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# Self-care behavioral change among type 2 diabetic out-patients at Quang Ninh general Hospital after health education intervention in 2023

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## ABSTRACT

***Objective**: to describe the change in self-care behavior among the type 2 diabetic patients treated as outpatients at Quang Ninh Provincial General Hospital after health education intervention in 2023. **Participants and methods**: Health education intervention study on a group of 86 diabetic patients with comparison before - after intervention from March to September 2023. **Results**: The average number of days per week performing self-care behaviors among diabetic patients before the intervention was 3.5 ± 0.76, after the intervention, it increased to 4.36 ± 1.1 and continued increasing to 6, 04 ± 0.77 ($p < 0.001$) one month after the intervention. Before the intervention, 22.1% of the patients had good self-care behaviors, after the intervention, the rate increased to 60.5% and continued increasing to 96.5% one month after the intervention. Before the intervention, only 2.3% of the patients were able to take care of themselves, after intervention the rate increased to 10.5% and continued to increase to 90.7% one month after the intervention. **Conclusions**: Health education intervention program has significantly changed the self-care behavior of the type 2 diabetes patients. It is necessary to continue to maintain and supplement content and combine many forms of health education counseling for them.*

***Keywords:** Self-care behavior, diabetes.*

## INTRODUCTION

Type 2 diabetes is the most common, accounting for 90% of diabetic types. According to the statistics of the International Diabetes Federation (IDF), in 2019, there were an estimated 463 million people in the world (accounting for 9.3% of the population) with diabetes, and an estimated number of 578 million people by 2030 (10.8%). In Vietnam, the rate of people with diabetes is increasing rapidly. According to the 2015 survey results conducted by the Ministry of Health, there were 68.9% of people with undetected hyperglycemia [1].

According to the American Diabetes Association (ADA), solutions for blood sugar control in this group of patients are nutrition, physical activity, medication compliance and self-monitoring blood sugar of the patients, this therapy requires self-care activities [2]. However, previous studies on self-care activities in type 2 diabetic

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patients shown that patients' self-care activities are not high [3, 4]. As recommended by the ADA, a diabetes self-management education program is the process of informing, reinforcing, and empowering the diabetic to care for themselves [5]. Nurses need to provide a health education program to improve patients' self-care ability, thereby balancing their needs and self-care ability.

Currently, there are a number of studies conducted nursing interventions and indicated the effectiveness of improving diabetic patients' self-care ability [6, 7]. According to a report by Quang Ninh General Hospital, the hospital administers and provides outpatient treatment for nearly 1,800 diabetic patients every month and the number of people with diabetes are increasing rapidly [8]. The previous studies in Quang Ninh reported that age, gender, health status, socio-cultural factors, health care system, family factors, lifestyle, environmental factors are primary factors affecting the ability to self-care for diabetes [8], [9]. Therefore, it is necessary to conduct a study to assess the current state of self-care and develop an effective health education intervention program based on nursing theory on self-care behavior for type 2 diabetes people in Quang Ninh province. Therefore, the studywas conducted with 2 objectives of: describe the current state of self-care behavior of type 2 diabetic patients treated as outpatients at Quang Ninh General Hospital in 2023 and assess the change in self-care behavior among type 2 diabetic patients treated as outpatients at Quang Ninh General Hospital after education intervention in 2023.

## PARTICIPANTS AND METHODS

**Participants:** The participants were type 2 diabetic patients receiving outpatient treatment at Quang Ninh General Hospital.

**Inclusion criteria**: Patients aged from 18 years old, diagnosed with type 2 diabetes for more than 6 months. Have the ability to communicate, able to receive and answer questions, do not suffer from serious diseases.

**Exclusion criteria:** The patient is unable to take care of himself. The patient participated in a health education program about other diabetes mellitus.

**Time and setting:** The research was conducted at the Department of Examination, Quang Ninh General Hospital from March 2023 to September 2023.

