

## The effect of training based on the theory of planned behavior on self-care of cardiovascular disease risk factors in health ambassadors.

### Abstract

Non-communicable diseases account for 76% of all causes of death today; more significantly, cardiovascular disorders account for 46% of non-communicable disease causes of death. Teaching individuals about risk assessment and self-care is a critical part of the approach to preventing chronic diseases. This study compares the impact of planned behavior theory-based training on cardiovascular disease risk factor self-care among health ambassadors from Mashhad Health Centre No. 1's rural districts. For a randomized controlled trial investigation, ninety-four rural health ambassadors from Mashhad Health Centre No. 1 were randomly assigned to two experimental and control groups. After the needs of the test group were determined within the context of the theory of planned behavior, an educational intervention was developed and implemented. Three months after the educational intervention ended, both groups were re-surveyed, and the data were analyzed using statistical software (SPSS version 24) and tests like Chi-2, Mann-Whitney, Friedman, ANOVA, and Kolmogorov-Smirnov. The behavioral intention, perceived ability, control beliefs, desire to follow, normative views, outcome evaluation, and behavioral beliefs. All components of the theory of planned behavior did not show any significant differences between the two groups in the pre-intervention phase. Nevertheless, the adjustments made after the theory of planned behavior items showed a significant statistical difference in average scores both immediately after the training group intervention and three months later. ( $p$  greater than 0.0001). Overall, the study's findings demonstrated that developing self-care skills and recognizing cardiovascular disease risk factors can significantly lower the incidence of cardiovascular diseases. Health ambassadors' intention to practice self-care is significantly increased when training programs are designed and implemented using the theory of planned behavior.

**Keywords:** self-care, theory of planned behavior, cardiovascular diseases, risk factors, health education, health ambassador

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### Introduction

Today, societies are facing rapid changes and huge social progress due to the development process. Due to the increasing age of the population, the share of non-communicable diseases like cardiovascular disease, the amount of deaths, and the financial burden due to health is increasing at a significant speed. Currently, non-communicable diseases are responsible for more than 76% of the burden of disease worldwide, and by 2020, these factors are expected to cause 60% of the total burden of disease and 73% of all deaths, of which 80% are in developing countries. Occurs in development. In the meantime, non-communicable diseases account for more than 76% of Iran's overall disease burden (1). The identification of primary risk factors and the prevention and control of these factors form the foundation for the prevention of non-communicable illnesses. Risk factors such as inactivity, environmental pollutants, smoking, alcohol, unhealthy diet, high blood pressure, diabetes, etc. are among those that can be

controlled promptly and have a great effect on maintaining people's health. (2)

Enhancing consciousness, acknowledging accountability, empowering individuals, families, and society through organized and proactive engagement in promoting, maintaining, and enhancing health through the utilization of national cultural, educational, and media establishments and associations overseen by the Ministry of Health, Treatment, and Medical Education is one of the policies of the Ministry. It is health and treatment that can contribute to controlling diseases and increasing people's quality of life (3). On the other hand, it can be mentioned that education to the patient and his family is considered a special part of care programs, which actively involves the patient in self-care in order to control chronic diseases and causes faster recovery, and better coping with the existing situation (4). Self-care is a new trend in providing health care and it is the type of health improvement measures that are implemented by the people of the society. Self-care refers to the activities that people do to improve their

health, prevent disease, and maintain their health. Although knowledge and skills are taught to people, these procedures are carried out without the assistance of professionals (4).

Self-care improves health and quality of life, increases patient satisfaction, rationalizes the use of services, and reduces health costs. Strong evidence shows that by promoting self-care as a people-based health approach, we can expect to see a 7% savings in costs. These savings reduce the cost of basic and specialized care as well as scheduled and unscheduled patient admissions and outpatient admissions (5).

In line with the implementation of services in the context of society, the Islamic Republic of Iran initially attracted the sick by establishing health houses in the villages and selecting local people with diploma literacy, most of the services were offered in the context of the communities (6) and later the project of health volunteers was implemented. who were the people who formed a link between health officials and the people without taking a salary and only because of love and humanity and a sense of responsibility towards the health of the society and helped to provide basic health services in the society. The health system, the national self-care program as the fifth national health system transformation program in the field of health design and self-care package was announced on 7/18/2014, under letter No. 300/11036 of the Honorable Deputy Health Minister for implementation According to this notification, self-care should be implemented at the three levels of the family, organization and society, which is following the three strategies of education at the level of individual growth or personal growth in order to change the behavior of the individual, education at the level of the organization or organization and through that change in Individual's behavior and education is at the level of society and through that ultimately change in individual's behavior (7). Since the ultimate goal of education is to change a person's behavior, education will be a series of activities planned to influence behavior, and education as a change strategy must be different from other legal or mandatory strategies to change behavior. On the one hand, as health ambassadors, they must be people who convey self-care messages in cardiovascular diseases and behave towards them, so they must have strong behavioral intention, on the other hand, the determinants of behavioral intention include attitude towards performing the behavior and abstract norms along with the behavior. to be strengthened in them (8). Consequently, it appears that training health ambassadors according to the theory of planned behavior can raise individual motivating factors, which are then followed by behavioral intention. The goal of this study is to ascertain how ambassador behavior is affected by training according to the aforementioned theory. Health is self-care in the implementation of the national program.

## **2. Theoretical foundations**

### **2-1. An overview of the concept of self-care:**

Self-care is a new trend in providing health care, and it is the type of health improvement measures that are implemented by the people of the society. Self-care refers to the activities that people do to improve their health, prevent disease, and maintain their health. Although knowledge and skills are taught to people, these procedures are carried out without the assistance of professionals (4).

### **2-2. Self-care history:**

In line with the implementation of services in the context of society, the Islamic Republic of Iran initially attracted the sick by establishing health houses in the villages and selecting local people with diploma literacy, most of the services were offered in the context of the communities (6) and later the project of health volunteers was implemented. who were the people who formed a link between health officials and the people without taking a salary and just because of love and humanity and a sense of responsibility towards the health of the society and made a great contribution to the provision of basic health services in the society (11) at present In the health system transformation program, the national self-care program was announced as the fifth national health system transformation program in the field of health design and self-care package on 7/18/2014, under the letter No. 300/11036 of the Honorable Deputy Health Minister for implementation. According to this notification, self-care should be implemented at the three levels of the family, organization, and society, which is in accordance with the three strategies of education at the level of individual growth or personal growth in order to change the behavior of the individual, education at the level of the organization or organization and through that change in Individual's behavior and education is at the level of society and through that ultimately change in individual's behavior (7).

### **3-2 Socio-economic status and self-care situation:**

Self-care is the first step to health. Between 65 and eighty-five percent of the care that leads to our health is the product of self-care, that is, the activities that we or our family do to maintain or improve health, prevent disease, and treat or reduce its complications. (12).

