

## Effect of Stress Self-Management Intervention on Enhancing Stress level, Self-Efficacy, and Outcomes of Older Adults with Varying Chronic Diseases

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**Abstract: Background:** Stress produces several physical and mental symptoms, and the effects of stress differ depending on each individual's situational factors. **Purpose:** of this study was to examine the effect of stress self-management intervention on enhancing stress levels, self-efficacy, and outcomes of older adults with varying chronic diseases (diabetes and hypertension). **Design:** A quasi-experimental (study and control design) was utilized. **Settings:** - This study was conducted at a family health unit in Sahel El-Gawaber village, Menoufia Governorate, Egypt. **Sample:** This study included a purposive sample of 140 older adults in the above setting, Egypt. **Instruments:** three instruments were utilized as follow: instrument I: Interviewing questionnaire that included; the socio-demographic data of older adults, medical history, and bio-physiological measurement instrument which included random blood sugar and measurement of blood pressure. Instrument II: The Perceived Stress Scale was used to assess perceived stress in older adults. Instrument III: Self-Efficacy for Managing Chronic Disease Scale. **Results:** After the intervention, there was a significant decrease in stress among the study group than the control group. Also, the blood glucose level and blood pressure were controlled in the study group than control group. **Conclusions:** stress self-management intervention was effective in stress control among older adults in the study group compared to the control group. Also, it was successful in controlling blood glucose and blood pressure in the study group than control group. **Recommendations:** Enhance awareness of the community regarding stress management. The nurse should take a more active role in providing educational programs about stress management.

**Keywords:** *Chronic diseases - Older Adults - Self-Efficacy – Stress level - Stress management*

## **Introduction**

Due to longer life expectancies, the number of people over 65 has been growing during the past 10 years and will continue to rise for another 20 years. The percentage of adults over 85 will increase rapidly starting in 2030. By 2050, The number of adults over 80 will triple (World Population Ageing, 2015). The number of people 50 years of age and older who have at least one chronic illness is expected to rise by 99.5% from 71.522 million in 2020 to 142.66 million in 2050 (Ansah et al., 2022). The leading causes of death among non-communicable diseases, or chronic diseases, include diabetes, cancer, cardiovascular disorders, and chronic respiratory conditions (World Health Organization [WHO], 2021). According to estimates, NCDs cause 67% of premature deaths and 82% of all mortalities in Egypt (WHO, 2020). Planning for the "older-old age wave" should start now. Place preference, environmental processes, and aspects about one's health were found to be positively correlated with older adults' "social, mental, and physical" health (Lak et al., 2023).

The well-being of patients with chronic diseases has attracted worldwide awareness, due to the related heavy burden of chronicity (Beyoğlu & Avci, 2020). Compared to patients with non-chronic conditions, persons with diabetes or hypertension experienced higher levels of stress and anxiety. By using peer-led pain management, patients' self-efficacy may increase and their chronic pain may decrease (Tse et al., 2021).

The term "self-efficacy" describes a person's confidence or belief in their ability to meet their behavioral goals in terms of their physical and mental states (Noujaim et al., 2019). Studies reveal that among older people with long-term medical conditions, increased emotional support was associated with increased self-efficacy, reduced chronic pain, and improved patient self-efficacy (Zhu et al., 2022). Subjective well-being and social support have been influenced by a chain effect involving self-efficacy and perceived stress (Luo et al., 2023).

Stress occurs when the person fails to cope with pressure. So, several physiological and psychological symptoms of stress are produced, and they differ depending on each individual's situational factors (Fink, 2016). Stress may be considered a cause and a consequence of diabetes or hypertension. All stress is not considered bad. However persistent stress might result in health problems (Alonso-Morán et al., 2014).

Physical and mental stress raises blood pressure, and blood sugar level and increases heart rate as well, that considered the problem for people with diabetes (Lieberman et al., 2016). People with hypertension or diabetes who are regularly stressed are more likely to have poor blood pressure and blood glucose control because stress hormones such as cortisol increase blood pressure and blood sugar levels (Brannon et al., 2013).

