EFFECT OF MOTIVATIONAL INTERVIEWING IN IMPROVEMENT OF DIABETIC KNOWLEDGE of TYPE 2 DIABETIC PATIENTS IN Zagazig UNNIVERSITY HOSPITAL, A RANDOMIZED CONTROL TRIAL

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ABSTRACT

Background: Type 2 diabetes (T2D) incidence has increased rapidly globally during the last two decades. Lifestyle and behavioral factors such as diet, exercise and self-care have an essential role in the prevention and management of T2D. The motivation behind the desire to change is a cornerstone of adopting a healthier lifestyle. Motivational interviewing (MI) is a counseling technique that helps individuals to change rather than just give information.

Methodology: One stage randomized controlled trial to assess the effect of the motivational interviewing intervention. A sample of (210) type 2 diabetic patients were drawn randomly from the diabetes outpatient clinic in Zagazig University Hospital. The patients were randomly allocated into the interventional (105) group who received education using MI counseling, and the control (105) group who received usual medical advice. The patients were assessed from baseline and after 3 months as regard general diabetic Knowledge.

Results: The motivational interview significantly improved the general diabetic knowledge in the interventional group compared to the control group (p<0.001) after 3 months follow-up.

Conclusion: MI has positive effect in improvement of general diabetic knowledge in type 2 diabetic patients.

Key words: Motivational Interviewing (MI), type 2 diabetes, knowledge, health education, Zagazig.

INTRODUCTION

Diabetes Mellitus (DM) presents a high morbidity and mortality, with significant reduction in the quality of life of patients. It is one of the major causes of kidney failure, lower limb amputations, blindness and cardiovascular disease [1]. Health education is one of the strategies that can help reduce the high prevalence of complications in people with DM. Also play a key role by encouraging taking responsibility for and supporting them in the day to day control of their condition [2].

There is a wide range of studied educational interventions, and, to date, no worldwide model that can be standardized and recognized as effective for all patients [3].

Motivational Interviewing is promising counseling strategy in the treatment of lifestyle problems and disease is (MI). Motivational Interviewing is defined as 'a client-centered, directive method for enhancing intrinsic motivation to change by exploring and resolving ambivalence. In contrast to traditional, more paternalistic, counseling

styles, MI gives the patients' knowledge and experiences a central role in finding the best behavior change strategies. The motivation to change should originate from the patient instead of being imposed by the health care professional [4].

Current study aims at assessing the effect of MI counseling style in contrast with traditional medical counseling on improvement of diabetic knowledge of type 2 diabetic patients.

Subjects and methods

One stage randomized controlled study was carried out on a random sample of type 2 diabetic patients attending Diabetic Outpatient Clinic at Zagazig University Hospital from 1ˢᵗ August 2014 to the end of February 2015.

Patients sample:

The study includes (n=210) diabetic patients attending outpatient clinic monthly. The sample size is calculated by using SPSS (Statistical Package for the Social Sciences) program version 16. Parameters used were: relative risk (0.5), confidence interval (95%), power (80%) and difference effect (20%). Through one stage random allocation, they were being divided into two groups: odd number was been an interventional group and even number was been in control group (105 of cases in interventional group subjected to motivational intervention and 105 of cases in the control group subjected to traditional usual counseling).

Inclusion criteria

- Type 2 diabetic patients receiving care from university hospital
- Age from 30–70 years.
- Poorly controlled (HbA1C more than 7.0%).

Exclusion Criteria:

- Known end organ failure patients.
- Patient known to have terminal illness.
- Pregnancy.
- Patient with severe psychiatric disorders or mental retardation.

Data collection tools:

The data were collected by a structured interview questionnaire which consisting of two parts (sociodemographic part and general diabetic knowledge part). The sociodemographic part was self constructed and multiple choice questionnaires covering general diabetic knowledge were developed and modified by using Michigan Diabetes Research and Training Center's Brief Diabetes Knowledge Test [5]. The validation of questionnaire is done by Arabic translation then back English translation and three expert revisions.

