THE EFFECT OF DIABETES SELF EFFICACY ENHANCING INTERVENTION ON DIABETES SELF CARE MANAGEMENT BEHAVIORS AMONG JORDANIAN TYPE TWO DIABETES PATIENTS.

***Corresponding Author**:Zainab Fatehi Albikawi RN,MSN, PhD*

The University of Jordan,Nursing Faculty.Amman-Jordan

Email:zainbikawi@gmail.com

Wasileh Petro-Nustas: Professor of Nursing, The University of Jordan,Nursing Faculty.Amman-Jordan

Email:Pero@yahoo.com

Mohammad Abuadas RN,MSN, PhD, Al-Zarqa University, Nursing College. Amman - Jordan

Email : aboads_3@yahoo.com

Abstract

Purpose: This study aimed to evaluate the effectiveness of diabetes self efficacy enhancing intervention among Jordanian patients with type two diabetes on diabetes self care management behaviors.

*Methods**:** Randomized clinical trial design using a structured interview technique was used to collect the data three times; pre-intervention (baseline), 2weeks and 3month follow up. Multistage random sample of 149 patients with DM2 who were seeking care in the Specialized Diabetes Center, were assigned to the intervention group (n=76) and the control group (n=73). Both the control group and intervention group received the routine diabetic educational program .The intervention group participants received the diabetes self efficacy enhancing intervention package based on self-efficacy theory .The study instruments were the summary of diabetes self care management activities and the Demographic and disease history questionnaire.*

*Data Analysis**:** To assess the group differences of dependent variable changes, repeated measures ANOVA were used.*

*Results**:** Significant improvements in self care management behaviors were observed 2 weeks and 3 month post-intervention.*

Conclusion: The findings from this study can guide the health providers to be trained to provide relevant diabetic interventions based on self efficacy theory and can introduce self efficacy enhancing strategies into their nursing interventions, education and research.

***Keywords:** Self Care Management Behaviors, Self Efficacy.*

1.INTRODUCTION

Diabetes mellitus (DM) was considered as disease of a little significance to the world health but is now considered as one of the focal threats to human health in this century. Diabetes is a complex, chronic and metabolic disease that is characterized by chronic hyperglycemia (Guthrie and Guthrie, 2002).According to Whiting, et al. (2011) DM is classified into four main categories: (1) type 1 diabetes (DM1) that formerly known as insulin dependent DM or juvenile DM (affects young people) which encompasses 5- 10% of patients with DM ,(2) type 2 diabetes (DM2) previously known as non insulin dependent DM or adult DM which encompasses 90-95% of patients with DM ,(3) gestational diabetes mellitus (GDM) that develops during pregnancy, it affects 2% to 4% of all pregnancies and (4) other types of DM, which account for 1 to 5% of all cases, are caused by, but not limited to, diseases of the exocrine pancreas (cystic fibrosis), genetic defects in either insulin action or beta cell function , and drug induced such as in the treatment of immunosuppressant drugs or acquired immune deficiency syndrome (AIDS) (IDF, 2011).

The Arab countries appear to have a higher prevalence of DM2 than the international average (International Diabetes Federation [IDF], 2011). The Arab countries appear to have a higher prevalence of DM2 than the international average (IDF, 2013). In Middle Eastern countries, the top highest prevalence of DM2 for age 20 to 79 years are in the Arab countries which are Saudi Arabia (24.0%), Kuwait (23.1%) and Qatar (22.9%). The number of deaths attributed to DM2 among Arab countries is about 170,000 adult people (10%) of all deaths in those countries (IDF, 2011).

Jordan was ranked in the medium prevalence countries (12.3%),approximately 15% of population (400.000) adults were reported to have DM2 (IDF, 2011).Ajlouni, et al. (2008) reported that the prevalence of DM2 in Jordan increased from 12.9% in 1994 to 17.4% in 2004.

