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The Effect of Educational Intervention on Knowledge and Quality of Life among Diabetic Women

Sahar Mohammed Abdullhameed, [1] Wafaa Mohammed A.E. Shokry [2]

[1] Lecturer of Psychiatric and Mental Health Nursing, Faculty of Nursing, EL Mania University, Egypt
[2] Lecturer of Nursing Administration, Faculty of Nursing, Menoufia University. Egypt.

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Abstract: Educating diabetic women is essential for controlling and improving health status, awareness regarding diabetes and their quality of life. The aim of this study was conducted to determine the impact of educational intervention on knowledge and quality of life among diabetic women. Purposive sampling technique was used, a total number was 40 diabetic women with type2 were included in the study. This study was conducted in diabetes outpatient clinics and medical and surgical departments at General Menouf Hospital at Menouf City in Egypt during 2016-2017. A Structured Interviewing Questionnaire and QOL Questionnaire was developed based on WHOQOL-HIV BREF. A quasi-experimental, prospective study was conducted with one group (diabetic women) using a pre-test and post-test design. The research findings revealed a highly statistically significant improvement in diabetic women' knowledge related to diet management, foot care, symptoms of hyperglycemia, the importance of exercise, and the importance of regular investigation in the post educational intervention in comparison to pre-test at $p \leq 0.001$.Also, there was a significant improvement in the post educational intervention related to physical, psychological, and socio-environmental aspects of diabetic women' quality of life at $p \leq 0.05$. In study conclusion, the knowledge and quality of life were improved among diabetic women through implementing educational intervention at General Menouf Hospital. This study recommends to activating the role of the primary health care centers to participate in making an annual plan for diabetic patients for their education. More programs should be reconstructed to improve the diabetic women's quality of life.

Keywords: Diabetes mellitus, educational intervention, quality of life, physical, psychological, socio-environmental.

INTRODUCTION

Diabetes mellitus (DM) is associated with numerous acute and chronic complications that decrease the health-related quality of life and contribute to suboptimal psychological, physical, socio-environmental, and earlier mortality. [1, 2] Unhealthy eating habits and depression have negative effects on health-related quality of life of diabetic patients. [3, 4] Worldwide, 366 million people with diabetes mellitus were estimated in the year 2011, and numbers are expected to double by 2030. [5] Diabetes is the 5th reason of death in Europe and about 15% of financial to the public health services in the USA is for diabetes. [6]

The International Diabetes Federation (IDF) estimated that there are 382 million diabetic patients worldwide in 2013, also 80% of them lived in low-and-middle income countries. [7] The Diabetic patients in Egypt were estimated to be 7.5 million in 2013 and are projected to reach 13.1 million by the year 2030. IDF illustrated that Egypt as the ninth leading country in the world for patients' numbers with type 2 diabetes. This sharp increasing led to either high-risk factors for type 2 diabetes such as obesity, change in eating pattern and physical inactivity or other risk factors unique to Egypt. [8]

Health-related quality of life (HRQOL) refers to the physical, psychological, and socio-environmental domains of health that are influenced by a person's experiences, beliefs, expectations, and perceptions; therefore, health care providers should strive to understand the physical, emotional, and social impacts of chronic disease such as DM. [9] Diabetes Mellitus negatively impacts on health-related quality of life, this negative impact affects multiple aspects of a person's life including the psychological impact of being chronically ill, dietary restrictions, changes in social life, symptoms of inadequate metabolic control, chronic complications and ultimately lifelong disabilities. [10] The need to provide health educational program to prevent complications of diabetes mellitus among women and to increase the awareness of diabetic women about their condition and improved quality of life. [11, 12] The importance of health education in the treatment of diabetic patients and preventing acute and chronic complications and improving one's quality of life have been demonstrated in different studies. [13] The quality of life (QOL) consider an essential part of diabetes patients' health outcomes, however, enhanced QOL in diabetic patients is related to health education. [14]

There are multifactorial reasons for lower QOL among diabetics, they are more likely to be older, overweight, less likely to exercise, and more likely to have co-morbidities such as hypertension, coronary artery disease, hypercholesterolemia; and are more likely to have complications such as symptomatic hyperglycemia, hypoglycemia, retinopathy, nephropathy, upper gastrointestinal symptoms, impotence, amputations, and, lower health-related QOL scores are associated with all these aspects. [15]