Intervention

- **In first visit:**

Baseline data was collected from patients through using of following:

✓ Structured interview questionnaire for two groups.

✓ Application of the diabetes health education message by using MI session for each patient in interventional group which lasting 40-45 minutes for each patient and application of traditional clinical counseling for control group(by direct information giving to the patient).

- **In second visit**

This visit was conducted one month after first one

✓ Application of the diabetes health education message by using MI session.

✓ Application of traditional clinical counseling for control group (by direct giving information).After this visit a phone call was done for each patient in interventional group to offer brief motivational Interviewing counseling.

- **In third visit**

This visit was conducted one month after the second one. Data were being collected for patients in control and interventional groups using structured interview diabetic knowledge assessment questionnaire.

Motivational interviewing (MI): MI was used for behavior change for interventional group only. MI is based on four key principles [6]**:**

1) Express empathy: Active listening to the patient and understanding of the patient's perspective, without judging, criticizing, or blaming.

2) Develop discrepancy: Direct the discussion in a way that the patients perceive gap between their personal goals and their present behavior and the reasons to change their behavior without pressure from the practitioner.

3) Roll with resistance:

- Roll with resistance by reflecting or rephrasing the patient's arguments against change.
- Dealing with ambivalence as normal process for change.
- Increase the patient's participation in problem solving so that the patient is generating solutions rather than receiving solutions offered by the practitioner.

4) Support self-efficacy: Work to encourage confidence in performing change and overcoming barriers.

Data management

The questionnaire of general diabetic knowledge includes seven items about diabetes (definition, causes, symptoms, complications, knowledge of hypoglycemia control, knowledge of follow up and care of diabetic foot) then total score for all items were calculated .The score was assessed for each item of general diabetic knowledge as following:

- Items which had only two choices either correct answer or wrong answer like (what is diabetes?) were coded (1) for correct answer and (0) for wrong answer.
- Items which had multiple choices like (what are complications of diabetes? How to care a diabetic foot?) . All choices were correct and were coded (1) for answer included ≥50% choices of total choices and (0) for answer included <50% choices of total choices.

Summation of total knowledge scores for each group was calculated and median was identified. The cut off points of median for each group was calculated as following:

- Median of interventional group during pre-intervention visit = 9 (3-16).
- Median of control group during pre-intervention visit = 10 (4-16).
- Median of interventional group during post- intervention visit = 25 (20-19).
- Median of control group during post-intervention visit =12(4-6).

Patients who had knowledge score equal or more than median were considered have good knowledge and who had knowledge score less than median were considered have poor knowledge.

Statistical Analysis

1. Descriptive statistics:

Data were represented in tables as frequencies and percentages for both interventional and control group, which were used for data summarization for sociodemographic data.

2. Analytical statistics:

Chi-square test was used for comparisons of qualititative data between interventional group and control group. It was considered statistically significant at p value < 0.05.

Ethical consideration

Written informed consents were delivered from all patients after describing everything about study to them. The study was permitted by the local ethics committee of the institute.

RESULT

The current study revealed that the interventional group and control group were nearly matched.

Table (1): Sociodemographic characteristics of interventional and control groups:

Variable	Interventional group(n=105)		Control group(105)		Z	P
Age (year): mean± SD range	49.27+7.57 (38-65)		50.80+5.34 (40-65)		1.7	0.09
	No	**%**	**No**	**%**	χ^2	**P**
Sex:						
Male	36	43.29	43	40.95	0.99	0.32
Female	69	65.72	62	59.05		
Address:						
Rural	88	83.81	87	82.86	0.03	0.85
Urban	17	16.19	18	17.14		
Occupation:						
Don't work	54	51.43	44	41.91		
Industrial(farmer)	24	22.86	19	18.10	8.63	0.07
Skilled worker	11	10.48	27	25.71		
Semiprofessional	12	1.43	10	9.52		
Professional	4	3.81	5	4.62		
Marital status:					2.84	0.09
Married	92	87.62	99	94.29		
Single*	13	12.38	6	5.71		
Education:						
illiterate	19	18.10	17	16.19	5.47	0.36
read and write	49	46.67	46	43.81		
primary	11	10.48	21	20.00		
intermediate	12	11.43	6	5.71		
secondary	11	10.48	11	10.48		
high	3	2.86	4	3.81		