Stress management, as it was the ancient saying 'prevention is better than cure' is surely true for stress

management. Long-term stress management or prevention can reduce the likelihood of developing various illnesses such as depression obesity, heart disease and hypertension. Frequent exercise is an effective stress-reduction strategy. Performing at least 20 minutes of exercise three times a week is efficient in decreasing stress (The Office of Disease Prevention and Health Promotion [OECD], 2024). In order to manage chronic diseases, one must monitor and address subjective well-being. The management requires full attention to self-management, including taking several prescribed medications for comorbidity (Hubbard et al., 2013). The nurse takes the vital role in helping older adults alleviate their feelings of stress by educating them. Research done by Maresova, et al., 2019 who investigated the effects of chronic illnesses and other old age-related restrictions, they demonstrated that psychological issues, mobility difficulties, and poor cognitive performance may be reduced with greater attention, such as education and training about ways to relieve stress which include practice regular exercise, going out and getting some fresh air, engaging in a light physical exercise as walking, breathing exercises, going on holiday, contact and communicate with a close friend (Moult et al., 2018). Also practicing yoga and mindfulness meditation involves paying attention to thoughts and feelings, time for relaxation, get restful sleep that helps to reduce the risk of related diseases (Crum et al., 2013).

### **Purpose of the study**

This study aimed to examine the effect of stress self-management intervention on enhancing stress levels, self-efficacy, and outcomes of older adults with varying chronic diseases (diabetes and hypertension).

### **Research Hypothesis**

- 1) Participants who receive stress self-management intervention will have lower stress than participants not receive stress self-management.
- 2) Participants who receive stress self-management intervention will have controlled blood pressure than participants not receive stress self-management.
- 3) Participants who receive stress self-management intervention will have controlled blood glucose levels than participants not receive stress self-management.
- 4) Participants who receive stress self-management intervention will have better self-efficacy than participants not receive stress self-management.

### **Methods**

#### **Research design:**

A quasi-experimental (pre-test–post-test, & study control design) was used

#### **Setting:**

The study was conducted at the Family Health Unit in Sahel El-Gawaber village which is considered the highest percentage of the population in El-Shohada district-Menoufia Governorate-Egypt.

**Sample:**

A Purposive sample of 140 older adults was divided randomly into two equally matched groups. Participants were divided randomly into study and control groups by using simple random selection.

**Inclusion criteria:**

- Participants 60 years old and older.
- Participants with chronic diseases (diabetes mellitus and/ or hypertension)

**Sample size calculation:**

To calculate the sample size to examine the impact of stress management intervention among older adults with chronic diseases. The sample size was calculated according to the following equation. Considering  $\alpha$  type I error of 0.05,  $\beta$  type II error of 0.20, a test power of 0.8,  $m = n_1$  =size of the sample from population 1, and  $d = 2$  as the least significant difference,  $z_1$ = standard normal deviate for the two-tailed test based on alpha level (relates to the confidence interval level),  $p$ = percent of unexposed (control) with the outcome (knowledge about exercise and stress management) (Diggle et al., 2013).

$$N = \frac{2(z_1 - \alpha + z_1 - \beta)^2 \sigma^2 \{1 + (m-1) p\}}{md^2}$$

Based on the sample size calculated, a total of 136 older adults who were approximately to 140 to guard against loss to follow up in the post-intervention (70 for each group), and agreed to participate, included in the study. Study group: compromised "70" older adults suffered from either diabetes or hypertension, or both

diabetes mellitus and hypertension, given the stress self-management intervention, and the control group "70" older adults suffered from either diabetes mellitus or hypertension, or both diabetes and hypertension who have the routine routs of knowledge as newspapers, reading books, internet, social media, etc.

**Sampling technique:**

The names of the participants wrote in papers those papers were put in a bowl and mix the papers then select the names of the participants (the study group included 70 participants and the control group included 70 participants).

**Instruments:**

**Instrument one: Interviewing questionnaire which contains:**

- **Part 1:** Socio-demographic data as sex, age, and level of education.
- **Part 2:** Medical history which includes type of disease, number and dose of medication used for diabetes mellitus and hypertension.
- **Part 3:** Bio physiological measurement instrument which will include:
  - Random blood sugar
  - Measurement of blood pressure

**Instrument two: Perceived Stress Scale:**

This scale was developed by (Cohen et al., 1983) to assess perceived stress in older adults. The scale was translated from English to Arabic language and reviewed by an English Arabic-speaker specialist.