People with DM2 are at risk to develop DM life threatening complications such as heart disease, nephropathy, neuropathy, eye complications and foot complications (IDF, 2011). These complications will negatively affect patients' ability of self care management behaviors (American Diabetes Association [ADA], 2010). The treatment and prevention of DM2 complications depend mainly on patients' readiness to self-manage their care on regular basis (Fitzgerald et al., 2000) ; however, an global survey found that only 16.2% of patients with DM2 reported that they carried out all of the recommendations that they had been given about self care management (Funnell, 2006).

Bandura's social cognitive theory which is focusing on the importance of self efficacy on behavioral change has been applied in the health care field, both as a framework for developing useful health interventions and as a model for healthy behavior (Bandura, 1977). Even though patient education has been broadly promoted in different cultures, there is uncertainty about how efficient it can be to achieve the preferred effect of improving DM self care management (Jerant et al., 2009). The majority of the studies about DM2 self care management programs and interventions have focused on improvements in disease outcomes, including decreasing hospitalization, gylcosylated hemoglobin (HbA1c) values, and emergency visits, lower healthcare costs, psychosocial wellbeing and quality of life improvements. Conversely, these studies all have been conducted in Western countries (Foster et al., 2007; Lorig et al., 2009; Rosal et al., 2009).

The current study intervention is based on self-efficacy theory that has its roots based in social cognitive theory (Bandura, 1968) that emphasizes on people cognitive capabilities that enable them to evaluate events and circumstances to make decisions in modifying their behavior (Bandura, 1977) .To date, no Jordanian study have tested or used diabetes self efficacy intervention based on self efficacy theory which might enhance patients' perception of their level of control of DM2 and might enable them to apply more effective DM2 self care management strategies on a day-to-day basis and improve their self efficacy.

2. STUDY AIM

The aim of the current study is to evaluate the effectiveness of diabetes self efficacy enhancing intervention among Jordanian patients with DM2. The evaluation focuseds on improvements in diabetes self care management behaviors.

3. STUDY HYPOTHESIS

Patients who participated in diabetes self efficacy enhancing intervention (DSEEIP) had higher levels of diabetes self care management behaviors following completion of the DSEEIP at 2 weeks post-intervention, and at a three month follow-up evaluation, more than who did not receive the intervention.

3.1. Additional Question

1. Are there differences in the control and intervention group baseline scores for the outcome variable based on the demographic and disease history data?

4.METHODS

4.1.Study Design

Repeated measure (2x3) Randomized Controlled Trial (RCT) design was used to examine the effects of diabetes self efficacy enhancing intervention (DSEEIP) on the self care management behaviors among patient with DM2. A Randomized Controlled Trial (RCT) design was chosen for several reasons. First, RCT designs involve the manipulation of an independent variable (through treatment), and have both the randomization and the control, two properties that are characteristic of true experiments (Polit and Beck, 2013).

4.2. Setting

The clinical setting for this study was in an independent non-profit center which received large numbers of patients with DM1 and DM2 from different cities in Jordan, which is considered as specialized center in DM care in Amman-Jordan.

4.3. Population

The study population was the Jordanian patients with DM2 with the following inclusion criteria: (a) patients should satisfied clinical criteria for DM2 ,(b) patient with DM2 who are taking oral agents**,** (c) patient can be at any stage of their DM diagnosis, length of diagnosis is not a limiting factor in recruitment ,(d) patients are required to speak and read Arabic,(e) patients are required to be equal or over the age of 20 years (f) To be eligible for participation in the current study, the patients had to have average score of less than 6.5 out of 8 on DSES (Stanford Patient Education Research Centre, 2009) and (g) patients are required to have a telephone or mobile in their residence and able to use it effectively. The exclusion criteria were include the following :(a) patients had major complications which would interfere with self-care management behaviors (e.g. legally blind, severe stroke, or undertaking kidney dialysis); patients health records were checked for the presence of any major DM complications, (b) patients currently managing blood glucose levels with the use of insulin injections alone, (c) patients with cognitive impairment and (d) patients who are not able to communicate, (e) patient with any mental or psychiatric illness, patients health records were checked for that.