### **2-4 The necessity of developing a theory-based health education program**

Health education and health promotion provide the best guarantee for less expensive methods to limit the uniform increase in health care costs and empower people to accept responsibility for aspects of their lives that promote well-being and ensure health (13). Besides, it is one of the best and most efficient health activities to prevent risk factors and diseases

(14). Because the purpose of health education is to change unsafe and unhygienic behavior to behaviors that lead to the promotion and maintenance of people's health (15). However, behavior change is more difficult to achieve through talking or traditional training (16). In order to solve this problem and improve the effectiveness of health education, experts in this profession, including Glanz and his colleagues, believe that a combination of theory, research, and practice is effective in improving the available information about health behavior. A health education trainer without using theory is just a technician, while experts who have a correct understanding of theory and model can go after why training is done and its effectiveness and perform the desired intervention (17). On the other hand, from this point of view, the theory seems to be important for the health education profession, this can be applied at many phases of program development, execution, and assessment. It also serves to advise and direct the work of health educators. In the behavioral and social sciences, theory offers a framework for comprehending why individuals choose to engage in risky or health-threatening behaviors as well as how or why they can choose to engage in health-protective behaviors (18).

#### **4-2 Theory of planned behavior:**

During the years 1970 to 1980, due to the spread of social factors, much emphasis has been placed on behavior as a determinant of health status in the fields of health education and healthy behavior (8). Numerous educational, public, and private initiatives as well as commercial services have emerged as a result of the growing interest in behaviour and the factors that determine health. Meanwhile, the goal of health education is to transmit information about health behavior as well as to comprehend health behavior., creating an effective strategy to increase the amount of health behavior, and this will be possible through influencing the improvement of the health of the society. On the other hand, health education and health behavior specialists are among the most important interventionists who focus on behavior. They use their knowledge to design and implement programs related to health promotion and, in fact, work towards making positive changes in individuals or society. Since the majority of health educators are in different situations with limited resources, it is possible to design interventions that include desirable changes through understanding patterns and theories of behavior change and the ability to skillfully use them in practice. Therefore, health professionals, such as health educators, psychologists, nutritionists, and nurses, who focus on behavior change, must determine the role of people in adopting health behaviors in order to apply effective interventions and correctly judge how to measure the impact of these interventions. The theory of planned behavior is a set of individual theories that has a great

impact on health research, performance behavior, and health education (8).

#### **5-2 Designing and developing the theory of planned behavior:**

In 1975, Fishbein and Ajzen introduced the notion of reasoned action, this theory linked beliefs to attitudes that are related to intentions leading to behavior. In 1980, the joint team of Aysek Ajzen and Martin Fishbein published a book entitled *Understanding Attitudes and Predicting Social Behavior*, which facilitated the theory of action by Ajzen, made it logical and practical for use in different fields, and during the 1980s in It became popular among researchers and practitioners. Professor Ajzen and some researchers believed that this hypothesis was inadequate to explain behavior, particularly in those who are not able to execute their behavior well. As a result, he introduced the theory of rational action and a new framework known as perceived behavioral control, which opened the door for the concept of planned behavior to develop. Francis and colleagues (2004) created a manual to help health service researchers organize questions based on the notion of planned behavior (19).

#### **6-2 The basis of the theory of planned behavior:**

Both theories of rational action and planned behavior emphasize theoretical structures in relation to individual motivational factors, and both theories accept intention as the most substantial predictor of behavior, the intention itself is determined by the attitude towards behavior and social beliefs about it. As mentioned above, the theory of planned behavior includes another construct related to the control of behavior. Both the theory of reasoned action (TRA) and planned behavior (TPB) argue that before deciding whether or not to engage in any specific behavior, people examine the issues facing their actions, which is in fact consistent with Freud's theory and other theories related to behavior. They are different and seen as being controlled by unconscious impulses or inclinations. On the other hand, according to the theory of logical action, one of the most important determinants of behavior is the intention of the behavior, so the success of the theory in explaining the behavior depends on the degree of voluntary control over the behavior, and it is a situation where people have a large degree of control over the behavior. The theory of planned behavior and the theory of reasoned action both rely heavily on the ideas of attitude, abstract thinking, and perceived control. They predict many different types of behaviors, including those connected to health, and they contribute significantly to the variation in behavioral intention. Numerous findings from published intervention research have demonstrated that modifications to the theory of reasoned

action and planned behavior constructs result in behavioral changes that follow (8).

## **7-2 Structures of the theory of planned behavior:**

**Behavior:** The first structure of the theory of logical action and planned behavior is behavior, which usually includes a single action that is performed by a person and can be observed, such as obeying traffic rules, wearing a seat belt, consuming 5 servings of vegetables and fruits, using condoms, etc. (8, 19).

**Behavioral intention:** Behavioural intention is the second concept in the idea of planned behavior. This structure involves the act of thinking in order to carry out the behavior, which is what immediately determines a certain behavior. The focal point of this model is its structure, and the theory of rational action highlights that behavioral purpose is the primary component influencing behavior (8, 19).

**Attitude toward behavior:** Attitude towards behavior, which is the third theoretical framework, describes the overarching sentiment of favoring or opposing a particular behavior. Conversely, the more positive one's attitude towards a behavior is, the more probable one is to intend to engage in it, the more unfavorable a person's attitude is towards a behavior, the more likely he is not intending to do that behavior. In 1967, Fishbein proposed the theory of rational action to understand the relationship between attitudes, intentions, and behavior. Fishbein distinguished between attitude towards a goal and tendency towards behavior related to that goal. For example, most theories measure attitude toward behavior (such as attitude toward cancer), but in an attempt to predict behavior (such as mammography or breast cancer screening), Fishbein and Ajzen postulated that attitude toward behavior is a better predictor of behavior performance. to the attitude towards the goal to which the behavior leads (8, 19).

**Behavioral beliefs:** The fourth structure is a determinant of attitude towards behavior, which is called behavioral belief, and behavioral belief is the belief that leads to a specific behavior and certain consequences (19).

**Evaluations of behavioral consequences:** The fifth structure of the theory of planned behavior is evaluations of consequences or the value that an individual assigns to each of the outcomes of engaging in the intended behavior. The attitude towards the behavior is determined by the combination of behavioral beliefs and outcome evaluations (19).

**Abstract soft or subjective norm:** The sixth structure of this model is called subjective norm and it refers to a person's belief that most of the important people in his life think he should or shouldn't perform the desired behavior. A person's abstract norms (mental norms) are determined by normative beliefs, so if a person believes that certain clients expect him, should perform a behavior, and he also has the motivation to meet the client's expectations, he has a positive abstract norm, and a

person who believes in this that specific clients expect that he should not perform a behavior and the motivation to meet the client's expectations is low, has a neutral abstract norm. Mental norms are formed by two structures, namely, normative beliefs, and motivation to follow (8, 19).