The scoring system of the scale: This scale was composed of 10 questions each of them has five responses (never, almost never, sometimes, fairly often and very often) the response never taken zero scores, almost never taken 1 score, sometimes taken 2 scores, fairly often taken 3 scores, very often taken 4 scores; except for questions 4, 5, 7, and 8 the response never taken 4 scores, almost never taken 3 scores, sometimes taken 2 scores, fairly often taken 1 score, very often taken 0 scores ( reversed scoring). The total score of the scale was ranged from 0 to 40 and categorized into: 0-13 low stress, 14-26 moderate stress, and 27-40 high perceived stress.

### **Instrument three: Self-Efficacy for Managing Chronic Disease Scale**

The Self-Efficacy to Manage Chronic Disease Scale was adopted from (Ritter & Lorig, 2014) to assess the self-efficacy to manage chronic disease in older adults. The scale was translated from English to Arabic language and reviewed by an English Arabic-speaker specialist.

The scoring system of the scale: this scale was composed of 6 questions on a visual analog scale, ranging from 1 (not at all confident) to 10 (totally confident). The total scale score ranged from 1 to 60 that ranged from; 1-20 low self-efficacy, 21-40 moderate self-efficacy, 41- 60 high self-efficacy.

### **Procedure for Data Collection:**

- **Study Period:** Data were collected over 10-months starting from January to the end of October 2023.

- **Approval:** A letter was acquired from the Faculty of Nursing Dean, Menoufia University to the family health unit manager at Sahel El-Gawaber village to gather data and acquire their help through study duration.

- **Ethical Consideration:**

The Ethical approval was obtained from the Research Ethics Committee of the Faculty of Nursing, Menoufia University- Egypt (Research No: 977). to conduct this study. Verbal informed consent was taken from participants after explaining the purpose of the study and they assured that the data will be used for research purpose only.

- **Instruments developments:**

### **Reliability of the instruments:**

The reliability was estimated using the test-retest method. The instruments were administered to participants with two weeks period between two occasions. For Instrument II: Perceived Stress Scale: The Cronbach alpha coefficient was 0.86 which indicates that the scale is reliable. For Instrument III: The Self-Efficacy to Manage Chronic Disease Scale; the Cronbach alpha coefficient was 0.9 which indicates that the scale is reliable. This scale is used to test the fourth hypothesis.

### **Validity of the instruments:**

The content validity was used to test the instrument by a jury of five experts in the field of Community Health Nursing, Geriatric Nursing, and Psychiatric Health Nursing to ascertain the instrument's relevance and completeness. The questionnaire

validity was assessed for its relevancy, fluency, simplicity and clarity of each element in the questionnaire.

#### **Pilot Study:**

- A pilot study was conducted on 10% (n=14) of the studied sample in order to evaluate the clarity and applicability of the instruments, and the period required to fill each instrument. The essential modifications were done. The pilot study was excluded from the sample to ensure the result's stability.
- A baseline assessment (pretest data) of all instruments was filled by the researcher.
- The instrument filling took about 20- 30 minutes for each participant then the researcher measured the blood glucose and blood pressure for each participant. The baseline assessment data was taken from all study and control groups.
- The stress self-management intervention was developed by the researcher after reviewing recent related literature and contains the following; introduction, definition, risk factors, signs and symptoms and complications of diabetes mellitus and hypertension disease, definition of stress, causes of stress, ways to manage stress as breathing and coughing exercise, progressive relaxation technique and physical exercise as walking.
- This intervention was carried out for the study group in three sessions.
- Each session was taken 20- 30 minutes and used a laptop, picture, PowerPoint, lecture, and group discussion in explanation. The intervention was given in small groups of 3- 5 participants.
- The first session; chronic diseases (hypertension & diabetes mellitus); introduction of diseases as definition, risk factors of disease, normal range of blood glucose and blood pressure, signs and symptoms of diseases, complications of diseases.
- The second session; was about stress, definition, causes, risk factors, signs and symptoms of stress and ways to manage stress.
- The third session; Breathing exercises that help in stress management and teaching participants how to perform these exercises as breathing and coughing exercises, relaxation techniques and physical exercises such as walking.
- By the end of sessions, the researcher gives each participant of the study group an intervention booklet.
- The Control group received routine care.
- Post-test 1: was conducted for both groups at three months' post intervention.
- Blood pressure and blood glucose were measured once monthly for six months for both groups.
- The telephone number of the researcher; was given to the participants in the study and control group for contact for any reason.
- Post-test 2: was conducted for both groups at 6 months post intervention.
- Participants of the control group were given a copy of the

intervention booklet at the end of the study.

