ASPI | Afarand Scholarly Publishing Institute; Turkey
ISSN: 2345-2897; Health Education and Health Promotion. 2025;13(2):357-362. 10.58209/hehp.13.2.357

# Adherence of Hypertension Patients to Self-Care Behaviors Based on the Health Action Process Approach in Southern Iran

ARTICLE INFO

*Article Type*
Descriptive Study

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How to cite this article
Faryabi R, Pournarani R, Movhed E. Adherence of Hypertension Patients to Self-Care Behaviors Based on the Health Action Process Approach in Southern Iran. Health Education and Health Promotion. 2025;13(2):357-362.

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*Article History*
Received: April 25, 2025
Accepted: June 20, 2025
ePublished: June 29, 2025

ABSTRACT

**Aims** Patients with hypertension must engage in self-care behaviors to control their condition and prevent complications throughout their lives. This study aimed to determine the predictive factors of adherence to self-care behaviors in patients with hypertension.

**Instrument & Methods** This descriptive-analytical study was conducted in 2024 on 451 patients with hypertension, selected using a multi-stage cluster sampling method. Data were collected using a researcher-developed questionnaire based on the constructs of the Health Action Process Approach (HAPA). The data were analyzed using SPSS 26 and descriptive statistical tests, Pearson correlation, and multiple regression analysis, with a significance level of 0.05.

**Findings** The mean score of the motivational phase constructs was higher than that of the volitional phase constructs. The risk perception (β=0.048), outcome expectations (β=0.602), and action self-efficacy (β=0.617) predicted 98% of the variance in the intention to perform self-care behaviors. Coping planning (β=0.038) and action planning (β=0.509) predicted 90% of the variance in self-care behavior. Maintenance self-efficacy (β=0.309) and recovery self-care behavior predicted 77% of the continuation of self-care behavior in patients.

**Conclusion** The HAPA-based multi-component intervention strategy can be a promising self-management mode for the routine healthcare of patients with hypertension.

**Keywords** Hypertension; Self-Care; Patients; Health Action Process Approach

CITATION LINKS

[1] Prevalence of high blood pressure and its associated ... [2] The prevalence of high blood ... [3] Hypertension in children ... [4] Childhood obesity, other cardiovascular risk factors, and premature ... [5] ecommendations for the use of dietary fiber to improve blood pressure ... [6] The seventh report of the joint national committee on prevention, detection, evaluation, and treatment ... [7] Evaluation of a self-management implementation ... [8] Lifestyle behaviors and receipt of preventive health care services among hypertensive ... [9] Medication adherence among hypertensive ... [10] The relationship between health literacy, self-efficacy, and ... [11] Assessment of adherence to self-care behaviors ... [12] Self-care assessment of patients ... [13] Self-care behaviors and related factors in hypertensive ... [14] State of the science: Promoting self-care in persons with heart failure: A scientific statement ... [15] Uncontrolled blood pressure in patients with ... [16] Relationship between health literacy and self-care of patients ... [17] Cultural factors and patients' adherence to ... [18] Hypertension, risk factors and ... [19] Factors influencing substance use relapse in people referring to addiction ... [20] A meta-analysis of the health ... [21] Changes in physical activity among coronary and hypertensive patients: A longitudinal study using the ... [22] Predicting psychological factors affecting regular physical activity in hypertensive patients: Application of ... [23] Explain the behavior change and maintenance in diabetic ... [24] The correlation between risk perception, outcome expectancies, task self-efficacy, and intention ... [25] The moderating effect of self-efficacy in ... [26] The impact of changing attitudes, norms ... [27] What predicts the physical activity ... [28] Increasing physical exercise through ... [29] The relationship between exercise intention ... [30] Predicting intention to participate in self-management behaviors in patients ... [31] Recovery self-efficacy and intention as predictors of running or jogging behavior: A cross-lagged ... [32] Weekly work–school conflict, sleep quality, and fatigue ... [33] The association between self-efficacy and hypertension self-care activities among ... [34] Changes in dietary behavior among coronary and hypertensive patients: a longitudinal investigation ... [35] The role of self-efficacy, recovery self-efficacy, and preparatory planning in predicting ...

## Introduction

Hypertension has emerged as a global public health issue with serious consequences for human health [1]. It affects approximately one billion adults and is associated with over 9 million deaths annually [2]. Recent research indicates that hypertension increases the vulnerability of adolescents to cardiovascular disease, kidney disease, and arterial wall dysfunction [3]. It is also associated with an increased risk of premature mortality in adulthood [4]. Several international, regional, and national guidelines recommend lifestyle interventions as the primary approach to managing hypertension [5].