4.4. Sample Size determination

The power analysis parameters for the repeated measure ANOVA was used an estimated medium effect size of .50, an alpha level of .05, and a power of .80. According to the standardized sample size table (Hinkle & Oliver, 1983) , if the level of the significance is 0.05, the standardized effect size = medium (0.50), and power = 0.80 then 62 subjects are required for each group and the total sample size is 124 participants. A dropout rate (30%) and potential attrition (5%). Thus, 84 participants should be in each group, the total sample size is 168 participants that are needed to be approached in order to retain 124 participants (62 participants per group) at the end of the study.

4.5. Sampling Procedure

The study adopted a multistage simple random sampling method in order to select at least 168 participants (84 participants in each group). In each stage 20 patients were selected by simple random method using Statistical Package for the Social Sciences (SPSS) random number generator .Then randomly by (SPSS) random number generator they were assigned to control and intervention group. A multistage simple random sample is constructed by taking a series of simple random samples in stages .This type of sampling is

often more practical than simple random sampling (Polit and Beck, 2013).

4.6. Stratified Randomization

Screening (pretest) was included all patients who expressed interest in participating in the study and met the inclusion criteria. Stratification method were used based on the demographic data (gender, level of education and marital status),because according to the literature these three demographic data had significant relationship to the current study outcome variables (Al-Amer, et al., 2011, Chlebowy, et al., 2010, Hamedan, et al., 2012).Then the researcher randomly assigned the participants to intervention or the control group using (SPSS) random number generator. To ensure the balance between control and intervention groups.

4.7. Ethical Consideration

Prior to data collection, the Institutional Review Board (IRB) were obtained from the Faculty of Nursing at the University of Jordan. Then the IRB were obtained from the diabetes specialized center. Participants' confidentiality was assured during the study. All participants signed a consent form prior any data collection. A Cover letter was attached to each questionnaires which includes explanation about the study process. Participants' data were secured and saved in the researcher personal computer, and the researcher was the only person has an access to the study data. Permission to use the study instruments were taken from the original authors. The anonymity of participants was assured because the nature of the study design, which require contacting the participants more than one time.

4.8. Study Instrument

The following are the instruments that were used in the current study which are:

(1) The summary of diabetes self care management activities (SDSCA) (Toobert and Glasgow, 1994): is a brief self-report questionnaire and consists of 12 items divided into five self care management activities: diet, practicing exercise, patient self-monitoring of blood glucose, foot care and taking DM medication.

The Demographic and disease history questionnaire**:** This questionnaire includes two parts, the first part includes information concerning participants demographic characteristics that were filled by the participants including: age; gender; education; marital status; employment status and previous DM education other than routine education .The second part is the disease history that were filled by the researcher using patients health records including: diagnosis duration (years); DM complications, types of treatment and history of other diseases.

4.9. Data collection procedure

The data collection in the current study was occurred in three phases as the following.Time 1: screening (pre - intervention or baseline).Time 2: two weeks following screening (post intervention) .Time 3: three months follow up.

4.10. Study Intervention

The study intervention was based on four information resources of self efficacy model for Bandura (1977a) which are performance accomplishment(PA), vicarious experience (VE), verbal persuasion (VP), and self-evaluation(SE) (Bandura, 1977).The details of the current study intervention is summarized in table 1.

4.11. Data Analysis

The study data were analyzed by SPSS version 21. Descriptive statistics including the frequency distribution and percentages were used for the analysis of nominal data as demographic data and disease history of the participants. Independent t-tests were used to analyze differences on continuous data between mean scores for the intervention and control groups. The progressions of the study variable between the intervention group and the control group were described independently for pre- and post-periods respectively. Independent sample *t*-test and chi square were used to compare the demographic data and baseline data between both groups. To assess the group differences of dependent variable changes (the effect of the intervention DSEEIP on the study dependent variable); the researcher used ANOVA, for repeated measures.