**Normative beliefs:** the way a person thinks about how other people who are important in his life tend to behave (19)

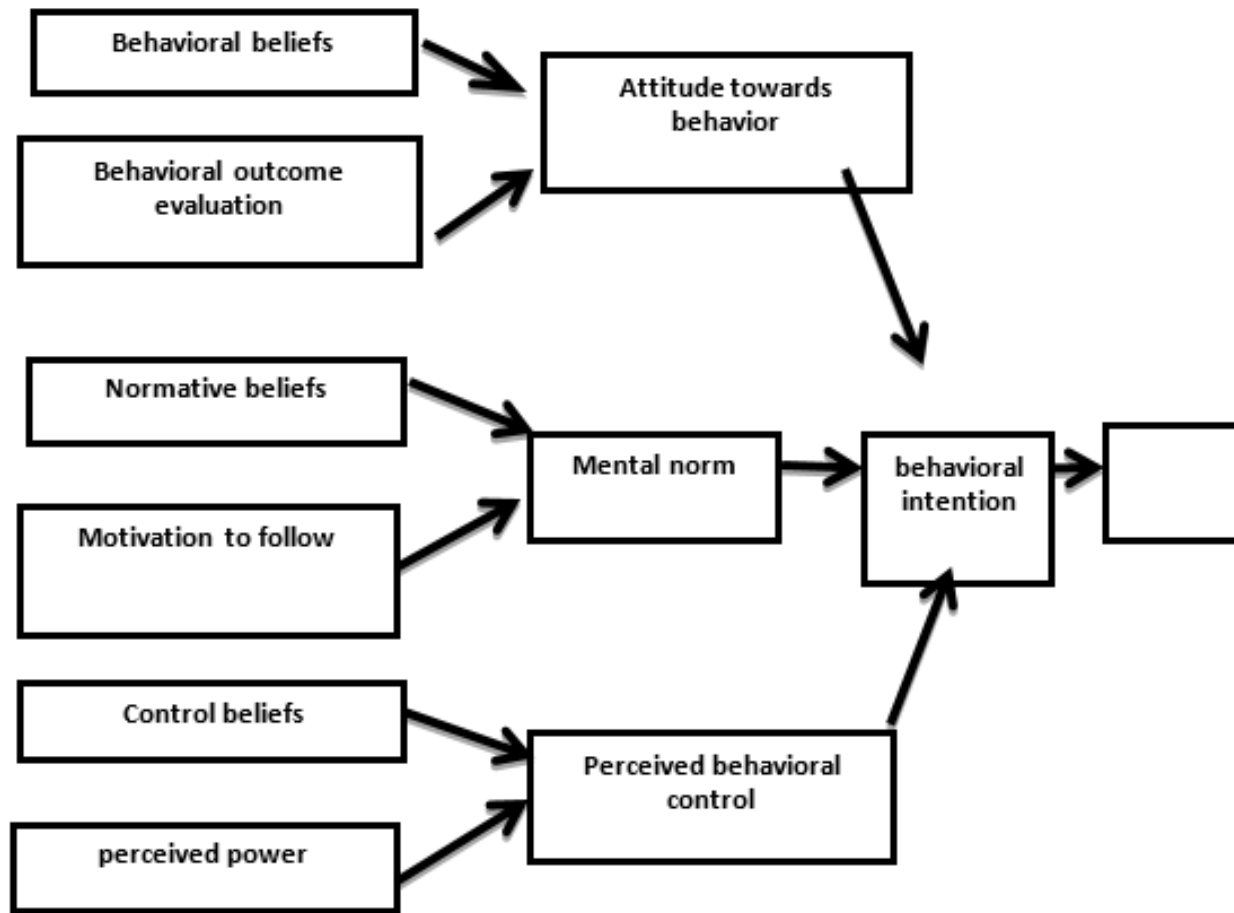
**Motivation to follow:** It refers to the degree that, in the form of that person, he wants to act in accordance with the perceived desires of important people in his life (19).

**Perceived behavioral control:** It is a crucial concept within the idea of planned behavior, pertaining to an individual's level of confidence in their ability to perform in a way that accords with the prescribed behavior. The perception of power and control are prerequisites for this structure (19).

**Control beliefs:** include convictions about elements, both internal and external, that can facilitate or prevent behavior (20).

**Perceived power:** refers to an individual's assessment of the ease or difficulty of carrying out a behavior in any circumstance when the individual's control beliefs are defined (20).

Ajzen and his colleagues added perceived behavioral control to the theory of rational action in order to enumerate factors outside of a person's control that are effective on behavioral intention, and thus the model of planned behavior was created. Perceived power or influence of any control factor on facilitating or inhibiting behavior is used to measure perceived control beliefs about the existence or absence of facilitators or barriers to behavior. Ajzen considers perceived control as an opinion that behavior is formed based on a combination of motivation and ability of the individual, so when the perception of individual behavioral control is high, a person spends a lot of effort to perform the behavior (8).



**Figure 1.** Overview of the theory of planned behavior

One of the implementation measures of this national plan is the recruitment of health ambassadors who are recruited and trained voluntarily from among households, employees of organizations, and localities of the society, and the health ambassador is a member of a family who has at least 8 classes of reading and writing literacy and is voluntarily responsible. He is responsible for transferring the learned material in the field of health and actively taking care of his health and that of his family members and society (21). Since the ultimate goal of education is to change a person's behavior, education will be a series of activities that are planned to influence behavior, and education as a change strategy must be different from other legal or mandatory strategies to change behavior. On the one hand, as health ambassadors, they must be people who convey health messages and behave towards them, so they must have

strong behavioral intention, on the other hand, the determinants of behavioral intention include the attitude towards performing the behavior and the abstract norms associated with the behavior in them. to be strengthened (8) The goal of this study is to ascertain the impact of training based on the aforementioned theory on the behavior of health ambassadors in light of the possibility that the theory of planned behavior can increase individual motivational factors, which will then be followed by behavioral intention. Self-care is the national program being implemented.

**background research**

The review of past studies (domestic and foreign texts) is based on studies and articles published in Google Scholar, GetCITED, Microsoft Academic Research, and Scopus.