**Research design:** A pre- and post-intervention study was conducted.

### Sample and sample selection method

The formula was applied to calculate the sample size:

In which:

$$n = Z^2_{(\alpha,\beta)} \frac{p_0(1-p_0) + p_1(1-p_1)}{(p_0 - p_1)^2}$$

n: the number of type 2 diabetic patients participating in the study.

The level of statistical significance was 95% ($\alpha = 0.05$), at 90% power ($\beta = 0.1$), equivalent to $Z^2_{(\alpha, \beta)} = 10.5$.

$p_0$: the percentage of type 2 diabetic patients performed self-care behavior well before intervention.

$p_1$: the percentage of type 2 diabetic patients did self-care behavior after intervention.

According to research by Nguyen Thi Kieu My (2017): The percentage of patients who performed well in type 2 diabetes mellitus was 32.4% [4].

It was estimated that after intervention, the percentage of patients performing well

on the self-care behavior increased to 25%, with $p_0$ = 32.4%. consequently $p_1$= 57.4%.

Substituting into the above formula with n = 78 and the expected 10% of the patients dropping out during the study, the minimum sample size was n = 86.

**Sampling method:** The convenient sampling method was employed to choose all patients who were diagnosed with type 2 diabetes and received outpatient treatment at the Department of Examination - Quang Ninh General Hospital from April 2023 to June 2023 met the sampling criteria until the sample size was sufficient.

### Research measurement

#### *Data collection measurement*

The questionnaire used in this study was divided into 3 parts:

Part 1: General information about research participants: Age, gender, education level, marital status.

Part 2: The questionnaire to evaluate self-care activities among diabetic patients (Summary of Diabetes Self-care Activities – SDSCA), included 17 items [4, 10]: about diet, exercise, blood sugar testing, foot care, and medication compliance for the diabetic patients. Each question has 8 options for frequency of performing self-care behavior in a week from 0 - 7 days, corresponding to a score of 0 - 7 points. The average of days to complete all contents is equal to the total number of days to perform the contents divided by the total number of questions. The people who performed self-care behavior 5 days or more was considered regularly performed and had good self-care behavior, those who do it for 4 days or less were considered to have poor self-care activities [6].

Part 3: Questionnaire to assess the self-care ability of diabetic patients (DASAS-R): consisted of 15 items according to Likert 5: 1 (Completely disagree) to 5 (Completely agree). The scores on the DASAS-R scale ranged from 15 to 75 with higher scores indicating better self-care ability [4]. The type 2 diabetic patients were evaluated on their self-care behavior at two levels: satisfactory and unsatisfactory. Specifically, the patient's self-care ability was good when they achieved at least 80% of the total score of the questionnaire, satisfactory when the total score was ≥ 60, and unsatisfactory when it < 60 [3].

**Health education intervention:** In the study, a supportive educational nursing program was used, including group education and individual support. Part 1 was the introduction of diabetes and its complications, diet, exercise, medication use and disease self-monitoring, 5 videos on knowledge and self-care skills for diabetic patients issued by the Ministry of Health. Part 2 was telephone conversations between the researcher and the patients.

### The method of data collection

Data was collected as following steps:

- Step 1: Made a list and selected patients who met the sampling criteria.

- Step 2: Approached the patient when the patient submitted the medical examination book and was waiting for examination, explained the purpose and meaning of the research.

- Step 3: Assessed the patient's self-care behavior before health education intervention (time T1) using a pre-designed survey questionnaire. Interview time is about 10 minutes.

- Step 4: Conducted direct health education in small groups on caring behaviors for the diabetic patients. A health education session lasted about 30 to 40 minutes while the patients were waiting for their test results.

- Step 5: Re-assessed the patients' self-care behavior immediately after health education intervention (Time T2), using the same questionnaire to assess self-care behavior before intervention. After the patients finished the questionnaire, advised on the knowledge that the patient answered incorrectly; Answered questions to ensure patients understood correctly before going home. Thanked them and made an appointment for re-assess after 1 month when they came back for a follow-up examination.