However, there is a deficiency of knowledge and skills in the control of the disease in 50% to 80% of individuals with diabetes and glycemic control is achieved by less than half of the patients under treatment with type 2 Diabetes Mellitus. [16] The great difficulty lies in finding the way to

promote self-control or self-care. Thus, educational techniques have evolved over the last decade, changing didactic presentations for interventions that promote the autonomy of the patient, with their participation and collaboration. [17, 18] Management of diabetes greatly depends on the ability of the affected person to carry out self-care in his daily lives, and patient education is the cornerstone to achieving this objective. [19] Diabetic patients often have inadequate knowledge about nature, risk factors and associated complications of diabetes and this negatively affects their attitudes and practices towards its care. Hence, diabetes education and on- going diabetes support are considered an integral part of comprehensive diabetes care to achieve better control of diabetes. Also, patient health education has an important role in preventing acute complications and reducing the risk of long-term complications. [20]

The American Standardization of Diabetes Self-Management Education highlights the importance of the educational process based on the educational needs of the population, their diabetes knowledge, willingness to learn, education level, family support and financial status. [21] Other authors defined Self-care education as the process of broadening knowledge and skills that involve bodily, dietary, therapeutic and other practices performed by the patient, to improve metabolic control and preserve or improve the quality of life at a reasonable cost. [22]

The value of optimizing QOL has increasingly been recognized not only because it represents an important goal for nursing care in its own right but also because of the relationship between poor QOL and adverse outcomes in people with diabetes mellitus, including lack response to therapy, progression of disease and even quality of life represents a broad, multi-dimensional concept that reflects an individual's sense of well-being or satisfaction with life circumstances. [23]

The aim of this study is to improve diabetic women's knowledge and quality of life after implementing diabetes educational intervention. **Objectives include**: ***a)*** Determine the impact of educational intervention on knowledge of diabetic women at General Menouf Hospital; ***b)*** Evaluate the effect of educational intervention on quality of life among diabetic women before and after education.

Hypothesis:

H_1. There is a significant difference in diabetic women's knowledge before and after diabetes educational intervention.

H_2. There is a significant difference between pre and post educational intervention as regarding physical aspects of quality of life among diabetic women

H_3. There is a significant difference between pre and post educational intervention as regarding psychological aspects of quality of life among diabetic women**.**

H_4. There is a significant difference between pre and post educational intervention as regarding socio-environmental of quality of life among diabetic women

The Significance of the Study:

Since few studies have been conducted on the effect of educational intervention on the QOL among diabetic patients and their awareness of the disease. Due to a high prevalence of diabetes mellitus among adult women in Egypt as mentioned previously and lack diabetic patients' knowledge for controlling their disease and its complications. Therefore, this study was conducted to develop educational strategies to improve knowledge and quality of life of diabetic women. Consequently to reduce the morbidity and mortality caused by diabetes

SUBJECTS AND METHODS

Design:

A quasi-experimental, prospective study was conducted with one group (diabetic women) using a pre-test and post-test design in the current study.

Subject and Setting:

Purposive sampling technique was used in this study. Sample participants included 40 female adults with type 2 diabetes who regularly visit the diabetes clinic and hospitalized diabetic patients in the medical and surgical departments. Excluded in the study are patients whose age are more than 65 years old, negligence patients. This a prospective study carried out in diabetes outpatient clinics and medical and surgical departments of General Menouf Hospital at Menouf City in Egypt during 2016-2017.

Data collection tools:

Two tools were used to fulfill the aim of the current study. ***The first tool:*** A Structured Interviewing Questionnaire for diabetic women. It categorized in; ***Part I:*** Socio-demographic data such as age, marital status, education, living status, income, and duration of disease; ***Part II:*** constructed diabetic women' knowledge questionnaire aimed to evaluate diabetic women' knowledge before and after an educational intervention. It consists of 6 items which include information about; signs of diabetes, diet management, foot care, symptoms of hypoglycemia, the importance of exercise, and the importance of regular investigation. It includes open-ended questions. The researcher corrected open-ended questions and translate the diabetic women' responses into corrected and uncorrected answers. ***The second tool:*** Quality of Life Questionnaire was developed based on WHOQOL-HIV BREF Questionnaire (World Health Organization, 2002). [24] This questionnaire was modified to assess the diabetic women' quality of life aspects such as physical health (3items), psychological (3items), and socio-environmental (4items) before and after an educational intervention. In this Questionnaire, the respondent answer of items was scored as always (3), sometimes (2), and never (1). In addition, some responses were measured as very good (3), good (2), and bad(1).