5. RESULTS

5.1. Description of the Study Sample

One hundred and sixty eight participants met the study inclusion criteria, agreed and signed the consent form and were randomly assigned to either the control group or intervention group using a random number table (84 participants in the intervention group and 84 participants in the control group).Of these 84 from the intervention group, eight participants did not complete the study. Therefore, the final sample of the intervention group at Time 1 , time 2 , and Time 3 was consisted of 76 participants. In the intervention group, all participants completed the questionnaires and participated in the DSEEIP .On the other hand, of these 84 participants in the control group, eleven participants did not complete the study. Therefore, the final sample of the control group at Time 1 , time 2 , and Time 3 was consisted of 73 participants In the control group, participants were asked to complete questionnaires at Time 1, Time 2, and Time 3 and received the routine care in the DM specialized center. One hundred and forty nine participants were remained after deleting all the information regarding the participants who withdraw. Age ranged from 35-65 years with a mean of 51.40 (SD=6.80) years. The average duration since diagnosis with DM was 6.50 (SD =4.40) years. The sample consisted of (53.70) females. Most participants were married (71.14%), the majority of participants had secondary education (81.20%), and 63.76% did not employed. Half of the participants (51.00%) had a chronic disease other than DM. Half of the participants (51.00%) did not had complications related to DM and (60.40 %) of the participants was taking their pharmacological treatment which consisted from oral hypoglycemic medications only; and 39.60% used a combination of insulin and oral hypoglycemic medications. Only (11.41%) recalled having received DM education session other than their routine education. See table 2

5.2. Checking differences between groups

Before evaluating the effects of the DSEEIP, differences between the groups on a range of demographic and disease history variables were examined. No significant differences were found between the intervention and the control groups on demographics, and disease history variables. This means that both groups had similarities in relation to the characteristics of participants (demographic and disease history variables). See Table 2.1

5.2.1. The dependent Variable

Independent sample t test was used to detect any differences on the dependent variables between the intervention and control group. The mean score for SDSCA for the intervention group is 20.80(SD=4.36); and 20. 67 (SD=4.96) for the control group. Table 2.2 shows also the mean for each SDSCA subscales. No significant differences were found between the intervention and the control groups for the self care management behaviors This means that there were similar mean scores of the dependent variables for the intervention and control groups at the baseline data (see Table 2.2).

5.3. Result of the study Hypothesis

Two-way repeated measures ANOVA was used to examine the differences in the self care management behaviors variable (as measured by the SDSCA) between groups and three time points. The means and standard deviations for the self care management behaviors scores for the three time points and two groups are presented in Table 3.

The main effect of time of measurement of the self care management behaviors for patients with DM2 was significant (Wilks lambda=0. 73, F (2,249) =27.04 , p<.001).The group main effect was also significant between groups, F (1,147) = 66.91, p<.001.The interaction effect of group by time was also significant, (Wilks lambda= 0.64, F (2,249) =31.13 , p<.001). See Table 3.1.

To interpret the significant self care management behaviors variable main effect of time, paired t test was done for each study group to assess the change between Time 1 and Time 2 (Time 1-2),Time 1 and Time 3 (Time 1-3) and Time 2 and Time 3 (Time 2-3).The follow-up paired t-test comparisons for the intervention group showed significant

change for self care management behaviors between Time 1-2 (t= -8.90, p=<.001), Time 1-3 (t= -8.27, p< .001), and no significant change between Time 2-3(t= .66, p=.51).

The follow-up paired t-test comparisons for the control group showed no significant change for self care management behaviors between Time 1-2 (t= -0.90, p=0.37), Time 1-3

(t= -0.11, p=0.91), and Time 2-3(t= 1.02, p=0.31).See table 3.2

To interpret the significant interaction of group by time, independent sample t test were conducted to examine the differences on self care management behaviors score at Time 1, 2 and 3 between the intervention and control group. This test showed that the intervention group had significantly better self efficacy than the control group at Time 2 (t= 7.78, p<.001), and Time 3 (t=8.81, p< .001) but no significant differences between the control and the intervention group at Time 1 (t=.71, p=.86 (See Table 3.3).

These results supported Hypothesis 1: Patients who participated in diabetes self efficacy enhancing intervention (DSEEIP) had higher levels of DM self care management behaviors following completion of the DSEEIP at 2weeks post-intervention, and at a three month post-intervention follow-up evaluation more than who did not receive the intervention. See figure A.