### 3-1 review of internal texts

A study titled "Effect of educational intervention based on the theory of planned behavior on breast self-examination in women referring to health centers" was conducted in 2016 by Metabli et al. (22). In this field trial investigation, two experimental and control groups of 140 married women in Gonabad City, ages 20 to 49, were assigned at random. After identifying the educational needs, the curriculum was put together and presented in five meetings. Using IBMSPSS version 20, variance analysis tests with repeated observations, t-student, and multivariate variance analysis, breast self-examination behavior was examined before, immediately after, and three months after the training. At a significance threshold of 0.05, it was examined. 37.27±6.69 years was the average age of the samples. Three months after the intervention, the effect of the educational intervention was still evident as the average self-test skill score climbed from 17.89 to 18.26 and the average theoretical construct score in the intervention group considerably increased ( $p < 0.001$ ). It's apparent. However, in the control group, these modifications had no discernible effect.  $P > 0.05$

Another study titled "Effect of training based on the theory of planned behavior on the consumption of low-value snacks in middle schools of Chenaran" was conducted by Peyman et al. in 2013(23). Fifty eighth-year male students from Chenaran City participated in this semi-experimental study. They were divided into two groups at random, one for the test and the other for the control. Questionnaires were used to gather the data. The factors under investigation were assessed prior to, during, and following the intervention by one month. Following that, the data were examined using SPSS 18 and the Mann-Whitney, Wilcoxon, Paired T-test, Independent T-test, and Chi-square statistical tests. The test group's consumption of low-cost snacks decreased following the intervention, and their awareness score significantly changed from 4.72±2.48 to 6.4±2.29 ( $p < 0.001$ ), the abstract norm of 2.87±2.10.56 to 13.36±3.98,  $p < 0.001$ , perceived behavioral control from 14.88±3.19 to 17.24±3.13,  $p < 0.001$  and intention Behavior from 12.6±1.42 to 7.24±2.00 ( $p = 0.004$ ) was found in the test group, but these changes were not significant in the attitude score.

In District 4 of Tehran, Ramzan Khani and associates carried out a study in 2012 with the title "Effect of health education based on the theory of planned behavior in promoting safe street crossing behaviors in students (24). For the randomized controlled trial-style study, 160 fourth-graders (80 girls and 80 boys) who were selected at random from Tehran's District 4 schools were split into 2 experimental and control groups. After the needs of the test group were determined within the framework of the theory of planned behavior, an educational

intervention was developed and implemented. After the instructional session ended, both groups were observed for two months, and data analysis was done using SPSS, a statistical software program, version 16.

In terms of demographics, behavior, and the theory of planned behavior's constructs—behavioral intention, perceived ability, control beliefs, motivation to follow, normative beliefs, outcome evaluation, and behavioral beliefs—there were no discernible differences between the two groups during the pre-intervention phase. Following the intervention, behavioral intention dimensions showed no discernible change ( $p > 0.001$ ) between the two test and control groups. perceived ability ( $p > 0.001$ ), control beliefs ( $p > 0.001$ ), motivation to follow ( $p > 0.001$ ), normative beliefs ( $p > 0.001$ ), consequence evaluation ( $p > 0.001$ ), behavioral beliefs ( $p > 0.001$ ) and safe behaviors of crossing the street ( $p > 0.001$ ) a significant difference was observed.

Selahi et al. carried out a second study titled "Designing and implementing an educational program to promote physical activity among students based on the theory of planned behavior". This research is a field trial study. For this purpose, four middle schools (two girls' schools and two boys' schools) were selected among the middle schools, then two schools were considered as the intervention group (150 people), and two schools were considered as the control group (150 people). Before and two months after the educational intervention, the participants filled out the questionnaires. Ultimately, SPSS version 13 statistical software was used to analyze the data, and chi-square, independent t, and paired t-tests were employed. Findings: The obtained results show a significant difference in mean attitude ( $p < 0.003$ ), behavioral intention ( $P < 0.0001$ ), abstract soft ( $P < 0.0013$ ), and perceived behavioral control ( $P < 0.0001$ ) between the students of the intervention and control groups were after the educational intervention. Also, the amount of engaging in physical activity among students in the intervention group increased significantly after the educational intervention ( $P < 0.0001$ ).

Amini et al. conducted a study named "Effectiveness of e-learning program on increasing female employees' body mass index and amount of physical activity". Using a practical sample technique, 120 participants were chosen for this semi-experimental interventional investigation into two intervention and control groups. The data collection tool (number = 120) was a demographic questionnaire and an international physical activity questionnaire. Questionnaires were completed as pre-test and post-tests in two intervention and control groups with an interval of 2 months after the last training in the intervention group. Female employees in the intervention group received trainings for 16 weeks virtually through email or office automation, short messages, and training videos. At the end of the research, the data were analyzed with chi-square tests,

Fisher's exact test, independent t, and paired t-test using SPSS 17 software.

In this study, the average age of the women was 39 years for the control group and 41 years for the intervention group. In both categories, the majority of the women were married, had one or two kids, and held a bachelor's degree. Following the training, the intervention group's average physical activity score increased significantly ( $p < 0.001$ ) in comparison to the control group. The average score of body mass index after training in the intervention group did not show a significant change compared to the control group ( $p = 0.119$ ), but compared to itself compared to before the training, it showed a significant decrease ( $p > 0.001$ ).

Another study titled "Determining the effect of health education intervention based on the theory of planned behavior in order to promote physical activity in women in Shushtar city health centers" which was conducted by Jafar Pour et al. in Shushtar city health centers in 2014 (27). 110 medical staff members from Shushtar City's health centers participated in this interventional trial. Groups for testing and controls were randomly assigned to individuals. A heart rate test using a Polar device, an international physical activity scale, a theory of planned behavior questionnaire, and a demographic questionnaire were used to gather data. The intervention consisted of a three-month physical exercise program and three theory-based training sessions. The statistical program SPSS was used to analyze the data (version 19). A significance level of less than 0.05 was applied to the p-value.

The implementation of the theory-based educational program improved the constructs of attitude towards behavior, perception of behavioral control, intention, physical activity and reduced the physiological cost index in the test group in 3 months after the intervention ( $p < 0.05$ ); But there was no significant change in the control group ( $p < 0.05$ ). Also, after the intervention, there was no significant difference in the structure of abstract norms in the two groups ( $p < 0.05$ ).

Another study titled "Effect of educational intervention based on the theory of planned behavior on the physical activity of the employees of the health center of Kerman province, (1997)" which was conducted by Tabatabai et al. in the health center of Kerman in 1997(28). This study was conducted in order to investigate the effect of the educational intervention based on the theory of planned behavior on the physical activity of the employees of the health center of Kerman province.

This semi-experimental study was conducted before and after on 149 employees of the health center of Kerman province and city, who were divided into two groups, case and control. Utilizing a researcher-made questionnaire, the constructs of this theory were measured before and after the intervention. The educational interventions in the case group were

implemented based on the interventions based on this theory for 6 weeks, and only lectures were used in the control group. Then two groups were evaluated.

The demographic characteristics did not show any significant differences between the two groups. The average scores of the various theories' constructs in the two groups were not significantly different prior to the intervention ( $p > 0.05$ ). Also, there was no significant difference between the case and control groups in the mean difference of scores of theoretical constructs before and after the intervention.