Tools validity and reliability:

The contents of the questionnaire submitted to five experts (2 from nursing administration, one from family and community health nursing, one from medical surgical nursing and one from psychiatric nursing) to investigate the content validity. Modifications were carried out on a clarity and appropriateness of tools. Reliability analysis was conducted to test the internal consistency of the questionnaire items by using Cronbach's alpha coefficients. The normal value of Cronbach alpha coefficients ranges

from 0.60 to 0.95. [25] The Cronbach's alpha of the questionnaire items was proved reliable where α = 0.91, indicating good reliability for questionnaire items.

Pilot Study:

After review of the questionnaire by experts and its approval, a pilot study was carried out before starting the actual data collection. The purpose of the pilot study was to ascertain the clarity and applicability of the study tools and to identify the obstacles and problems that may be encountered during data collection. It also helped to estimate the time needed to fill the questionnaire. Based on the results of pilot study, modifications, and clarification of some questions were done. A pilot study was done on 10 diabetic women who regularly visit the diabetes clinic and hospitalized in the medical and surgical departments, and those were not included in the total sample of the research work to ensure the stability of the answers.

Ethical consideration:

Prior to data gathering, the researchers obtained permission from the concerned research authorities at the General Menouf Hospital. In addition, the purpose of the study was fully explained before obtaining the respondents' consent to participate in the study. The study was reviewed and approved ethically. Confidentiality of information was maintained for each of the study subjects.

Procedure:

The researcher collected the data during summer 2016. After seeking the consent of the diabetic women to participate in the study, data collection was conducted throughout the following steps: **First step (assessment);** throughout this step, the questionnaire related to diabetic women' knowledge and their quality of life were distributed to the study sample to test diabetic women' knowledge and quality of life in the pre-test. The collected data analyzed to determine diabetic women' needs. **The second step (planning);** educational intervention was designed based on literature review and the pre-test results. The aim of an educational intervention to improve diabetic women' knowledge and their quality of life. The following topics were covered in the diabetic educational intervention;

- Signs of diabetes
- Diet management
- Foot care
- Symptoms of hypoglycemia
- Importance of exercise
- Importance of regular investigation

Constructed diabetic women' knowledge questionnaire and Quality of Life Questionnaire were distributed to diabetic women before beginning the educational intervention.

The third step (implementing educational intervention):

The study participants (40 diabetic women) were divided into four groups, each group has 10 diabetic women. Each group received diabetic educational intervention in four different sessions; each session was conducted for one hour weekly. The educational intervention items are regarding diet management; diabetic women were asked questions about nutrient with high caloric content and the recommended daily calorie, these details are necessary to prevent obesity and regulating blood glucose. Patients were also asked whether they are inspecting their feet daily. Concerning exercises, the patient was asked about their exercise practices specifically walking regularly. The diabetic women were asked about their foot care such as; Daily washing the feet; Drying the feet after washing; Keeping the skin of the feet soft to prevent dryness; Inspection of feet once a day; Checking the shoes from inside before wearing. Different educational methods were used such as writing board, videos and printed handouts and photographs. At the end of the educational intervention, open discussion with the diabetic women about any clarification and difficulties. **Fourth step (evaluation):** after three months post educational intervention, reassessment of patient's knowledge and their quality of life was conducted to examine to what extent the intervention improved the diabetic women' knowledge and quality of life.

Statistical design:

Data entry was done using the statistical package for Social Sciences (SPSS version 20) to analyzed data for a present study. Data were presented using descriptive statistics in the form of numbers and percentages. Qualitative variables were compared by Chi-square test (for nonparametric data) to determine the effect of educational intervention on knowledge and quality of life among diabetic women before and after the education of diabetic women. P -value was considered significant when $P < 0.05$.

RESULTS

Table (1) Socio-demographic characteristics of diabetic women

The finding indicated that the majority of the sample were more than 40 years old, married and half of the diabetic women's educational attainment was primary level. In relation to living status, the majority of the diabetic women were living with their families. Finally, with regards to their income, 65% of the diabetic women have enough income for living.

Table (2) Distribution of diabetic women' knowledge before and after an educational intervention.

The results revealed a highly statistically significant improvement in diabetic women' knowledge related to diet management, foot care, symptoms of hyperglycemia, the importance of exercise, and the importance of regular investigation in the post diabetic educational intervention in comparison to pre-test at $p \leq 0.001$. While, there was a significant improvement in post educational intervention related to items of signs of diabetes (0.04) and symptoms of hypoglycemia (0.02) at $p \leq 0.05$.