6. DISCUSSION

The current study evaluated an intervention based on self efficacy theory to improve DM self care management behaviors for patient with DM2.Results showed that patient who received the intervention undertook DM self care management behaviors including: diet, exercise, foot care, blood glucose testing and medication more frequently than people who did not receive the intervention at both two weeks post intervention and three month follow-up.

van de Laar and van der Bijl (2001) suggested that developing an educational program based on self-efficacy theory for the self care management of DM is important because several studies of individuals have shown self-efficacy to be an important variable in the self care management of DM2.

This study finding was consistent with the study findings of Tang, et al. (2012) who examined the effects of empowerment based, DM self care management support intervention after1 year follow-up on self care management behaviors. The intervention focused on experiential learning, goal setting, group discussion, problem solving, action planning and emotional coping .They found significant improvements for diet behavior (P = 0.03) including spacing carbohydrates equally along the day (P =0 .006) and using insulin injection as recommended (P = 0.045).

Moreover,Gumbs (2011) explored to what extent the American women participated in DM Self Care Management Behaviors Intervention (DSMBI) and the effect of participation on self care management behaviors. They found that those who received DSMBI were significantly checked their feet on a regular basis and self check their blood glucose regularly and to join in moderate level of physical activity more than who did not participate.

As well as Kirk, et al. (2007) who examined the impact of the adherence based intervention (ABI) on blood glucose control through analyzing self monitoring of blood glucose, (HbA1c), and fasting laboratory glucose. Participants were divided into two groups randomly, the control group and the intervention group. The control group participants received their routine education .In contrast; the participants in their intervention group received a six month behavioral change intervention including a sequence of group and individual sessions. The aim of that intervention was to improve patients DM self efficacy to be responsible about their personal DM treatment plan.

The intervention group participants were found to perform self monitoring of blood glucose after one month 2.35 times per day. In contrast, the control group participants tested 1.37 times per day. A significant difference was also found between groups at three months (p<0.05). The intervention group participants got greater mean of self monitoring of blood glucose daily testing (2.47 times per day) .In comparison the control group participants tested 1.03 times

per day, $p<0.05$). These findings indicated that an intervention based on self efficacy theory can have an effect on the behaviors needed to improve self care management behaviors.

In the current study the medication self care management behavior mean score was reported as the highest self care management behavior. This means that there is no differences in the means of the medication self care management behavior for both groups at three points of time ,even if significant change over the time was found for the intervention group.

These study findings supported the recommendations of previous studies that emphasized the importance of assessing patients' self care management behaviors, so as to better understand obstacles the patients may face and to evaluate how educational or other self care management strategies and interventions may improve patients' self care management behaviors (Toobert, et al, 2000).

Adherence to DM medication, or rather, proper medication taking, is vital for effective DM self care management. However, there are several possible explanations for the current study result. Either, patients were over estimating their adherence to medication or the method used to assess medication adherence might be subjected to the influence of a "socially desirable answer" leading to unreliable results. Cook, et al., (2005) have noted that some instrument may not accurately measure for medication adherence, which might be the case of the current study findings.

The current study results supported its theoretical framework. Bandura's self efficacy theory provides a comprehensive theoretical framework for human behavior. Self efficacy, defined by Bandura (I977) is a belief in one's capability to successfully prevail over the difficulty of any situation in order to achieve a desired outcome such as DM2 self care management behaviors including areas of diet, blood glucose testing, foot care , exercise and medication.

Finally, the finding of the current study met the hypothesis and was consistent with the current study self efficacy model for evaluation of the DSEEIP for patients with DM2.

6. CONCLUSION

Diabetes self-efficacy enhancing intervention package (DSEEIP) emphasized self efficacy enhancing and goal setting skills in order to increase self efficacy and change people's behaviors. Four sources of information adopted from Bandura (1977) are applied in the intervention of the DSEEIP. The study findings of the present study indicate the DSEEIP can advance the level of self care management behaviors at two weeks and three month post intervention. The level of self care management behaviors for both groups at baseline time are alarming. The findings from this study can guide the health providers to be trained to provide relevant diabetic interventions based on self efficacy theory and can introduce self efficacy enhancing strategies into their nursing interventions, education and research.