#### **Review of foreign texts:**

A study titled "Theory of Planned Behavior, Self-Care Motivation, and Self-Care in Hypertension" by Rosalind. M. et al. was conducted at the State University of Nursing in Detroit, Michigan, USA, in 2010 (29). In this research, 306 African Americans between the ages of 21 and 65 were examined. The selected sample comprised 161 females (53%) and 145 males (47%), who had a normal distribution in terms of education, and in terms of occupation, 48% (148 people) were full-time and 14% (44 people) worked part-time and 20% had permanent and temporary jobs. Their income levels were between 10,000 dollars and less than 40,000 dollars per year. According to the medical history, 50% of the participants had a history of chronic diseases that were prone to cardiovascular diseases, 50% (153 people) had a known chronic disease, and 115 people had a history of high blood pressure, of which 98% were taking antihypertensive drugs. The data collection tool was a questionnaire that was prepared based on the attitudes and beliefs of African Americans effective in blood pressure control behaviors, through which data was collected that reflected the three key concepts of the theory of planned behavior. Estimating the scales' reliability and looking at their correlations were the main goals of the preliminary analyses. Three items with single and negative correlations were eliminated from the indirect measure of perceived behavioral control using item-total correlations. The measurement scale for the TPB concepts did not alter. The indirect and direct measures of every TPB concept exhibit robust, affirmative, and noteworthy inverse correlations, indicating the applicability of the scales to the assessments of these concepts. As may be predicted, the TPB scale averages were rather high, indicating that participants felt positive about the goal of maintaining normal blood pressure limits. Participants also stated that they performed exceptionally well on several behaviors necessary for blood pressure regulation.

Mok et al. conducted a cross-sectional study titled "A case study of predicting physical activity of adolescents in Hong Kong based on the theory of planned behavior" in 2013 in Hong Kong (30). Ajzen's theory of planned behavior (TPB) and previous physical activity behavior were used in this study

to predict the degree of intention and physical behavior of secondary school students in Hong Kong. In this study, 486 pupils between the ages of 11 and 18 were enrolled, 250 of them were men and 236 were women. Using a self-care questionnaire, demographic data, past physical activity, and variables of the theory of planned behavior such as attitude, mental norm, and perceived behavioral control were measured. About 75% of students did not recommend the amount of physical activity by the government. Male behavioral intention was significantly higher than females. The theory of planned behavior variables, including subjective norms and perceived behavioral control (PBC), increased physical activity intention from 53.1% to 56.2% by adding past physical activity behavior. When predicting physical activity behavior, the theory of planned behavior accounted for 26.6% of the variance. Prediction is further improved by adding past physical activity behavior.

Williams et al. carried out a second study in 2015 with the title "Effects of a brief intervention to promote walking with a cluster randomized controlled trial based on the constructs of the theory of planned behavior". This study was conducted with a cluster randomized clinical trial with 315 general patients (31). Nurses and health care assistants performed the intervention of self-regulation or providing information (control). Questionnaires examined TPB variables at the beginning, after the intervention, 6 weeks, and 6 months. Walking was measured by a pedometer. At every follow-up period, the control group's reports were noticeably higher than average. The two groups did not significantly differ in terms of PBC, intention, attitude, or walking style. After controlling for samples, TPB factors strongly predicted the intention to go more but not walking behavior.

Another study titled "Implementation of an education campaign in a community using media distribution among sedentary elderly to encourage walking" was conducted by Reger et al. in 2002 (32).

The Wheeling marches drew 31,420 walkers among adults ages 50 to 65 in the West Virginia city. Through targeted media, public relations, and public health initiatives, this quasi-experimental communication intervention changed behavior by encouraging 30 minutes of daily walking using the theory of planned behavior and conventional model constructs. Walking observations in ten community locations and telephone surveys with 719 adults in the intervention community and 753 adults in the comparison community before and after the intervention were used to assess its impact. Behavioral observations show a 23% increase in the number of walks in the intervention community and no change in the comparison community (OR = 1.31, 95% CI = 1.14-1.50). In the intervention population (32.2) the stable population reported meeting the key CDC/ACSM/Surgeon General

recommendations for moderate-vigorous physical activity with at least 30 minutes of walking at least five times per week compared to 18% in the comparison population (OR=2.12, 95% CI = 2.24 - 1.41) and in the intervention community, the increase in the stage of change was significant. (p<0.0001)

#### 4. Research method

This study is intervention research of the type (field trial) with a control group, which was done to evaluate the effectiveness of training according to the theory of scheduled behavior on the self-care intention of health ambassadors in the implementation of the national self-care program in comprehensive rural health service centers of Mashhad Health Center No. 1.

#### **The studied community:**

The target population of this research is all the people who have registered and filled out the form as health ambassadors in comprehensive rural health service centers of Mashhad Health Center No. 1.

#### **Research environment:**

Health houses were the number one health center in Mashhad, and in this study, two health houses were randomly selected from all the health houses.

#### **Research sample:**

The research sample is 94 people and each member of the research sample in this research is a health ambassador who has the following criteria:

#### **Entry criteria:**

- The studied people have completed the health ambassador form in one of the comprehensive rural health service centers.
- Informed consent
- Not having a disability or confirmed physical disability, including movement, hearing, vision, etc.
- Not having a confirmed disability or mental disability
- Be over 16 years old
- He has not participated in the self-care training classes of health ambassadors

#### **Exit criteria:**

- Unwillingness to cooperate
- Absence of more than two sessions during training

#### **sample size and its calculation method:**

Based on background studies and extensive reviews from different sources, the most similar study was used among foreign and domestic researches. In this study and based on the sample size formula (sampling formula comparing the average in two trial groups), taking into account the confidence

coefficient of 0.95, the power of the test is 0.80, and also according to a similar study (33), the maximum sample size was determined by the following method It can be seen that considering the probability of dropout and in order to increase the statistical accuracy, 10% for each of the intervention and control groups was considered an increase in the study.

Sample size and its calculation method

The sample size for the above study will be as follows

0.05:  $\alpha$

0.20:  $\beta$

0.80:  $1 - \beta$

$$n = \frac{(z_{1-\alpha/2} + z_{1-\beta})^2 [(S_1^2 + S_2^2)]}{(\mu_1 - \mu_2)^2}$$

$s_1$  - standard deviation of the studied variable in the first group (exposed word or intervention)

$s_2$  - standard deviation of the studied variable in the second group (control or exposed or comparison)

$\mu_1$  average of the studied variable in the first group

The average of the studied variable in the second group

The effect of training based on the theory of planned behavior on aggression prevention behaviors (33)

The average effect of education in the control group according to the selected similar study:  $1\mu = 13.79$

The average standard deviation in the control group according to the selected similar study:  $sd = 1.4$

The average effect of education in the test group according to the selected similar study:  $2\mu = 15.9$

The average standard deviation in the test group according to the selected similar study:  $sd_2 = 3.4$

The sample size obtained by considering a 10% increase for the possibility of withdrawal during the implementation of the plan is 52 people.

**Sampling methods:**

Having the list of all the health centers of Mashhad Health Center No. 1 and considering the randomly estimated sample size, 2 health centers were randomly selected from among all the health centers and each of the randomly selected health centers was selected as training and control. From the list of health ambassadors of each health center, 52 health ambassadors who were randomly selected were selected as the training group and the control group.