Self-care behaviors play a crucial role in effectively managing hypertension [6, 7]. Patients with hypertension must adopt specific self-care behaviors such as adhering to medication, following a low-salt diet, engaging in regular physical activity, monitoring blood pressure regularly, avoiding alcohol consumption, and refraining from smoking throughout their lives [8, 9].

These patients have a significant need for self-care [10]. Despite the benefits of self-care behaviors in controlling hypertension, many patients fail to follow the recommended practices [10, 11]. The self-care status of these individuals often appears suboptimal [12-14]. According to Tarı Selçuk *et al.*, self-care behavior and low health literacy were identified as modifiable risk factors contributing to uncontrolled blood pressure [15]. A systematic review by Nohtani *et al.* found that patients with hypertension who had higher health literacy were more likely to control their condition [16]. Although some evidence suggests a correlation between health literacy and self-care behaviors, this evidence is limited. A key factor contributing to this gap may be a lack of motivation to engage in self-care behaviors.

In patients with hypertension, readiness, motivation, and adherence to lifestyle changes (especially efforts to control blood pressure and weight) are neither simple nor easy [17, 18]. These challenges suggest that implementing self-monitoring behaviors in these patients is far from simple, revealing a gap between awareness and actual practice. To address this, theories and models can be employed to identify and evaluate the factors that affect behavior formation and persistence [19].

The Health Action Process Approach (HAPA) is a highly effective theory that has significantly contributed to the understanding of factors affecting health behavior performance and maintenance [20]. HAPA posits that adopting a behavior requires individuals to progress through two distinct phases: Motivational and volitional. In the motivational phase, three key factors (risk perception, outcome expectation, and self-efficacy) shape behavioral intention. This prepares the individual to commit to a certain behavior and make related decisions. Once the behavioral intention is formed, the individual transitions to the volitional stage, where they plan the behavior by action planning and coping strategies. Finally, the constructs of coping self-efficacy and recovery self-efficacy lead to the continuation of the behavior [21].

Considering the importance of improving self-care behaviors in patients with hypertension and the need to bridge the gap between their knowledge and practice, coupled with the limited research applying the HAPA to self-care behaviors in this population, this study aimed to identify the key modifiable factors affecting adherence to self-care behaviors in patients with hypertension. The findings will inform the development of targeted educational interventions.

## Instrument and Methods

This descriptive-analytical study was conducted on 451 patients with hypertension in Jiroft city, Kerman province, in southern Iran, using a cluster sampling method. Each of the 12 comprehensive health centers in Jiroft was considered a cluster. Five centers were then selected using a simple random method, and patients from each center were selected based on the sample size. According to the national disease control guidelines, patients are typically followed up and cared for by a healthcare provider at least monthly and by a physician every three months. Patients visiting the selected centers from April 5 to October 5, 2024, were screened for eligibility. Those with a confirmed hypertension diagnosis (blood pressure of 140/90mmHg or higher) and residency in Jiroft were invited to cooperate. Depending on their willingness, participants completed and submitted the questionnaire either during the same visit or at a follow-up appointment. The exclusion criterion was an incomplete questionnaire. For patients with limited education, healthcare providers collected data through interviews.

Data were collected using a researcher-developed questionnaire, which consisted of demographic information (age, gender, education, and income), HAPA constructs, and self-care assessment questions. The risk perception construct included three items to measure patients' perception of hypertension-related risks. Responses were scored on a 4-point Likert scale from 1 (completely false) to 4 (completely true), with total scores ranging from 3 to 12. Higher scores indicated higher levels of risk perception. The outcome expectancy construct consisted of four items to measure patients' expectations (positive or negative) of self-care behavior outcomes. Responses ranged from 1 (completely false) to 4 (completely true) on a 4-point Likert scale, with scores ranging from 4 to 16. Higher scores reflected higher levels of outcome expectations. The action self-efficacy construct used eight items to measure patients' perception of their confidence to perform self-care behaviors. Responses were scored on a 5-point Likert scale ranging from 1