- Step 6: Re-assessed the diabetic patients' self-care behavior after 1 month (time T3), using the questionnaire of time T1 while the patients were waiting for examination. Carry out additional education on unsatisfactory knowledge and practice content (if any) while patients were waiting for their examination results.

**Data analysis methods:** The cleaned data were entered in SPSS 20.0 software. Statistical tests such as percentage value, mean, SD, and t-test were used to analyze the data.

**Ethics of research:** The study was approved by the Scientific Committee and Ethics Committee of Nam Dinh University of Nursing under the Certificate No.: 944/GCN-HDĐ dated April 21, 2023; got the permission of Quang Ninh General Hospital and consent of the participants. The information obtained was kept confidential and for research purposes only.

## RESULTS

**Table 1. Demographic characteristics of the participants**

| Content | | Number (n) | Percentage (%) |
|---|---|---|---|
| Gender | Male | 44 | 51.2 |
| | Female | 42 | 48.8 |
| Education level | Primary and secondary school | 6 | 7.0 |
| | High school | 21 | 24.4 |
| | Vocational high school and college | 37 | 43 |
| | Undergraduate and post-graduate | 22 | 25.6 |
| Marital status | Married | 82 | 95.3 |
| | Divorced/ legally separated | 4 | 4.7 |
| Mean age (Mean ± SD) | | 63.22 ± 9.38 (min: 37; max: 86) | |

Among the 86 research participants, the percentage of men was 51.2%, and the percentage of women was 48.8%. The education level at vocational secondary schools and colleges accounted for the highest percentage of 43%. Most of the patients were married (95.3%). The average age was 63 years old, with the youngest of 37 years old and the oldest of 86 years old.

**Table 2. Change in the average number of days performing diabetes self-care behaviors by intervention groups before and after intervention**

| | Evaluation time | | | p |
|---|---|---|---|---|
| | Before intervention (T1) | After intervention (T2) | 1 month after intervention (T3) | |
| | Mean ± SD | Mean ± SD | Mean ± SD | |
| Diet | 3.08 ± 0.8 | 4.03 ± 1.28 | 5.46 ± 1.26 | $P_{2-1}$ = 0.000<br>$P_{3-1}$ = 0.000 |
| Exercise regimen | 3.19 ± 1 | 4.0 ± 1.29 | 6.0 ± 1.08 | $P_{2-1}$ = 0.000<br>$P_{3-1}$ = 0.000 |
| Blood sugar test | 4.08 ± 1.54 | 4.71 ± 1.56 | 6.54 ± 0.75 | $P_{2-1}$ = 0.000<br>$P_{3-1}$ = 0.000 |
| Foot care | 3.14 ± 1.13 | 4.16 ± 1.46 | 6.25 ± 1 | $P_{2-1}$ = 0.000<br>$P_{3-1}$ = 0.000 |
| Medication compliance | 6.66 ± 0.6 | 6.98 ± 0.15 | 7.0 ± 0 | $P_{2-1}$ = 0.000<br>$P_{3-1}$ = 0.000 |
| General self-care behaviors | 3.5 ± 0.76 | 4.36 ± 1.1 | 6.04 ± 0.77 | $P_{2-1}$ = 0.000<br>$P_{3-1}$ = 0.000 |

The average number of days performing general self-care behavior of diabetic patients before intervention was 3.5 ± 0.76, increased to 4.36 ± 1.1 after intervention and continued increasing to 6.04 ± 0.77 ($p < 0.001$) 1 month after intervention. Among them, medication compliance had the highest average number of days, and diet performance had the lowest. The content of self-care practices of diabetic patients before and after intervention changed significantly ($p < 0.001$).