Table (3). Comparison of physical aspects' quality of life before and after educational intervention among diabetic women

Concerning physical aspects of diabetic women' quality of life. This finding revealed that the higher percentage of diabetic women were able to perform daily life activities after educational intervention (62.5%) than before educational intervention (25%) with a highly significant difference between pre and post educational intervention at $p \leq 0.001$. The current result reported that 50% of the diabetic women were always satisfied with their sleep and rest post educational intervention in comparison to pre educational intervention (20%) with a highly significant

difference between pre and post educational intervention at p≤ 0.001. In relation to diabetic women' feeling with physical pain and discomfort, the majority of diabetic women not feel with physical pain and discomfort post educational intervention (50%) in comparison to pre educational intervention (25%) with a statistically significant difference at p= 0.024.

Table (4) Comparison of psychological aspects' quality of life before and after educational intervention among diabetic women

Regarding psychological aspects of diabetic women' quality of life. Results illustrated that half of the diabetic women has a very good meaning of life post educational intervention more than pre-intervention (25%) and the statistically significant improvement between them at P= 0.021*. This finding indicated that the majority of the diabetic women (55%) were always satisfied with their self in the post educational intervention in comparison to pre educational intervention (20%) with a significant improvement between them at P= 0.025. Moreover, there was a significantly higher improvement in diabetic women' satisfaction about their concentration after the educational intervention than before intervention at p≤ 0.001.

Table (5) Comparison of socio-environmental aspects' quality of life before and after educational intervention among diabetic women.

The current results revealed a significant improvement in three socio-environmental aspects of diabetic women' quality of life post educational intervention, while, there was no significant difference between before and after educational intervention related to diabetic women' satisfaction about their home environment.

Table (1) Socio-demographic characteristics of diabetic women

Socio-demographic Characteristics	Diabetic patients	
	No. (n=40)	Percent (100%)
Age		
≤40	12	30%
>40	17	42.5%
50-60	11	27.5%
Marital status		
Single	7	17.5%
Married	18	45%
Divorced	5	12.5%
Spouse passed away	10	25%
Education		
Illiterate	5	12.5%
Primary level	20	50%
Secondary Level (High School)	10	25%
Tertiary Level	5	12.5%
Living status		
With family	35	87.5%
Alone	5	12.5%
Income		
Enough	26	65%
Not enough	14	35%
Duration of Disease (years)		
<10		
≥ 10	30	75%
	10	25%

Table (2) Distribution of diabetic women' knowledge before and after an educational intervention.

Characteristics	Diabetic women' Knowledge (pre)(n=40)		Diabetic women' Knowledge (post)(n=40)		Chi-square Test	
	N	%	N	%	X^2	P-value
Signs of diabetes						
Incorrect answer	29	72.5	20	50	4.26	0.04*
Correct answer	11	27.5	20	50		
Diet management						
Incorrect answer	24	60	12	30	7.27	0.007**
Correct answer	16	40	28	70		
Foot care						
Incorrect answer	29	72.5	12	30	14.45	0.000**
Correct answer	11	27.5	28	70		
Symptoms of hypoglycemia						
Incorrect answer	25	62.5	14	35	5.60	0.02*
Correct answer	15	37.5	26	65		
Symptoms of hyperglycemia						
Incorrect answer	30	75	12	30	16.2	0.000**
Correct answer	10	25	28	70		
Importance of exercise						
Incorrect answer	27	67.5	11	27.5	12.83	0.000**
Correct answer	13	32.5	29	72.5		
Importance of regular investigation						
Incorrect answer						
Correct answer	29	72.5	17	42.5	7.36	0.006**
	11	27.5	23	57.5		
***Statistically significant at p ≤ 0.05**		****Highly statistically significant at p≤ 0.001**				

Table (3). Comparison of physical aspects' quality of life before and after educational intervention among diabetic women

Physical Aspects	Diabetic women (pre)		Diabetic women (post)		Chi-square Test	
	No	%	No.	%	X^2	P Value
1. Are you able to perform daily life activities?						
Very good	10	25%	25	62.5%		
Good	20	50%	10	25%	11.4	0.000**
Bad	10	25%	5	12.5%		
2. Are you satisfied with your sleep and rest?						
Always	8	20%	20	50%	11.68	0.000**
Sometimes	15	37.5%	15	37.5%		
Never	17	42.5%	5	12.5%		
3. Do you feel with physical pain and discomfort?						
Always	12	30%	8	20%	7.58	0.024
Sometimes	18	45%	10	25%		
Never	10	25%	23	55%		
***Statistically significant at p ≤ 0.05**			****Highly statistically significant at p≤ 0.001**			