(completely false) to 5 (completely true), with scores ranging from 8 to 40. Higher scores denoted higher levels of action self-efficacy. The behavioral intention construct consisted of eight items to measure patients' intention to engage in self-care behaviors. Responses were on a 4-point Likert scale, with scores ranging from 8 to 32. Higher scores indicated higher levels of behavioral intention. The action planning construct consisted of three items to determine whether patients had clear and precise plans for self-care behaviors. Responses ranged from 1 (completely false) to 4 (completely true) on a 4-point Likert scale, with scores ranging from 3 to 12. Higher scores reflected better action planning. The coping planning construct consisted of four items to assess patients' plans for overcoming barriers to self-care behaviors. Responses were scored on a 4-point Likert scale from 1 (completely false) to 4 (completely true), with scores ranging from 4 to 16. Higher scores indicated higher levels of coping planning. The maintenance self-efficacy construct consisted of four items to assess patients' confidence in sustaining self-care behaviors in challenging situations. Responses ranged from 1 (completely false) to 5 (completely true) on a 4-point Likert scale. Possible scores for this scale ranged from 4 to 20, with higher scores indicating higher levels of maintenance self-efficacy. The recovery self-efficacy construct included three items to assess patients' confidence in resuming self-care behaviors after temporary lapses. Responses were on a 4-point Likert scale ranging from 1 (completely false) to 4 (completely true). Possible scores for this scale ranged from 3 to 12, with higher scores indicating higher levels of recovery self-efficacy. Seven yes/no questions measured self-care behaviors, scored as 1 (yes) or 0 (no), yielding a total score range of 0 to 7.

To ensure content validity, the HAPA and self-care behavior questionnaires were prepared using reputable scientific sources and reviewed by five health education professors and two experts in non-communicable diseases with relevant expertise. Content validity was assessed using the Content Validity Ratio (CVR) and the Content Validity Index (CVI), and the obtained scores were compared with those of the Lawshe scale. Items with an Item-Level CVI (I-CVI) of 75% or lower were removed. After making the necessary corrections, the questionnaire was re-evaluated by experts, achieving an I-CVI above 0.8 for all items. The face validity of the questionnaire was confirmed by examining feedback from four hypertensive patients, who found all items to be understandable. Results of reliability in a pilot sample of 30 participants over 14 days by Cronbach's alpha (α) and the Intraclass Correlation Coefficient (ICC) were acceptable for risk perception (α=0.71, ICC=0.74), outcome expectations (α=0.74, ICC=0.91), task self-efficacy (α=0.88, ICC=0.71), behavioral intention (α=0.93, ICC=0.82), action planning (α=0.93, ICC=0.70), coping planning (α=0.93, ICC=0.72), maintenance self-efficacy (α=0.71, ICC=0.72), and recovery self-efficacy (α=0.94, ICC=0.93).

This article is based on a research project of Jiroft University of Medical Sciences, which was approved by the Research Ethics Committee of Jiroft University of Medical Sciences. In the present study, in order to comply with ethical considerations, the purpose of the study was fully explained to the participants before completing the questionnaires, and a written informed consent form was completed by the subjects.

The Kolmogorov-Smirnov test showed the normal distribution. The data were analyzed using SPSS 26, employing Pearson correlation and multiple regression analysis with a significance level of 0.05.

## Findings

Of the 451 participants, 48.11% were 50-60 years old (n=217), and 54.78% were female (n=247). 48.55% of participants (n=109) had lower/upper secondary education (Table 1).

**Table 1.** Demographic frequency of the participants (n=451)

| Parameter | | Frequency (%) |
|---|---|---|
| **Age** (year) | 40-50 | 123 (27.27) |
| | 50-60 | 217 (48.11) |
| | 60-70 | 103 (22.83) |
| | 70-80 | 8 (1.77) |
| **Gender** | Male | 204 (45.23) |
| | Female | 247 (54.76) |
| **Education level** | Lower/upper secondary | 219 (48.55) |
| | Diploma and an associate's degree | 190 (42.12) |
| | Bachelor's degree and above | 42 (9.31) |
| **Monthly income** | Less than $200 | 126 (27.93) |
| | Between $200 and $400 | 256 (56.76) |
| | Above $400 | 69 (15.29) |

The mean self-care score among participants was 6.53±0.60 (ranging from 4 to 7). The mean scores for the motivational phase constructs were higher than those for the volitional and behavioral continuation phases (Table 2).