**Table 3. Classification of diabetes self-care behaviors before and after intervention**

| | | Evaluation time | | |
|---|---|---|---|---|
| | | T1 n (%) | T2 n (%) | T3 n (%) |
| Perform diet | Good | 8 (9.3) | 43 (50) | 75 (87.2) |
| | Not good | 78 (90.7) | 43 (50) | 11 (12.8) |
| Perform an exercise regimen | Good | 14 (16.3) | 43 (50) | 79 (91.9) |
| | Not good | 72 (83.7) | 43 (50) | 7 (8.1) |
| Perform a blood sugar test | Good | 30 (34.9) | 54 (62.8) | 85 (98.8) |
| | Not good | 56(65.1) | 32 (37.2) | 1 (1,2) |

| | | Evaluation time | | |
|---|---|---|---|---|
| | | T1 n (%) | T2 n (%) | T3 n (%) |
| Perform foot care | Good | 13 (15.1) | 50 (58.1) | 80 (93) |
| | Not good | 73 (84.9) | 36 (41.9) | 6 (7)) |
| Perform medication compliance | Good | 85 (98.8) | 86 (100) | 86 (100) |
| | Not good | 1 (1,2) | 0 (0) | 0 (0) |
| General self-care behaviors | Good | 19 (22.1) | 52 (60.5) | 83 (96.5) |
| | Not good | 67 (77.9) | 34 (39.5) | 3 (3.5) |

Before intervention, 22.1% of the patients had good self-care behavior, the percentage increased to 60.5% after intervention and continued increasing to 96.5% one month after intervention. In which, well performing medication compliance had the highest rate with 98.8% before intervention, 100% after intervention and one month of intervention. Performing a good diet had the lowest percentage with 9.3% before intervention, 50% after intervention and 87.2% 1 month after intervention.

**Table 4. Mean score of self-care ability of people with diabetes**

| Content | Before intervention (T1) | After intervention (T2) | 1 month after intervention (T3) | p |
|---|---|---|---|---|
| Self-care ability | 2.72 ± 0.53 | 3.58 ± 0.41 | 4.53 ± 0.41 | $P_{2-1} = 0.000$<br>$P_{3-1} = 0.000$ |

The results in Table 4 indicated that the level of agreement about self-care ability of diabetic patients was 2.72 ± 0.53 before intervention, increased to 3.58 ± 0.41 after intervention and continued increasing to 4.53 ± 0.41 one month after intervention. The intervention effect was statistically significant with $p < 0.001$.

**Table 5. Classification of diabetes self-care ability before and after intervention**

| | Evaluation time | | |
|---|---|---|---|
| | T1 n (%) | T2 n (%) | T3 n (%) |
| Satisfactory | 2 (2,3) | 9 (10.5) | 78 (90.7) |
| Unsatisfactory | 84 (97.7) | 77 (89.5) | 8 (9.3) |

Before intervention, only 2.3% of the patients were able to take care of themselves, after intervention the rate increased to 10.5% and continued to increase to 90.7% one month after intervention.

## DISCUSSION

The study on health education intervention was conducted on 86 diabetic patients. Result From table 2 indicated that the average number of days performing general self-care behavior of diabetic patients before intervention was 3.5 ± 0.76. This result is similar to the one of the research by Nhu Thi Thu and Vu Bich Nga (2022) with an average score of diabetes self-management activities of 3.42 ± 1.13 [3]. Before intervention, 22.1% of the patients had good self-care behavior, this rate is lower than that of the research by Le Viet Hanh and Tran Thi Thanh Huong (2021) which reported that only 56.3% of patients practiced good self-care [11]. Research by Nguyen Thi Kieu My (2017) in some communes and wards of Thua Thien Hue province presented that the rate of good diabetes self-care behavior was 32.4% [4]. The rate of self-care behavior of the patients in the study was lower than other studies, possibly because of different questionnaires and different participants.