### **Statistical Analysis:**

The data was entered into a computer and statistically analyzed using Statistical Package for Social Studies version 22. The studied variables' relations were tested. The level of significance was adopted at  $p < 0.05$ .

### **Results:**

**Figure (1):** Shows, the majority of studied elderly in the age group 60-70 years (70%).

**Figure (2):** clarifies that 37.1% is not read & write in both groups compared to 12.9% & 5.7% among (the study & control groups respectively).

**Table (1):** Demonstrated the study and control groups past history of diseases. As demonstrated from the table, there were no significant differences between the study group and the control group for the items of past history. About half of the study group had diabetes and hypertension (55.7%) while in the control group, more than one-third (37.1%) had diabetes and hypertension. Regarding the number of medications prescribed to treat diabetes mellitus and hypertension about the half of study and control group (47.1%, 44.3%) respectively take one drug while for hypertension about the half of study and control group (45.8%, 45.7%) respectively take two drugs.

**Table (2):** showed a significant reduction in the mean total score of the perceived stress scale between pre & post-intervention in the study group  $21.2 \pm 5.5$  to  $11.8 \pm 3.7$  ( $t=0.99$ ,  $P=0.32$ ).

**Table (3):** Demonstrate comparison between study and control groups regarding responses to perceived stress score pre and post-intervention. Post-intervention revealed a significance ( $p < 0.000$ ) in stress levels among the study group than the control. The post-intervention low stress increased from 7.1% (pre-intervention) to 72.9% (post-intervention) among the study group, compared to 4.3% (Pre) to 5.7% among the control group.

**Table (4):** As shown there were highly significant differences between the study and control groups regarding the second post-intervention means random blood sugar of the post-perceived stress levels. The study group showed lower mean controlled random blood sugar in low stress levels ( $141.3 \pm 22.1$ ) than the control group ( $195.7 \pm 27.5$ ), and the difference was highly significant ( $P=0.007$ ). Mean random blood sugar was higher among study group participants with high stress than the control group, ( $200$  vs  $197.4 \pm 33.1$ ) the difference was not statistically significant.

**Table (5):** As demonstrated, there was a significance between the study and control groups regarding second post-intervention mean systolic as well as diastole BP. Study group participants who had low stress levels showed lower mean systolic BP ( $117.3 \pm 16.7$  vs  $135 \pm 5.7$  for the control group), and the difference was highly significant ( $P=0.001$ ). Also, study participants with moderate stress levels showed lower mean systolic BP than the control group ( $122.8 \pm 12.3$  vs  $132.5 \pm 13.1$ ) and the difference was highly significant statistically

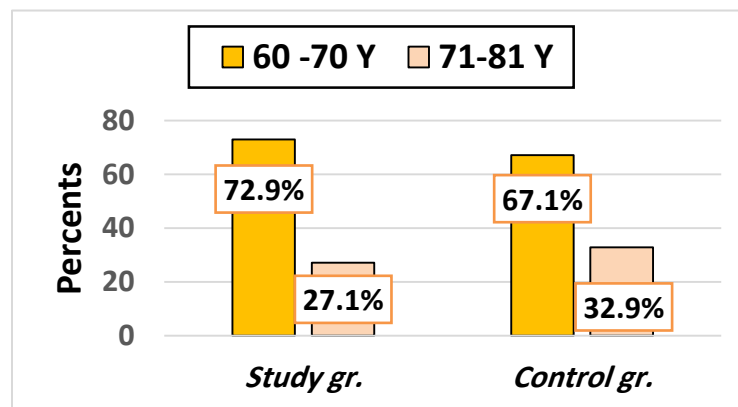
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( $p=0.002$ ). Concerning diastolic BP, the same pattern was observed among study and control group participants.