**Table 2.** Mean score of the HAPA constructs in the study group

| Approach phases | | Mean | SD | Min. | Max. |
|---|---|---|---|---|---|
| **Motivational phase** | Risk perception | 7.62 | 0.74 | 5 | 9 |
| | Outcome expectation | 11.22 | 1.25 | 8 | 15 |
| | Task self-efficacy | 17.43 | 1.99 | 14 | 24 |
| **Volitional phase** | Behavioral intention | 17.43 | 1.99 | 14 | 24 |
| | Action planning | 7.27 | 1.07 | 6 | 9 |
| | Coping planning | 7.30 | 1.49 | 4 | 12 |
| **Continuation phase** | Maintenance self-efficacy | 7.31 | 1.47 | 4 | 12 |
| | Recovery self-efficacy | 4.96 | 0.51 | 5 | 7 |

The risk perception (β=0.048), outcome expectations (β=0.602), and action self-efficacy (β=0.617) predicted 98% of the variance in the intention to perform self-care behaviors. Coping planning (β=0.038) and action planning (β=0.509) predicted 90% of the variance in self-care behavior. Maintenance self-efficacy (β=0.309) and recovery self-care behavior predicted 77% of the continuation of self-care behavior in patients (Table 3).

**Table 3.** Results of multiple regression

| Parameter | B-coefficients | β coefficients | t | p-Value | $R^2$ |
|---|---|---|---|---|---|
| **Intention to perform self-care behavior** | 0.136 | - | 1.222 | 0.222 | 0.98 |
| Risk perception | 0.048 | 0.180 | 3.083 | 0.02 | |
| Outcome expectation | 0.602 | 0.379 | 26.763 | 0.001 | |
| Task self-efficacy | 0.617 | 0.621 | 43.341 | 0.001 | |
| **Self-care behavior** | 3.39 | - | 28.81 | 0.001 | 0.90 |
| Behavioral intention | -0.048 | -0.156 | -6.263 | 0.001 | |
| Action planning | 0.509 | 0.901 | 28.929 | 0.001 | |
| Coping planning | 0.038 | 0.094 | 2.926 | 0.004 | |
| **Continuation of self-care behavior** | 3.997 | - | 27.64 | 0.001 | 0.77 |
| Maintenance self-efficacy | 0.309 | 0.751 | 23.035 | 0.001 | |
| Recovery self-efficacy | 0.061 | 0.059 | 1.82 | 0.069 | |

## Discussion

The present study aimed to determine the predictive factors of adherence to self-care behaviors in patients with hypertension in southern Iran, based on the Health Action Process Approach.

The results of the multiple regression analysis showed that the constructs of risk perception, outcome expectations, and task self-efficacy accounted for 98% of the variance in the intention to perform self-care behavior. Among these, task self-efficacy emerged as the strongest predictor of self-care intention (β=0.61), followed by outcome expectations (β=0.60) and risk perception (β=0.04).

These findings align with those of Mohammadi Zeidi *et al.*, who reported task self-efficacy as the most important predictor of physical activity intention in hypertensive patients, with outcome expectations and risk perception also demonstrating statistically significant effects on intention [22]. Wu *et al.* identified perceived barriers, perceived benefits, and task self-efficacy as key predictors of intention [23]. Furthermore, Tajaruddin *et al.* found a significant correlation between risk perception, outcome expectations, task self-efficacy, and intention regarding diet adherence in patients with type 2 diabetes [24]. WHO has reported that 46% of adults with hypertension are unaware of their condition [25]. According to health behavior theories, health behaviors are influenced by health intentions and beliefs, including risk perceptions, outcome expectations, and self-efficacy beliefs [26]. A study by Soylu & Tanrıverdi observed moderate levels of risk awareness, self-awareness, and treatment compliance among the study participants. Risk awareness was positively correlated with treatment compliance and self-efficacy [25]. Therefore, interventions focusing on enhancing risk perceptions, outcome expectations, task self-efficacy, and intention factors through educational and counseling activities are necessary to improve blood pressure control behaviors in patients with hypertension.

The results of the multiple regression analysis showed that the action planning and coping planning constructs predicted 90% of the variance in self-care behavior. Action planning was the strongest predictor (β=0.509), followed by coping planning (β=0.038).

Mohammadi Zeidi *et al.*'s study demonstrated that HAPA constructs accounted for 31% of the variance in physical activity behavior among hypertensive patients [22]. Wu *et al.* demonstrated that changes in the physical environment influence intention, with perceived disadvantages having a negative impact. Intention had a positive effect on action planning and coping planning [23]. The intention-behavior gap has long been recognized as a barrier to changing health behavior, and action planning and coping planning can bridge this gap [27].