Table 1.*DSEEIP: Diabetes Self Efficacy Enhancing Intervention Package*

Source of information used	Intervention	Content
Vicarious experience (VE)	1) 17 minutes DVD viewing	• The DVD showed, knowledge, brief statistics about DM and one patient with DM2 as model that was used self care management activities (Youtube, 2013).
Vicarious experience (VE)&Performance accomplishments(PA)	2) Receives the "Diabetes Self care management" booklet	• The booklet emphasized more on DM2 about how to perform their daily self care management activities including diet control, physical activity, blood glucose testing, adherence to medication regime, and foot care. • It is the translated Arabic copy for diabetes self care management booklet which was developed by Wisconsin Diabetes Prevention and Control Program (2013).
Performance accomplishment(PA) Vicarious experience(VE) Verbal persuasion(VP) Self-evaluation (SE)	3) Efficacy-enhancing counseling rehearsal sessions	• One efficacy-enhancing counseling rehearsal sessions was conducted in one of the DM center room; this session was conducted by the researcher which aims to increase patients' confidence in their ability to DM2 self care management and improve their psychological wellbeing. • Participants were participated in groups that were limited to 3-4 participants in each group. • The session with DVD showing lasted for 30-40 minutes and contained self-efficacy enhancing skills and self-goal setting which was validated by nurse counselor. The booklet was used in the session. • The researcher asked the participants questions about the content of the booklet which can promote discussions • Goal-setting sheets for DM2 self care management were included in the booklet to encourage people to keep a record of their own DM control as seen in the booklet (see appendix G).
Performance accomplishment (PA)&Verbal persuasion (VP)	4) Telephone follow-up	• Telephone follow-up were provided for the intervention group.The purpose of calling was to foster continued performance accomplishment (PA) via verbal persuasion (VP).

Table 2.*Demographics and Disease history Variables*

Variables	**% (n)**
Gender	
Male	46.30%(69)
Female	53.69%80)
Marital status	
Married	71.14%(106)
Single	8.72% (13)
Divorced	8.05% (12)
Widowed	12.08%(18)
Employment status	
Employed	36.20% (54)
Not employed or retired	63.79(95)
Current therapy	
Oral Hypoglycemia only	60.40% (90)
Oral Hypoglycemia and insulin	39.59%(59)
The Level of Education	
Intermediate	8.72%(13)
Secondary	81.20%(121)
Postgraduate	10.06%(15)
Chronic Diseases	
Hypertension	38.92%(58)
Other diseases	10.06%(15)
No other chronic disease	51.00%(76)
Diabetes Complications	
Retinopathy	13.42% (20)
Nephropathy	8.05%(12)
Foot Complication	8.72% (13)
Macrovascular disease	8.05%(12)

Neuropathy	10.73% (16)
No Complication	51.00% (76)
Other education	
Yes	11.41%(17)
No	88.59%(132)

Table 2.1.*Comparisons of the demographics and diseases history between intervention and control groups*

Variables	**Intervention**	**(n= 76)**	**Control**	**(n=73)**	**Significance (p)***
Demographics:	Mean	SD	Mean	SD	
Age	50.73%	6.95	52.20%	6.76	t=-1.31 ,p=.39
Length of diagnosis (years)	6.15	4.62	6.80	4.21	t =.89,p=.37
Gender	**Count**	**%**	**Count**	**%**	
Male	35	46.05%	34	46.58%	X2=.004 P=.95
Female	41	53.94%	39	53.42%	
Level of Education					X2=.29 P=.87
Intermediate	6	7.90%	7	9.60%	
Secondary	63	82.90%	58	79.50%	
Postgraduate	7	9.20%	8	11%	
Marital Status					X2=.17 P=.98
Married	55	72.37%	51	69.86%	
Single	6	7.89%	7	9.59%	
Divorced	6	7.89%	6	8.21%	
Widowed	9	7.89%	9	12.32%	
Employment status					X2=.03 P=.85
Employed	27	35.5%	27	37%	
Not employed or retired	49	64.5%	46	63%	
Current therapy					X2=1.0 P=.30
Oral Hypoglycemia only	49	64.5%	41	56.2%	
Oral Hypoglycemia and insulin	27	35.5%	32	43.8%	
Chronic Diseases					X2=1.4