**Table 1.** Educational activities and schedule of educational sessions

instructor, educator	end time	start time	Date	Issue	Session number
research fellow	13	11	04/02/2017	Cardiovascular stroke risk assessment	First
research fellow	13	11	04/04/2017	Prevention and control of high blood pressure and high blood fat	Second
research fellow	13	11	04/05/2017	Prevention of obesity and overweight and prevention of inactivity	Third
research fellow	13	11	04/07/2017	Prevention and control of diabetes	Fourth
research fellow	13	11	04/09/2017	Healthy diet	the fifth
research fellow	13	11	11/04/2017	Prevention and control of smoking and tobacco use	the sixth

Due to the implementation limitations of the plan and the lack of time due to the life schedule and work problems of the health ambassadors, the training program was held in 6 sessions of one hour and 45 minutes for the test group by lecture and question and answer method.

**Headings of educational content:**

- Cardiovascular stroke risk assessment
- Prevention and control of high blood pressure
- Prevention and control of high blood lipids
- Prevention of obesity and overweight
- Prevention and control of diabetes
- Healthy diet
- Prevention of inactivity

Prevention and control of smoking and tobacco use

c) The third stage: the post-intervention stage

After completing the training program, a waiting period of 3 months was considered. After the waiting period for follow-up, the same initial questionnaire was repeated for both groups (an intervention group and a control group). The pre-test and post-test results were analyzed using SPSS version 24 software and statistical tests, and the final report was prepared and presented.

Evaluation of the intervention:

Evaluation is one of the most basic parts of an educational program, and by conducting a timely evaluation, one can find out the success rate in achieving educational goals and help in determining the effects and results, strengths and weaknesses of the program, as well as checking the process used for the

desired changes. In this study, health ambassadors were assessed using a questionnaire three times before the intervention, just after the intervention ended, and three

months after the intervention ended in order to gauge the success of the training program.

### Findings

**Table 1-4:** Examination of age in two control and intervention groups

The result of the Mann-Whitney test	Mean ± standard deviation		Mean ± standard deviation
	experimental	experimental	
Z = 1/41	Age 68.30±19.6	68.30±19.6	Age

In the control group, 82% were married and in the experimental group, 100% were married. According to the result of Fisher's

test, the marital status was not homogeneous in both control and experimental groups (P-value = 0.003) (Table 4-2).

**Table 4-2:** Examination of marital status in two control and intervention groups

The result of Fisher's test	)percentage) number		Variable	
	Experimental	Experimental control		
X <sup>2</sup> =9/89	0(0/00)	9(18/00)	Single	marital status
	50(100/00)	41(82/00)	married	

In the control group, 72% possessed a diploma education and in the experimental group, 100% had a diploma education. Based on the chi-square test, education was not homogeneous

in the control and experimental groups (P-value<0.001) (Table 4-3).

**Table 4-3:** Examination of education in two control and intervention groups

Chi-square test result	)percentage) number		Variable	
	experimental	Control		
X <sup>2</sup> =16/27 P-value<0/001	50(100/00)	36(72/00)	Diploma-sub-diploma	education
	0 (0/00)	14(28/00)	Higher than diploma	

In the control group, 94% were housewives and in the experimental group, 96% were housewives. According to the

result of Fisher's test, the job was homogeneous in both control and experimental groups (P-value>0.99) (Table 4-4).

**Table 4-4:** Examination of jobs in two control and intervention groups

The result of Fisher's test	)percentage) number		Variable	
	Experimental	control		
X <sup>2</sup> =0/21 P-value>0/99	48(96/00)	47(94/00)	housewife	Job
	2 (4/00)	3(6/00)	other	

In the control group, 70% and in the experimental group, 60% had patients at home. Based on the chi-square test, the presence

of a sick person in the family was homogeneous in the control and experimental groups (P-value = 0.29) (Table 4-5).

**Table 4-5:** Examination of the sick person in the family in two control and intervention groups

Chi-square test result	percentage) number		Variable	
	Experimental	control		
X <sup>2</sup> =1/09 P-value=0/29	30(60/00)	35(70/00)	Yes	A sick person in the family
	20 (40/00)	15(30/00)	no	

In the control group, 82% and in the experimental group, 92% of the people who entered the study had no disease. According to the result of the chi-square test, the person's illness was

homogeneous in both control and experimental groups (P-value = 0.13) (Table 4-6).

**Table 4-6:** Examining whether the person is sick in the family in two control and intervention groups

Chi-square test result	percentage number		Variable	
	Experimental	control		
$X^2=2/21$ $P\text{-value}=0/13$	4(8/00)	9(18/00)	Yes	The person's illness
	46 (92/00)	41(82/00)	no	

In the control group, 60% and in the experimental group, 76% were health contacts. According to the chi-square test, the

health interface was homogeneous in the control and experimental groups (P-value = 0.08) (Table 4-7).

**Table 4-7:** Examining the health relationship in the family in two control and intervention groups

Chi-square test result	percentage number		Variable	
	Experimental	control		
$X^2=2/94$ $P\text{-value}=0/08$	38(76/00)	30(60/00)	Yes	Health interface
	12 (24/00)	20(40/00)	no	

**Table 4-10:** Investigation of behavioral belief before the intervention, immediately after the intervention, and three months after the intervention

The result of the Mann-Whitney test	control group		Experimental group		Behavioral belief
	Mean $\pm$ standard deviation	)interquartile range) median	Mean $\pm$ standard deviation	)interquartile range) median	
$z=0/38$ $P\text{-value}=0/7$	30/64 $\pm$ 6/06	28(10)	30/52 $\pm$ 6/64	28(13)	Before intervention
$Z=8/54$ $P\text{-value}<0/001$	29/92 $\pm$ 6/14	27(9)	47/16 $\pm$ 2/96	48(5)	Immediately after the intervention
$Z=8/6$ $P\text{-value}<0/001$	29/58 $\pm$ 5/65	27(7)	47/16 $\pm$ 2/62	48(4)	Three months after the intervention
$Z=8/64$ $P\text{-value}<0/001$	-0/72 $\pm$ 1/59	0(3)	16/64 $\pm$ 7	19(14)	Changes immediately after before the intervention
$Z=8/15$ $P\text{-value}<0/001$	-1/06 $\pm$ 1/54	-1(2)	16/64 $\pm$ 8/29	20(13)	Changes after three months before the intervention
	Chi-square=13/37 P-value=0/001		Chi-square=62/28 P-value<0/001		Friedman

Analysis of variance was used to control intervening variables and educational and marital variables were controlled, the adjusted results of which are shown in Table 4-11.

**Table 4-11:** The results of variance analysis with repeated data on the effect of training on behavioral beliefs

Test result	The standard error	The regression coefficient	intervention	Behavioral belief
t=19.95	0.83	72/16	Control	

P-value<0.001	-	0	intervention	Immediately after the intervention
t=19.54	0.87	14/17	Control	Three months after the intervention Behavioral belief
	-	0	intervention	

The results showed that by controlling the behavioral belief variable before the intervention (P-value>0.001) and the intervening variables of education (P-value=0.95) and marriage (P-value=0.03), the behavioral belief score of the intervention group Immediately after the intervention, there was an average increase of 16.72 units in comparison to the control group, and this difference is statistically significant (P-value < 0.001). Also, the results showed that three months after the intervention by controlling the variables, behavioral belief before the intervention (P-value>0.001), education (P-value=0.74), and marriage (P-value=0.03) Three months after the intervention, the behavioral belief score in the intervention group has increased by 19.52 units compared to the control group, and this difference is statistically significant (P-value < 0.001).