Table (4) Comparison of psychological aspects' quality of life before and after educational intervention among diabetic women

Psychological Aspects	Diabetic women (pre)		Diabetic women (post)		Chi-square Test	
	No.	%	No.	%	X^2	P value
1. Do you have a good meaning for your life?						
Very good	10	25%	20	50%	8.72	0.021*
Good	9	22.5%	15	37.5%		
Bad	21	52.5%	10	25%		
2. Are you satisfied with yourself?						
Always	12	30%	22	55%	7.82	0.025*
Sometimes	10	25%	11	27.5%		
Never	18	45%	7	17.5%		
3. Are you satisfied with your concentration?						
Always	9	22.5%	16	40%	13.74	0.000**
Sometimes	12	30%	20	50%		
Never	19	47.5%	4	10%		
***Statistically significant at p ≤ 0.05**		****Highly statistically significant at p≤ 0.001**				

Table (5) Comparison of socio-environmental aspects' quality of life before and after educational intervention among diabetic women.

Socio-environment Aspects	Diabetic women (pre)		Diabetic women (post)		Chi- square Test	
	No.	%	No.	%	X^2	P Value
1. Are you satisfied with your interpersonal relation?						
Always	10	25%	17	42.5%	6.26	0.04*
Sometimes	13	32.5%	16	40%		
Never	17	42.5%	7	17.5%		
2. Are you satisfied with your home environment?						0.92
Always	15	37.5%	18	45%	1.54	
Sometimes	20	50%	20	50%		
Never	5	12.5%	2	5%		
3. Do you feel safe?						
Very good	11	27.5%	20	50%	6.48	0.03*
Good	11	27.5%	12	30%		
Bad	18	45%	8	20%		
4. Are you satisfied with your travel for enjoyment?						
Always	9	22.5%	20	50%	13.76	0.000**
Sometimes	11	27.5%	15	37.5%		
Never	20	50%	5	12.5%		
No statistically significant at P > 0.05			***Statistically significant at p ≤ 0.05**			
****Highly statistically significant at p≤ 0.001**						

DISCUSSION

DM educational intervention is important in health care organizations in order to increase diabetic patients' awareness and achieve satisfactorily-controlled diabetes and has an improved QOL. The purpose of this study is to evaluate the impact of educational intervention on knowledge and quality of life among diabetic women at General Menouf Hospital.

Regarding ***diabetic women' knowledge*** before and after the educational intervention. The results revealed a highly significant improvement of diabetic women' knowledge related to diet management, foot care, symptoms of hyperglycemia, an importance of exercise, and an importance of regular investigation in the post educational intervention in comparison to pre-intervention at p≤ 0.001. While, there was a significant improvement of diabetic women' knowledge in post educational intervention related to items of signs of diabetes (0.04) and symptoms of hypoglycemia (0.02) at p≤ 0.05, these indicating that diabetic educational intervention raised awareness about the disease and may be delay complications. These findings were consistent with the study done by ***Ahmed et. al.*** showed that knowledge of diabetic patients specifically regarding meal plan, exercise, and foot care improved post diabetic education and there was a statistically significance difference between pre-education (20%, 23%, and 5%) and post educational program (68.2%, 44.7%, and 89.4%) respectively. [(28)] Also the current result similar to study of ***Atak et. al.*** reported that ten patients could name nutrients with high caloric content before the program which rose to 20 in the post-intervention and the difference was significant at p= 0.037. [(29)] In addition, the study of ***Awouda et. al.*** which illustrated that diabetic patients' knowledge were gained after the implementation of the intervention; especially in the areas of the signs and symptoms of hypoglycemia and hyperglycemia, signs and symptoms of the disease, importance of exercises, and foot care with a statistically significant level at (T-value 7.38) and (P. value 0.000). [(11)] In addition, the study of ***Pereira et. al.*** revealed in their study findings a significant increase in knowledge about diabetes among the patients in all the dimensions (p<0.05). [(28)] Meanwhile, Increasing of diabetic women awareness has been identified as one of the reasons in order to control their disease.