Wee & Dillon showed that intention, past exercise habits, and action planning were significant predictors of changes in physical activity behaviors [28]. Lee *et al.* found that the strength of the intention-behavior relationship in exercising increased linearly with higher levels of action planning and maintenance self-efficacy [29].

While intentions are important predictors of behavior change, developing habits to engage in activities related to a healthy lifestyle and chronic disease management appears to be even more important than intention alone. Furthermore, action planning can be a useful intervention to bridge the intention-behavior gap, thereby enhancing overall self-care and preventive behaviors [30].

The results of the multiple regression analysis showed that the constructs of maintenance self-efficacy and recovery self-efficacy accounted for 77% of the variance in self-care behavior. Maintenance self-efficacy was the strongest predictor (β=0.30), followed by recovery self-efficacy (β=0.061).

A study by Luszczynska *et al.* demonstrated that recovery self-efficacy and intention jointly predicted running behavior over two years. However, unlike the present study, where maintenance self-efficacy was the most important predictor of self-care behavior continuation in hypertensive patients, maintenance self-efficacy did not predict running behavior in their research [31]. In a study by Park & Sprung, recovery self-efficacy was found to be an important factor that moderated the association between poor sleep quality (resulting from work-school conflict) and fatigue [32].

Given that recovery self-efficacy remained the only significant predictor of social cognitive behavior in health behaviors among individuals, who experienced a lapse in health behaviors [31]. Given the

favorable status of planning self-efficacy and action self-efficacy in the present study, it is possible that the participants in this study experienced fewer relapses than those in the studies mentioned above. This could highlight the role of maintenance self-efficacy versus recovery self-efficacy in this specific context. On the other hand, specific behaviors under study in the studies mentioned above and the present study may have contributed to this difference.

In the study by Warren-Findlow *et al.,* more than half of the participants reported having good self-efficacy in managing their blood pressure. Notably, good self-efficacy was statistically associated with a higher prevalence of medication adherence, a low-salt diet, physical activity, non-smoking, and the use of weight management techniques [33]. Conversely, Steca *et al.* found that hypertensive patients showed no change in dietary behavior. In contrast, coronary patients improved their nutrition for up to six months and then maintained a healthier diet [34]. It is possible that the higher risk perception in coronary patients increased their intention, behavior change, and persistence of behavior compared to hypertensive patients.

Elfeddali *et al.* indicated that relapse at one and three months after low levels of baseline self-efficacy predicted a quit attempt. They also showed that less initial planning significantly predicted relapse at one month, and recovery self-efficacy only predicted relapse after the first month [35]. Pournarani *et al.* showed a positive and significant relationship between recovery self-efficacy and relapse, with low levels of action planning and action self-efficacy being the most important predictors of relapse [19]. Effective chronic disease management relies on individuals who engage in a variety of self-care behaviors. Self-efficacy, a widely used psychosocial concept, is associated with the ability to manage chronic disease [33].

Our study had limitations. The use of self-reports for data collection introduces the potential for reporting bias. To address this limitation, data were collected anonymously whenever possible. Our results suggest that enhancing HAPA constructs in this population, especially risk perception, outcome expectations, task self-efficacy, action planning, and maintenance self-efficacy, can strengthen self-care behaviors and promote their adoption and continuation. Additionally, it is recommended that planners and experts utilize the theoretical framework of this approach when developing educational interventions aimed at promoting healthy behaviors.

## Conclusion

The HAPA-based multi-component intervention strategy can be a promising self-management mode for the routine healthcare of patients with hypertension.

**Acknowledgments:** We would like to sincerely thank all the officials of the comprehensive health service centers and healthcare providers who cooperated in carrying out this project, as well as all the participants who assisted us in this research.

**Ethical Permissions:** This article is based on a research project financially supported by the Vice-Chancellor for Research and Technology of Jiroft University of Medical Sciences and approved by the ethics committee of the Ministry of Health of Iran (code of ethics: IR.JMU.REC.1402.033).

**Conflicts of Interests:** The authors declare no conflicts of interest.

**Authors' Contribution:** Faryabi R (First Author), Introduction Writer/Methodologist/Main Researcher/Discussion Writer/Statistical Analyst (40%); Pournarani R (Second Author), Introduction Writer/Assistant Researcher/Discussion Writer (40%); Movhed E (Third Author), Methodologist/Assistant Researcher/Discussion Writer/Statistical Analyst (20%)

**Funding/Support:** This research received no external funding.

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