This table shows that there is no significant difference between interventional and control groups regarding Sociodemographic characteristics.

Table (2): Assessment of general diabetic knowledge among the selected patients for interventional group and control group during first visit (pre-intervention):

Variable	Interventional Group(n=105)		Control group (n=105)		χ^2	P
	No	%	No	%		
Definition:						
Poor	72	68.57	78	74.29	0.84	0.36
Good	33	31.43	27	25.71		
Causes:						
Poor	76	72.38	79	75.24	0.22	0.64
Good	29	27.62	26	24.62		
Symptoms:						
Poor	101	96.19	95	90.48	2.76	0.10
Good	4	3.81	10	9.52		
Complications:						
Poor	55	52.38	53	50.48	0.08	0.78
Good	50	47.62	52	49.53		
Knowledge of hypoglycemia:						
Poor	78	74.29	84	80.00	0.97	0.32
Good	27	25.71	19	26.67		
Knowledge of Follow up:						
Poor	75	71.43	71	67.62	0.36	0.55
Good	30	28.57	34	32.38		
Knowledge of diabetic foot:						
Poor	88	83.81	81	77.14	1.49	0.22
Good	17	16.19	24	22.86		
Total:						
Poor*	71	67.62	61	58.10	2.04	0.15
Good*	34	32.38	44	42.00		

NB:*Poor knowledge is calculated when total score is less than median (median of interventional group=9 and median of control group=10).
    *Good knowledge is calculated when score equal or more than median.
There is no significant difference between interventional group and control group of diabetic patients regarding general diabetic knowledge during first visit.

Table (3): Comparison between interventional group and control group of diabetic patients as regard general diabetic knowledge during post intervention:

Variable	Interventional Group(n=105)		Control group (n=105)		χ²	P
	No	%	No	%		
Definition:						
Poor	12	11.43	75	71.43		
Good	93	88.57	30	28.57	77.88	**0.00***
Causes:						
Poor	13	12.38	53	50.48	35.35	**0.00***
Good	92	287.62	52	49.52		
Symptoms:						
Poor	19	18.10	87	82.86	88.08	**0.00***
Good	86	81.90	18	17.14		
Complication:						
Poor	17	16.19	50	47.62	23.87	**0.00***
Good	88	83.81	55	52.38		
Knowledge of hypoglycemia						
Poor	24	22.86	80	76.19	59.74	**0.00***
Good	81	77.14	25	23.81		
Knowledge of Follow up:						
Poor	15	14.29	59	56.19	40.39	**0.00***
Good	90	85.71	46	43.81		
Knowledge of diabetic foot:						
Poor	31	29.52	79	75.24	43.99	**0.00***
Good	74	70.48	26	24.76		
Total knowledge:						
Poor**	41	39.05	59	56.19	6.19	**0.00***
Good**	64	61.00	46	43.81		

NB:median Poor knowledge is calculated when score is less (median of interventional group=25 and median of control group=12). **Good knowledge is calculated when score equal or more than median.**

There is statistical significant difference   between interventional group and control group of diabetic patients as regard general diabetic knowledge.

Table (4): Relation between general diabetic knowledge and sex and address among diabetic patients in interventional group during post-intervention

	Total Diabetic Knowledge No=105				X^2	P
	poor		good			
	No	%	No	%		
Sex						
Male	15	14.29	21	20.00	0.16	0.69
Female	26	24.76	43	32.38		
Total	41	39.05	64	52.38		
Addre ss Rural	36	34.29	52	49.52	0.79	0.31
	5	4.76	12	11.43		
Urban						
Total	41	39.05	64	60.95		

This table shows that no significant difference between total diabetic knowledge and age and sex among diabetic patients.