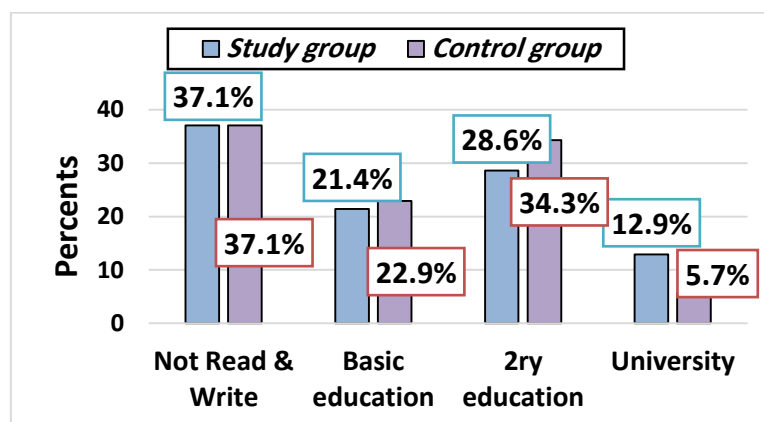
**Table (6)** Demonstrated the relation between post-intervention perceived stress scale levels and self-efficacy of older adults among the study and the control groups. From the table, the self-efficacy is significantly high in participants with low, moderate and high stress among the studied group as

$P < 0.01$  compared to the control group as  $P = 0.57$  NS. The study group who received the stress self-management intervention had high self-efficacy (95.7%) compared to a control group who didn't receive the intervention (10%).

**Figure 1: Age Distribution of study and control groups**



**Figure (2) Education distribution of study and control groups**





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**Table (1) Pre intervention study and control groups past history of diseases**

Past diseases history	Pre- intervention				P <sub>pre</sub>
	Study group		Control group		
	No.	%	No.	%	
Current diseases:					
Hypertension	19	27.2	21	30	$\chi^2=6.2$ , P=0.05
DM	12	17.1	23	32.9	
Both DM& hypertension	39	55.7	26	37.1	
Mean duration of DM	7.0 ± 2.3 Y		6.3±1.7Y		t=0.7,p=0.5
Mean duration of hypertension	8.7±3.6 Y		6.3±4.1 Y		t=2.1,p=0.03
Regularly Taking the medicine:					
No	15	21.4	10	14.3	$\chi^2=6.2$ , P=0.05
To some extent	37	52.9	35	50	
Yes	18	25.7	25	35.7	
One dose	22	31.5	13	18.6	
Two doses	33	47.1	34	48.6	
Three doses or more	3	4.3	0	0	

**Table 2: Perceived Stress Scale items among Studied Groups Pre and Post intervention**

Perceived Stress Scale In the last month,:	Pre intervention		Post intervention		P <sub>pre</sub>	P <sub>post</sub>
	Study	Control	Study	Control		
	Mean±SD	Mean±SD	Mean±SD	Mean±SD		
▪ How often have you experienced upset due to an unexpected event?	2.0±0.8	2.1±0.9	1.3±0.8	2.4±1.1	t=0.85, P=0.39	t=6.6, P<0.0001
▪ How often have you felt that you had no control over the significant aspects of your life?	2.3±0.9	2.6±1.1	1.3±0.7	2.3±1.0	t=0.84, P=0.39	t=6.1, P<0.0001
▪ How often have you experienced tension and stress?	2.5±0.7	2.3±0.7	1.5±0.7	2.3±1.1	t=1.2, P=0.22	t=4.9, P<0.0001
▪ How often have you felt assured that you can manage your personal issues?	1.8±0.9	1.7±0.9	0.6±0.2	2.0±1.0	t=0.43, P=0.73	t=9.4, <0.0001
▪ How often did you feel that everything was going according to plan?	2.0±0.6	1.0±0.5	1.5±0.6	2.2±1.1	t=0.35, P=0.0.7	t=4.2, P<0.0001
▪ How often have you felt like you could not handle everything that you needed to do?	2.2±1.0	2.0±0.4	1.4±0.8	2.0±1.0	t=1.4, P=0.15	t=3.5, P<0.001
▪ How often in your life have you been able to control your annoyances?	1.8±1.0	1.9±0.8	0.7±0.3	2.1±1.1	t=0.41, P=0.68	t=8.4, P<0.0001
▪ How often did you feel like you had everything under control?	1.8±0.9	1.8±0.7	0.7±0.4	1.9±1.0	t=0.07, P=0.94	t=7.6, P<0.0001
▪ Display how often events that happened and were beyond your control made you angry.	2.6±0.6	3.6±0.6	1.5 ± 0.5	2.6±1.0	t=1.2, P=0.23	t=7.1, P<0.0001
▪ Display how many times have you felt like your problems were getting too large for you to handle.	2.2±0.5	2.4±0.4	1.2± 0.6	2.4±1.0	t=1.3, P=0.19	t=6.7, P<0.0001
▪ The mean total score of Perceived Stress Scale	21.2± 5.5	22.3 ± 7.8	11.8 ± 3.7	22.2 ± 5.3	t=0.99, P=0.32	t=12.1, P<0.0001

