programs to improve the patients’ quality of life.

Our study identified obstacles that interrupt the regular administration of prescription medication. Financial problems and accessibility were some of these obstacles. The cost was challenging for some patients because they were far from drugstores and worried about medication accessibility. These events may occur along with physical and mental moods because they provide patients access to treatment, medication, and peaceful life. Similarly to the present paper, another study conducted in Egypt indicated a significant relationship between the place of living and the quality of life of patients with hypertension.<sup>37</sup> Given that rural areas provide less opportunity for social activities and access to transportation than urban areas, patients living in rural areas experience social limitations. According to a study conducted by Zalak *et al.* in Iran, the high costs of blood sugar monitoring can prevent self-care among these patients. On the other hand, incomplete insurance in Iran may negatively affect the patients’ self-care behavior. Furthermore, poverty prevents diabetes patients from following a healthy diet.<sup>38</sup> However, there



is free access to consultation and treatment in all public health centers managed by the ministry of health and supported by the Malaysian government.<sup>39</sup> Regarding the necessity of rapid access of patients to medications and facilitating access to medical services, an extensive national plan can be designed and enacted for certain organizations, such as the ministry of health and treatment and insurance companies, to provide the required medicines for patients from the nearest drugstores.

Forgetfulness was one of the reasons preventing patients from taking medications regularly due to daily concerns and problems. Such observations have been reported for patients with heart failure.<sup>40</sup> In this case, interventions must be designed to improve treatment adherence, help patients to take medications regularly, and facilitate medication accessibility (e.g., patients should be trained to carry their medications under any circumstance). Our study highlighted the relationship between food culture in society and patients' diets. A similar study indicated the effect of cultural differences and diversity of food groups on individuals' diets.<sup>41</sup> In addition to awareness, cultural and social norms and obstacles undoubtedly play an important role in individuals' food choices. Therefore, the importance of perceived behavioral control over health behaviors highlights the necessity of increasing life skills, particularly resistance to social and cultural norms among patients, to improve their perceived control.

The participants reported that their physical activities were reduced, and they chose a sedentary lifestyle during the COVID-19 pandemic, mainly due to the closure of gyms and of stay-at-home orders. Similar findings were obtained by Woods *et al.*, reporting that the COVID-19 pandemic decreased the movement, exercise, and physical activities of individuals and affected their health.<sup>42</sup> The participants in our study mentioned that in this period, they rarely visited medical centers and physicians for monthly and annual checkups.

In spite of the correlation between intention and behavior, all intentions do not lead to actual behavior. In the process of converting intention to behavior, specific conditions must exist. On the other hand, perceived obstacles and limitations to performing the behavior should be removed, and enabling factors should be provided. Individuals who consider their blood pressure uncontrolled may create healthy changes, while they may not have the information to have such an intention.<sup>43</sup> According to the interviews, most patients referred to health centers intended to perform self-care behaviors. However, Lin *et al.* found that behavioral intention could not affect diet control and exercise variations.<sup>44</sup> This study indicated that a

multi-faceted relevant intervention is essential to depict the outcome of improved intention and permanent self-care behaviors among patients.

This result clarified that all three mentioned variables stimulate the patient's intention to perform self-care behaviors. The perceived behavioral control must be highlighted to apply this model for a lifestyle change. For instance, a plan should be designed for having a healthy diet, doing exercise or partial physical activities (even gardening and housekeeping activity helps), and subjective norms, such as regular empowerment of family members, physicians, or other healthcare staff.

## LIMITATIONS

This study was conducted on a small population with individual and cultural specifications, so caution must be taken when generalizing the result to a large population. Since face-to-face interviews were done during the COVID-19 pandemic, participants had poor cooperation due to the fear of being infected with COVID-19. This study used theory-based directed qualitative analysis, a limitation that forced the researcher to perform within a theoretical framework. However, data were collected through interviews and open-ended questions based on the theoretical framework, which could confirm the predetermined categories of TPB. The strengths of this qualitative study include the fact that it used a precise protocol with questions designed based on the constructs of TPB. We also consider that the number of participants was sufficient for a study that examined individual and environmental factors related to the TPB.

## CONCLUSIONS

The results highlighted the requirement for a multidimensional approach to improve attitude, subjective norms, and behavioral control for performing self-care behaviors that lead to a reduction in the number of hypertensive emergencies. Factors affecting self-care in critically ill patients with hypertension included socioeconomic status, family support, governmental organizations, and participants' health condition. We consider that healthcare plans should include comprehensive interventions to improve individual and environmental factors affecting self-care behaviors.

## CONFLICT OF INTEREST

Nothing to declare.

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