Table (5): Relation between general diabetic knowledge and education and occupation among diabetic patients in interventional group during post-intervention.

	Total Diabetic Knowledge No=105				Fisher exact	p
	poor		Good			
	No	%	No	%		
Education						
illitrate	14	13.33	5	4.76		
read and write	14	13.33	35	33.33	23.79	**0.00***
primary	0	0.00	11	10.48		
intermediate	7	6.67	5	4.76		
secondary	6	5.71	5	4.76		
high	0	0.00	3	2.86		
Total	41	39.04	64	60.95		
Occupation						
No work	20	19.05	34	32.38	15.23	**0.00***
Farmer	14	13.33	10	9.52		
Worker	0	0.00	11	10.48		
Semiprofessional	7	6.67	5	4.76		
professional	0	0.00	4	3.81		
Total	41	39.05	64	60.95		

This table shows that there significant difference between total diabetic knowledge and education and occupation among diabetic patients.

DISCUSSION

In the current study there was no significant difference between interventional group and control group as regard general diabetic knowledge during first visit as shown in **(Table 2)**, and they showed poor knowledge in both groups in all items including definition, causes, symptoms, complications, knowledge about hypoglycemia, follow up and foot care.

Regarding the patient knowledge assessment during post intervention the current study revealed a significant improvement in the knowledge of the interventional group towards diabetes with P value <0.00 in all items **(Table 3)**.

Regarding the relation between total diabetic knowledge and sociodemographic data of interventional group during post-intervention there were no significant difference as regard sex and address **(Table 4)** but there were significant difference between total diabetic knowledge and education and occupation **(Table 5)**.That mean the improvement in knowledge did not only due to intervention but there are confounding factors like occupation and education.So,further studies are needed to exclude these confounding in role of motivational interviewing in improvement of diabetic knowledge.

That can be due Motivational Interviewing is intended to discover ambivalence and stimulate motivation for change. MI is one of empowering approaches that described as the improvement of confidence of individuals in their own abilities. So, this approach provides patients with knowledge, skills, and responsibility to make changes in their behavior [7].

The current study results is supported by **Hawkins 2010** conducted study on 66 patients with uncontrolled diabetes who were gave videophone Motivational Interviewing as part of diabetes self-management education and they showed improvement in their diabetes knowledge, HbA1c and diabetes self-efficacy compared to patients who received healthy-lifestyle education calls[8].

There were many studies which revealed the effect of diabetic health education on improvement of knowledge. **Wallace et al.2009** studied the effect of offering patients with a literacy-appropriate diabetes education guide together with an first brief individual counseling session (lasting < 15 minutes) and two follow-up telephone counseling sessions at 2 and 4 weeks and then they found that diabetes knowledge had improved when 3 months measured after the intervention [9].Also, there were many studies have shown the positive impact of the educational process on diabetes, with the meta-analysis finding that patients present glycemic control improvements, and prevention and control of the acute and chronic complications, when they be given effective treatment, self-management support and regular monitoring[10]. Other authors also describe self-care education as the process of knowledge and skills expansion that engage bodily, dietary, therapeutic and other practices done by the patient, to improve metabolic control and quality of life at a reasonable cost. This process collect the needs, goals and life experiences of people with diabetes and is guided by evidence-based standards. [11] [12].

CONCLUSION

This controlled study showed that MI diabetes education approach had significant positive effect on diabetic patient's knowledge compared to traditional health education.

Limitation

There was constrain beyond capacity in the current study to exclude other sources of education for diabetic patients included in this study and propose further studies using of this counseling approach can be of help for diabetic health promotion strategies improvement.

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