Table 4-12 shows how the experimental group's mean and standard deviation of the outcome evaluation changed before and right after the intervention (9.32±2.32), while the control group's mean and standard deviation were 1.06±2.19.). The

experimental group exhibited considerably greater changes in outcome evaluation before and immediately after the intervention compared to the control group (P-value < 0.001). The experimental group's mean and standard deviation of the outcome evaluation changed before and three months after the intervention to 8.68±2.63, whereas the control group's were 1.06±2.32. The experimental group exhibited considerably greater changes in outcome evaluation before and three months after the intervention compared to the control group (P-value < 0.001). The experimental group's mean outcome evaluation increased more in the first three months following the intervention than in the control group, suggesting that the intervention had a beneficial impact. In the experimental group (P-value < 0.001) and control group (P-value = 0.002), the Friedman test findings demonstrate that the average evaluation of the result three months following the intervention, or shortly after the intervention, and before the intervention There is a noticeable distinction.

**Table 4-12:** evaluation of the outcome before the intervention, immediately after the intervention, and three months after the intervention

The result of the Mann-Whitney test	control group		Experimental group		Outcome evaluation
	Mean ± standard deviation	)interquartile range) median	Mean ± standard deviation	)interquartile range) median	
<b>Z=1/27 P-value=0/27</b>	15/2±2/32	14(4)	14/14±1/64	14(3)	Before intervention
<b>Z=8/33 P-value&lt;0/001</b>	16/18±3/09	16(4)	23/76±1/76	25(2)	Immediately after the intervention
<b>Z=8/28 P-value&lt;0/001</b>	16/18±3/07	17(4)	23/12±1/64	23(3)	Three months after the intervention
<b>Z=8/51 P-value&lt;0/001</b>	1/06±2/19	0(2)	9/32±2/32	9 (3)	Changes immediately after before the intervention
<b>Z=8/38 P-value&lt;0/001</b>	1/06±2/32	0/5(2)	8/68±2/63	9(4)	Changes after three months before the intervention
	Chi-square=12/01 P-value=0/002		Chi-square=80/85 P-value<0/001		

## Discussion

Non-communicable diseases account for more than seventy-six percent of Iran's overall disease burden. The identification of primary risk factors and the prevention and control of these factors form the foundation for the prevention of non-communicable illnesses. Risk factors such as inactivity, environmental pollutants, smoking, alcohol, unhealthy diet, high blood pressure, diabetes, etc. are among the things that can be controlled promptly and have a great effect on maintaining people's health (36). Self-care lowers medical expenses, enhances patient happiness, justifies the use of services, and advances health and the state of life. There is substantial evidence that encouraging self-care as a people-based health strategy can lead to financial savings. These savings reduce the cost of basic and specialized care, as well as scheduled and unscheduled patient admissions and outpatient admissions (37).

The current study is interventional research of the type (field trial) with a control group, which aims to evaluate the effectiveness of training according to the theory of planned behavior on the self-care of health ambassadors in the application of the national self-care program in the risk factors of cardiovascular diseases in comprehensive rural health service centers, health center no. A Mashhad was done.

Comparison of the average score of the attitude towards self-care of cardiovascular disease risk factors in the training group and the control group before and after the training (intervention) In total, The experimental group's mean and standard deviation of changes before, immediately after, and three months after the intervention were higher than those of the control group, according to the evaluation results of the mean attitude scores in this study ( $P$ -value  $< 0.001$ ).

The experimental group's average attitude increased more than the control group's, demonstrating the intervention's beneficial effects.

The results obtained in terms of the effectiveness of education in improving attitudes in the present study, with the study of Jafar Pour et al. (38); which was done at Ahvaz University in 2015, it is consistent. Jafar Pour studied physical activity in women liaisons, which is very similar to self-care in women ambassadors of health. Increasing the attitude of physical activity as a self-care program has a direct effect on reducing cardiovascular diseases. Also, Selahi et al. (39) have stated in their study that the increase in attitude alone cannot be a sign of the effectiveness of the educational program in dealing with physical activities. In our study, the increase in attitude towards self-care alone cannot be a sign of the increase in self-care of health ambassadors because many Environmental stressors

must be reduced in order to fully realize that reducing stressors is very difficult.

The current study found that following the intervention, the test group's mean attitude structure towards the behavior increased as a result of the educational program based on the theory of planned behavior. Positive perceptions about the behavior's outcomes are reinforced after engaging in the behavior firsthand, which influences the behavior's continuation as a motivator. Because of this, after engaging in action firsthand, one's positive perceptions regarding its outcomes are reinforced, which in turn serves as motivation for continuing the behavior.

Peyman et al.'s study (24) showed that after the educational intervention, no significant change was observed in the structure of low-value snack consumption in middle schools; which is not consistent with the results of our study, perhaps it is due to the fact that most students have a positive attitude towards food items such as chocolates and puffs, and changing their attitude is a relatively difficult task, also in the study of Mok et al. (30). Regarding the physical activity of Hong Kong students, there was no significant difference between the attitude scores after the intervention in the two groups. One of the reasons for this study not matching with our study could be the difference in average age and cultural and social factors.

In the study of Amini et al. (26). The attitude score of the female employees of the University of Medical Sciences did not find a significant difference after the educational intervention, which may be due to the difference in the attitude score of this study with our study, differences in lifestyle, social, economic and cultural status, errors in reporting, different number of research units and Also, the cross-sectional nature of the studies.

Comparison of the average score of the subjective norm regarding self-care of the risk factors of cardiovascular diseases, in the training group and the control group before and after the training (intervention)

Overall, the assessment outcomes of the subjective norm mean scores in this study demonstrated that the experimental group's mean and standard deviation of the changes prior to, during, and three months following the intervention were larger than those of the control group ( $P$ -value  $< 0.001$ ).

The higher increase in the average mental norm in the experimental group indicates the positive effect of the intervention.

In the research of Mohammadi Zaidi et al.(40), training based on mental norms has been able to create a supportive social network in the workplace, the test group, and lead to the improvement of the safety climate. Mohammadi conducted the

study on a group of workers who were similar to our society in terms of economy and culture. Also, Peyman et al.'s study (24). They examined mental norms in the two areas of parents and friends and stated that family and peers have a crucial role in people's behavior, and in our study, spouses, parents, and friends of health ambassadors played an important role in increasing their mental norms.