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**Table (3) Comparison between total perceived stress score pre and post intervention among study and control groups**

Total Perceived stress levels	Pre intervention				Post intervention				P <sub>pre</sub>	P <sub>post</sub>
	Study group		Control group		Study group		Control			
	No.	%	No.	%	No.	%	No.	%		
Low stress	5	7.1	3	4.3	51	72.9	4	5.7	$\chi^2=1.3$ P=0.50	$\chi^2=67.9$ , P<0.0001
Moderate stress	57	81.4	55	78.6	18	25.7	52	74.3		
High stress	8	11.4	12	17.1	1	1.4	14	20		
Total	70	100	70	100	70	100	70	100		
Mean total score of perceived stress	21.2±5.5		22.3±7.8		11.8±4.3		22.2±5.3		t=0.99, P=0.32	t=12.1, P<0.0001

**Table 4: Relation between post intervention Perceived Stress Scale levels of older adults and Second Post Intervention**

Post Perceived Stress levels	Second post intervention Random blood sugar				P value
	Study		Control		
	No.	Mean± SD	No.	Mean± SD	
Low stress (0-13)	51	141.3±22.1	4	195.7±27.5	F=5.4 ,p=0.007
Moderate stress (14-26)	18	159.3±34.3	52	178.3±26.9	F=7.8 ,p=0.001
High stress (27-40)	1	200	14	197.4±33.1	F=1.7 ,p=0.18

**Table 5: Relation between post-intervention levels of Perceived Stress Scale for older adults and their mean systolic and diastolic blood pressure in second post-intervention among the study and control groups (N=140)**

2 <sup>nd</sup> post intervention systolic blood pressure					2 <sup>nd</sup> post intervention diastolic Blood pressure			
Post Perceived Stress levels	Study		Control		Study		Control	
	No.	Mean± SD	No.	Mean± SD	No.	Mean± SD	No.	Mean± SD
<b>Low stress (0-13)</b>	51	117.3±16.7	4	135±5.7	51	77.6±5.1	4	87.5±5
<b>P value</b>	F=6.9, p=0.001				F=2.16, P=0.03			
<b>Moderate stress (14-26)</b>	18	122.8±12.3	52	132.5±13.1	18	80±8.4	52	87.1±9.3
<b>P value</b>	F=4.8, p=0.002				F=2.4, p=0.01			
<b>High stress (27-40)</b>	1	130	14	139.3±9.1	1	80	14	88.6 ±6.6
<b>P value</b>	F=3.37, p=0.009				F=2.3, p=0.01			

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**Table (6) Relation between Post Stress level & Post Self-Efficacy between Study and Control group**

Post Perceived Stress levels	Post intervention Self efficacy								P value		P value
	Study				Control						
	Moderate self –efficacy		High self- efficacy		Moderate self-efficacy		High self- efficacy				
	No.	%	No.	%	No.	%	No.	%	P <sub>study</sub>	P <sub>control</sub>	P <sub>study &amp; control</sub>
Low stress (0-13)	0	0	51	100	4	100	0	0	LR=5.4 , P<0.01	LR=1.1 P=0.57 , NS	LR=21.1, P<0.0001
Moderate stress (14-26)	3	16.7	15	83.3	46	88.5	6	11.5			
High stress (27-40)	0	0	1	100	13	92.9	1	7.1			
Total	3	4.3	67	95.7	63	90	7	10			

## Discussion

Chronic diseases are characterized by their long course. Chronic diseases have garnered interest on a global scale due to their high burden. The WHO must act to support national initiatives after world leaders adopted a political declaration in 2019 that included a strong commitment to help reduce the burden of chronic diseases (WHO, 2021). The purpose of this study was to examine the effect of stress self-management intervention on enhancing stress levels, self-efficacy, and outcomes of older adults with varying chronic diseases (diabetes and hypertension).

The support of the first hypothesis pointed out that the stress levels were highly significantly improved among the study group than the control. The current study finding was consistent with Zamani et al., (2018) who investigated “the effect of a stress management intervention on blood sugar control in older persons with type 2 diabetes, Iran”. They reported that “post-intervention, study group

mean perceived stress score was significantly lower than that of the control group and there was a significant difference in the study group's mean scores across all coping inventory categories for stressful situations”.