					P=.48
Hypertension	26	34.2%	32	43.8%	
Other diseases	8	10.5%	7	9.6%	
No other chronic disease	42	55.3%	34	46.6%	
Diabetes Complications					X2=.69 P=.98
Retinopathy	9	11.84%	11	15.06%	
Nephropathy	6	7.89%	6	8.21%	
Foot Complication	6	7.89%	7	9.59%	
Macrovascular disease	6	7.89%	6	8.21%	
Neuropathy	8	10.52%	8	10.95%	
No Complication	41	53.94%	35	47.95%	
Other Education Session					X2=1.44 P=.23
Yes	11		6		
No	65		67		

The significance level P<.05

Table 2.2.*Differences between groups on the key variables at baseline time.*

Study Variable	**Group**	**N**	**Mean**	**SD**	**t***	**p***
Self care management	Intervention	76	20.70	4.36	0.17	0.86
Behaviors	Control	73	20.67	4.96		
Diet	Intervention	76	7.50	1.01	0.81	0.42*
	Control	73	7.14	1.56		
Exercise	Intervention	76	1.14	1.15	-.1.12	0.26*
	Control	73	1.22	.95		
Blood sugar testing	Intervention	76	.93	1.58	-0.15	0.88
	Control	73	.95	1.50		
Foot care	Intervention	76	4.94	3.37	0.21	0.83

	Control	73	4.79	3.82		
Medication	Intervention	76	6.67	.76	0.30	0.80
	Control	73	6.57	.88		

***Level of significance for two tailed test p<0.05.**

**** Independent sample t-test**

Table3.*The mean (SD) for the Self Care Management behaviors variables*

	Intervention group (n=76)			**Control group (n=73)**		
Self Care Management Activities	**Time 1 M(SD)**	**Time 2 M(SD)**	**Time 3 M(SD)**	**Time 1 M(SD)**	**Time 2 M(SD)**	**Time 3 M(SD)**
	20.70 (4.36)	37.34 (15.4)	36.92 (16.16)	20.67 (4.96)	20.56 (10.16)	19.37 (15.73)

Table 3.1.*Repeated measure analysis of variance for the Self Care Management behaviors*

Variable	**F value**	**Wilks Lambda**	**p value**	**Eta square**
Self Care Management Activities				
Group	66.91		<.001	0.27
Time	27.04	.73	<.001	0.27
Group xTime	31.13	.64	<.001	0.31

Table 3.2.*Paired t test results for Self Care Management behaviors variable*

Group	**Time**	**t**	**p***
Intervention group	1-2	-8.90	<.001*
	1-3	-8.27	<.001*
	2-3	0.66	0.051*
Control group	1-2	-0.90	0.37*
	1-3	-0.11	0.91*
	2-3	1.02	0. 31*

*Level of significance for two tailed test p<.05.

** Paired t-test.

Table 3.3.Comparisons of Self Care Management behaviors variable by time of groups (Independent-t Test)

Time	t	p*
1	0.71	0.86*
2	7.78	<.001*
3	8.81	<.001*

*Level of significance for two tailed test p<0.05.

**** Independent sample t-test**

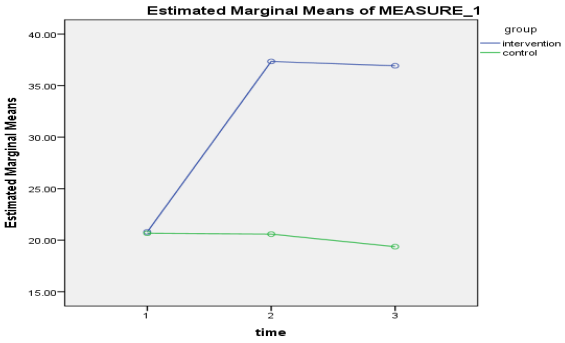

***Figure A*: Graph of the interaction between time and group for self care management behaviors.**

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