After the health education intervention, the average number of days performing diabetes self-care behavior increased to 4.36 ± 1.1 and continued increasing to 6.04 ± 0.77 ($p < 0.001$) one month after the intervention. The proportion of patients performing good self-care behavior increased to 60.5% after the intervention and continued increasing to 96.5% one month after the intervention. Therefore, the communication program of the study changed significantly the patients' diabetes self-care behavior. In the content about self-care behavior, performing a good diet had the lowest rate of 9.3%. The result is much lower than the one of the study by Nguyen Thi Kieu My (2017) with dietary compliance of 57.1% [4]. Research by Nhu Thi Thu and Vu Bich Nga (2022) reported that patients performed self-regulating their diet quite well (56.9%) [3]. The poor rate of implementing a good diet may be because Quang Ninh is a city with a developed economy, especially in tourism, and has many restaurant services, patients' compliance with a good diet is not good.

After the intervention, performing diet increased to 50% and continued increasing to 87.2% after one month. The average number of days on performing the diet was 3.08 ± 0.8, increased to 4.03 ± 1.28 after the intervention and continued increasing to 5.46 ± 1.26 one month after intervention ($p < 0.001$). The results are similar to the study by Nguyen Trong Nhan (2019) at Endocrinology Hospital in Bac Giang Province, which indicated that health education intervention significantly improved patients' dietary practices. Before the intervention, the mean score of dietary practice was 13.08 ± 2.40 points, out of a total of 26 points., right after the intervention, the mean score increased to 17.62 ± 2.98 points, one month after the intervention, it was 16.53 ± 2.18 points, the difference is statistically significant. statistics with $p < 0.0\ 5$ [12]. Therefore, although the two studies used different scales on dietary implementation and different health education and communication programs, they both demonstrated significant changes in dietary implementation.

According to Table 3, good medication compliance accounted for the highest rate of 98.8%. The result is higher than that of the research by Nguyen Thi Kieu My (2017) in some communes and wards in Thua Thien Hue province which reported that patients' medication compliance was 93.2% [4]. Research by Nguyen Thi Thao (2022) showed that the rate of patients who did not comply with medication was 57.2%[8].

Research by Nhu Thi Thu and Vu Bich Nga (2022) indicated that the percentage of the diabetic patients' medication compliance as prescription was 75% [3]. After the intervention, it increased to 100% and continued to maintain 100% after one month. Before the intervention, the mean score of patients taking medication as recommend was 6.66 ± 0.61, which increased to 6.98 ± 0.15 after the intervention and 7 ± 0 ($p < 0.001$) after one month with 100% patients' performance. Thus, it may be seen that diabetic patients are focusing on taking medicine to treat the disease rather than changing their daily lifestyle. The results demonstrated that the intervention program was most effective if all the participants were aware of and had the correct skills in medication treatment.

This is a pre-and-post- intervention study without a control group. Due to the limitation of time, funding, and human resources, the research has not been able to conduct many communication methods with a large number of patients. This is a limitation of the research. However, health education consultation for diabetic patients was conducted and some results indicating changes in patients' practices in self-care behavior were achieved. Consequently, more evidence about the effectiveness of intervention programs in diabetes treatment will be provided to hospitals.

## CONCLUSION

Health education intervention significantly changed the self-care behavior of diabetic patients, the average number of days per week performing general self-care behavior of diabetic patients increased from 3.5 to 4.36 and continued increasing to 6.04 days after one month, the difference was statistically significant ($p < 0.001$). Before the intervention, only 22.1% of the patients had good self-care behavior. After the intervention, this rate increased to 60.5% and continued increasing to 96.5% one month after intervention. Only 2.3% of the patients were able to take care of themselves before the intervention, however the rate increased to 10.5% and continued increasing to 90.7% one month after the intervention. Therefore, it is necessary to continue maintaining and supplementing the content and combine various kind of health education consultation for diabetic patients.

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