This alignment shows that the educational intervention has increased the average score of the subjective norm of people, followed by a change in self-care behavior, and ultimately improved health. Perhaps the use of educational methods such as panel discussions or conducting training sessions for family members of health ambassadors has been able to have a positive effect on this structure.

in f Melabi et al. research (22). no statistically significant exist difference regarding the mental norm between the pre-intervention and post-intervention stages in the test group. Perhaps the reason for the discrepancy between the mental norm of this study and our study is the cultural issues governing the society that influential people such as parents and children cannot easily do breast self-examination influential

In Jafar Pour et al.'s study (38). Contrary to the findings of our study, there was no discernible change in the subjective norm score of female liaisons about sports activities across each group at time points. The absence of guidance from parents and spouses on sports activities and societal cultural restrictions on women's sports could be the root of this issue.

Comparison of the average score of perceived behavioral control in relation to self-care of the risk factors of cardiovascular diseases, in the training group and the control group before and after the training (intervention)

The study's findings demonstrated that the self-care training program might positively impact the health ambassadors' perception of their control over the risk factors for cardiovascular illnesses, that is, the health ambassadors of the intervention groups came to believe that they can eliminate the facilitating factors and obstacles Identify and control the self-care behavior of the risk factors of cardiovascular diseases.

Overall, the assessment findings of the mean perceived behavioral control scores in this study demonstrated that the experimental group's mean and standard deviation of changes prior to, during, and three months following the intervention were larger than those of the control group (P-value < 0.001).

The greater surge in the average professed behavioral control in the experimental group has shown the positive effect of the intervention.

The results obtained in this study, with the study of Parrott et al. (41) published in 2008 with the title "Effects of an email-based intervention on physical activity based on the theory of planned behavior: " and the study of Reger et al. (32) with the

title Wheeling Walking: Implementation A community-based education campaign using media distribution among sedentary older adults to encourage walking was similar in 2002, as well as in the study by Ramzan Khani et al. (24). The control belief score of the two groups had a significant difference after the educational intervention. In this study, the children gained a correct understanding of the obstacles and facilities for crossing the street, including the ability to use the aerial bridge, cross the pedestrian crossing, understand the dangers of accident injuries, and the traffic rules for crossing the street after the intervention. The findings of our research also showed that the self-care training program has been able to have a positive effect on the perceived control of health ambassadors in the field of self-care of the risk factors of cardiovascular diseases, which means that the health ambassadors of the intervention groups have come to believe that the power and ability to identify the risk factors of cardiovascular diseases Have cardiovascular and control them. The alignment of these studies with the current study shows that the educational intervention has caused a change in the perceived behavioral control of people, followed by a change in the components of self-care and ultimately health promotion. The results of this study with the results of the study of Williams et al. (42). which, using the concepts of the theory of planned behavior and the research by White et al., examined the effects of a brief intervention to encourage walking in a cluster randomized controlled study in 2015. The results of type 2 diabetes and cardiovascular disorders are contradictory. The differences in the individual, cultural, social, and economic aspects of the investigated society, as well as the utilization of different instruments, can be cited as some of the reasons for the discrepancy between these studies and the current one.

Comparison of the average score of the intention to perform self-care behavior of cardiovascular disease risk factors in the training group and the control group before and after the training (intervention)

The mean and standard deviation of changes in the intention to carry out the behavior prior were demonstrated by the evaluation results of the average scores of intention in this study, immediately and three months after the intervention in the experimental group were higher than the control group (P-value < 0.001).

In total, the results of this research regarding behavioral intention showed that the intention of health ambassadors regarding self-care of cardiovascular disease risk factors increased significantly after the intervention.

## **Conclusion:**

The study's overall findings demonstrated that health ambassadors' attitudes, mental norms, perceived behavioral

control, and behavioral intention can all be significantly improved by designing and implementing training programs. Additionally, learning about self-care and cardiovascular disease risk factors can significantly lower the likelihood of developing cardiovascular diseases. This study was conducted in a small sample of rural health ambassadors, but as it can be seen from the results of the study, although cardiovascular diseases are very common and many people are affected by these diseases every year and the cases of death due to these diseases are also high and Care is very important in the prevention of cardiovascular diseases, but the self-care status of the studied health ambassadors was not at an optimal level, which doubles the need to implement educational intermediations in the field of identifying risk factors and self-care in the prevention of cardiovascular diseases. In total, the results of the present study indicate that the training program consisting of 6 training sessions of 45 minutes in one month has been able to increase the average score of the intention to take care of the risk factors of cardiovascular diseases.

4-5 suggestions:

Based on the findings of the study:

In this study, self-care training on the risk factors of cardiovascular diseases has been carried out in health ambassadors, and since the way of life in most urban and rural areas is currently by promoting ready-made foods and not following the proper eating pattern and being sedentary, in the long run, this Self-care will be decreasing, so it is suggested that the training program be followed up or repeated annually in people, or future researches, the duration of follow-up and training should be predicted more, and even up to one year of follow-up is suggested by the next researchers.

Based on the findings of the research, the behavior of family members and other influential people in self-care is considered to be the most important effective option in the mental norm of health ambassadors, and based on the findings of this research, the evaluation score of the mental norm decreased the most in the immediate period and three months later (about 4 scores) it is better to carry out these trainings for other sections of the society at the same time so that effective people (spouses, parents, teachers, etc.) with awareness and sensitivity towards self-care of the risk factors of cardiovascular diseases, have a positive effect on the norms have the mentality, intentions, and behaviors of health ambassadors.

Considering the effectiveness of education on the intention of self-care for the risk factors of cardiovascular diseases, it is suggested to implement an educational program from childhood by including the necessary educational materials, according to the age and understanding of the students, to be planned and implemented in the textbooks, so that the institution Creating a culture of self-care at older ages to

prevent the occurrence of cardiovascular diseases in the society.

Due to the fact that many health ambassadors are students, it is suggested that the educational program of childhood self-care should be included in the textbooks according to the age and understanding of the students.

#### **suggestions for further research**

- Examining the influence of self-care exercise on the risk factors of cardiovascular diseases in other groups, especially teenagers and young adults.
- Investigating the effect of self-care training in other cases of the national self-care program in health ambassadors
- The survey revealed a noteworthy distinction in the literacy levels of the two groups. It is suggested that in the next studies, a study should be conducted on the relationship between the level of literacy and self-care.
- In the current study, there was a substantial difference in marital status in the 2 groups, it is suggested that a study be conducted in the field of marital relationship and self-care in future studies.

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**Authors' contribution:**

1. Conceptualization and study design, data collection, data analysis and interpretation: Hossein Amani, Mohammad Sadeq Mahjoubi, Faezeh Mahjoubi, Elham Saber
2. Preparing the draft of the article or revising it to develop thoughtful content: Mohammad Sadeq Mahjoubi, Faezeh Mahjoubi, Elham Saber, Hossein Amani
3. Final approval of the manuscript before sending to the journal: Hossein Amani, Mohammad Sadeq Mahjoubi, Faezeh Mahjoubi, Elham Saber

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