Regarding ***physical aspects of diabetic women' quality of life***. This finding indicated that the higher percentage of diabetic women were able to perform daily life activities after an educational intervention (62.5%) than before an educational intervention (25%) with significant improvement post educational intervention at P= 0.000. The current result reported that 50% of the diabetic women were always satisfied with their sleep and rest post educational intervention in comparison to pre educational intervention (20%) with a significant improvement post educational intervention at P= 0.000. In relation to diabetic women' feeling with physical pain and discomfort, the majority of diabetic women not feel with physical pain and discomfort post educational intervention (50%) in comparison to pre educational intervention (25%) with a statistically significant difference at P= 0.024. These findings are consistent with the study of Pereira, who found that the physical health of diabetic patients improved specifically in performing daily life activities post education. [(28)] Additionally, the current results are supported by the study finding that revealed the highest value was observed for the physical functioning dimensions post educational intervention. [(29)] Accordance with ***Koopmanschap*** who reported that the diabetic women are not satisfied with their sleep. [(30)] Also, the study of ***D'souza, et.al***. which found that Oman diabetic patients are not satisfied with their sleeping and severely affected physical aspects with a complication of diabetes. [(31)] Our research finding was compatible with the study which reported that the mean values of bodily pain were 57.85 among diabetic patients before the educational intervention in comparison to five-month after an educational intervention (59.31), there was little improvement observed in the quality of life of bodily pain. [(29)]

Concerning ***psychological aspects of diabetic women' quality of life***. The results illustrated that half of the diabetic women has a very good meaning of life post educational intervention more than pre-intervention (25%) and the statistically significant improvement between them at P= 0.021. This finding indicated that the majority of the diabetic women (55%) were always satisfied with their self in the post educational intervention in comparison to pre educational intervention (20%) with a significant improvement between them at P= 0.025. Moreover, there was a significantly higher improvement in diabetic women' satisfaction about their concentration after the educational intervention than before intervention at p≤ 0.001. This finding was consistent with the study which indicated that there was a significant improvement in psychological domains of diabetic patients' QOL after intervention at (P < 0.001). [(31)] Moreover, this result was similar with ***Samadi et. al.*** who revealed that the diabetic women increased their self-concept after the quality of life education and there was a significant difference between pre and post education (P<0.05). [(32)] Also, the current study finding was in the same line of the study which revealed increasing self-satisfaction and their concentration post education, the necessity of using an intervention that can foster self-satisfaction and control the factors influencing QOL. [(33)] The present results consistent with ***Elkurdy et. al***. who indicated that diabetic patients increased their motivation and psychological well-being after the educational intervention. [(34)]

As regard to ***socio-environmental aspects of diabetic women' quality of life***. The current results revealed a significant improvement in three socio-environmental aspects of diabetic women' quality of life post educational intervention, while, there was no significant difference between before and after educational intervention related to diabetic women' satisfaction with their home environment. This finding was agreement with the study of ***Baraz et al.*** which illustrated that there was a significant increase in social functioning dimensions in the post-intervention (P = 0.001). [(33)] In addition, the literature emphasizes that quality of life is the valuable and essential consequence in diabetic patients who has to be routinely evaluated along with educational assessments. However, educational

intervention has a significant positive effect on the QOL of patients with a diabetes mellitus. [35]

CONCLUSION

Educational intervention can improve the knowledge and increase awareness and the QOL of diabetic women. The current research study showed a highly significant improvement in diabetic women' knowledge after educational intervention related to diet management , foot care, symptoms of hyperglycemia, the importance of exercise, and the importance of regular investigation at p≤ 0.001, while, this finding was revealed a significant improvement in the items of diabetes' signs and symptoms of hypoglycemia at p≤ 0.05. Additionally, the study results indicated that educational intervention has a positive impact in the physical, psychological and socio-environmental aspects of diabetic women' quality of life. There are some limitations in the current research study. The first limitation in this study was not using a control group and conducted follow-up only once after the educational intervention. The second limitation was participants of the study were female and in only one government hospital. The third limitation of the study was not targeted toward the attitude and practice of diabetic patients.

RECOMMENDATION

Based on research findings, the study researchers recommend the following; ***1)*** Activate the role of the primary health care centers to participate in making an annual plan for diabetic patients for their education; ***2)*** More programs should be reconstructed to improve the diabetic women' satisfaction with their home environment and diabetic patient's quality of life; ***3)*** Conduct a quasi-experimental study with a control group and effective follow-up to evaluate the effects of educational and training intervention over time. ***4)*** More research studies are conducted to improve the diabetic patients' attitude and practice for controlling and improving their disease and QOL. ***5)*** Implement educational strategies in hospitals and health care centers for controlling of diabetes mellitus and preventing its complications. ***6)*** Generalize intervention study among diabetic patients' male and female in different government and private hospitals.

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