In addition, the current study results were similar to Van et al., (2013) who determined “the Effect of Mindfulness-Based Cognitive Therapy (MBCT) to improve health-related quality of life, decreasing emotional distress and blood glucose control among older adult’s patients with diabetes in the Netherlands”. They showed that “in the intervention group, MBCT was more efficient in decreasing stress, anxiety and depressive symptoms. As well, “MBCT was additional efficient in improving quality of life”. Also, the intervention group with high diabetes distress has a tendency to show a decline in diabetes distress compared with the control group”. Those results might prove the effectiveness of the

current study of stress self-management”.

The present study finding was contradicted with Chen et al., (2018) who examined “the effectiveness of lifestyle-based intervention on health-related quality of life among older adults with hypertension in the Los Angeles area in California”. They reported that “Regarding the change in stress levels, there was no statistically significant difference between the intervention and control groups. There might be a change in intervention”. Those discrepancies between results indicated a higher level of adherence of the current study group to stress management than this study.

The support for the second hypothesis that stated, a significantly better blood pressure control between the study and control groups regarding the second post-intervention mean systolic as well as diastole BP. These findings were similar to Zullig et al., (2014) who reported that “Patients' average systolic blood pressure and diastolic blood pressure decreased after six months post interventions”.

Moreover, the present study's finding was Similar to Friedberg et al., (2015) who found that “tailored behavioral intervention for intervention group led to decline in systolic blood pressure and improve blood pressure control than usual care group”. Study findings were supported by a study that was carried out by Shantakumari & Sequeira, (2013) who reported that “After a three-month stress management training intervention, the study group experienced improvements in high-density

lipoprotein, declined in levels of total cholesterol, triglycerides, and low-density lipoprotein and reduced macrovascular complications in diabetes”. This clarifies the effect of stress self-management intervention.

The support for the third hypothesis suggested that there was a higher significant difference between the study and control groups regarding the control of random blood sugar. The present study findings came in agreement with Lee et al., (2017) who stated that “an improvement in post-intervention and the intervention was helpful for improving HbA1c levels”. Moreover, the present study results were Similar to Zamani et al., (2018) who reported that, “Following the intervention, the experimental group's HbA1c levels significantly decreased compared to those of the control group”. This comparison might have indicated that higher level of adherence of the study group to stress management than the control group.

The present study finding was contradicted with Trinidad (2020) who studied “the impact of educational intervention on blood glucose levels, medication adherence, and health literacy among type 2 diabetes mellitus older Hispanic women”. They reported that “the educational intervention had no significant impact on blood glucose control this might be due to change in lifestyle and culture”. This discrepancy may be due to changes in lifestyle and culture”, and the short time period for Trinidad” intervention. This discrepancy may be due to the short time period for

Trinidad” intervention and or the small sample size.

The support for the fourth hypothesis found that the group who received the stress self-management intervention had high self-efficacy (95.7%) compared to a control group who didn't receive the intervention (10%) in post-intervention. This result was parallel with the study done by Luo et al., (2023) Who reported that self-efficacy and perceived stress had a partially mediating influence, between social support and subjective well-being, with respective effect ratios of 48.25% and 23.61%”.

Also, the same results were similar to Liu et al., (2023) who studied the “Relation between self-management behaviors and self-efficacyTop of Form among high risk stroke persons”. Use of self-efficacy support encouraged self-management, while self-management was hindered by objective support and support utilization reduced the overall impact of self-efficacy on self-management by 23.8%, 23.8% and 7.7% respectively”. Lastly Grasaas et al., (2022) concluded that “perceived stress described the majority of the decline in the HRQOL after modifying the impact of self-efficacy, stress itself seems to be an essential target for future management to improve HRQOL, instead of emphasizing on increasing self-efficacy to improve the HRQOL in teenagers”.

#### **Conclusion:**

- Stress self-management intervention was efficient in managing, and lowering stress in

the study group compared to the control group.

- Stress self-management intervention was more efficient in controlling blood pressure in the study group than in the control group.
- Stress self-management intervention was more efficient in controlling blood glucose in the study group than in the control group.
- Stress self-management intervention was more efficient in improving self-efficacy in the study group than in the control group.

#### **Recommendations**

- Enhance awareness of the community regarding stress management.
- Educational program for older adults regarding stress management.
- The nurse should take a more active role in providing educational programs about stress management.

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