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Diabetes 2018: Risk Reduction Intervention to Reduce Risk of Type II Diabetes Mellitus at High Risk People in a Rural Area - Naglaa E L Mokadem and Rehab Taman- Menoufia University

Naglaa E L Mokadem and Rehab Taman

Menoufia University

Abstract

Type II Diabetes Mellitus (DM) is a growing public-health burden worldwide, particularly in developing countries. Lifestyle modification can prevent or delay the onset of type II DM at high-risk adults. Most lifestyle intervention findings are driven from western studies which might not be appropriate for different cultures. Culturally sensitive interventions tailored to meet the specific needs of people in a rural area will facilitate the implementation and sustainability of behavior changes. The purpose of this study was to examine the effects of risk reduction intervention to reduce type II Diabetes Mellitus at high risk people in a rural area. A quasi experimental (Pre/post-test) design was used. A convenience sample of 70 patients with one or more risk factors of type II DM was recruited. This study was conducted at the outpatient clinics of Menoufia University Hospital at Shebein El- Kom City, Menofia Governorate, Egypt. Tools including: semi-structured demographic data sheet, The Australian Type II Diabetes Risk Assessment Tool and 24 Hours Dietary Recall Sheet. Culturally sensitive risk reduction intervention was tailored to meet the specific needs of at high risk people in the designated rural area. There was a statically significant difference in type II diabetes risk score pre and post intervention in the study group with a p value < 0.001. The lifestyle of people in developing country is different from industrialized developed countries, thus, developing preventive strategies to promote healthy lifestyles that are culturally appropriate and tailored for illiterate people with low socioeconomic status is crucial.

Results

Characteristics of the Sample

The mean age of the participants in the control group was 37.85 ± 10.94 years old and the mean age of the participants in the study group was 43.02 ± 10.81. The majority of participants (88.6%, 80%) were female in both control and study group respectively and most of them (80%) were married in both groups. Concerning the educational level of the participants in the study group 51.4% were secondary school and 51.43% in the control group were university graduates and the majority of participants were working 85.7%, 80% in both groups. As regard to the monthly income of participants 62.86%, 54.29% of participants in control and study group respectively were enough and this determined from the patient's perception. See table 1.

Variables	Control Group (n = 35)		Study Group
	No	%	No
Age (years)			
< 35	5	14.3	12
35-45	13	37.1	11
45-55	13	37.1	11
55-64	4	11.4	1
Age (Mean ± SD)	37.85 ± 10.94		43.02 ± 1
Sex			
Female	31	88.6	28
Male	4	11.4	7
Residence			
Urban	15	42.9	9
Rural	20	57.1	26
Marital Status			
Single	4	11.4	6
Married	28	80.0	28
Widower/Divorced	3	8.57	1
Educational Level			
Illiterate	2	5.8	5
Secondary	15	42.9	18
University	18	51.43	12
Occupation			
Working	30	85.7	28
Not working	5	14.3	7
Monthly Income			
Not enough	13	37.16	16
Enough	22	62.86	19

Table 1: Characteristics of Study Sample for Control and Study Groups

Type II Diabetes Risk Score Post Intervention

There was a statistically significant difference in type II diabetes risk score post lifestyle modification intervention between control and study group, which indicating that the lifestyle modification intervention was effective in reducing type II Diabetes risk scores at high risk people. See table 2.

Type II Diabetes Risk Score	Controls (n = 35)		Study group (n = 35)	
	No	%	No	%
Pre intervention				
Low	0	0.0	0	0.0
Intermediate	6	17.1	11	31.4
High	29	82.9	24	68.6
Post intervention				
Low	0	0.0	10	28.6
Intermediate	5	14.3	12	34.3
High	30	85.7	13	37.1
Mean ± SD of risk score Pre intervention	16.08 ± 4.39		15.22 ± 3.72	
Mean ± SD of risk score Post intervention	16.08± 4.39		10.88 ± 5.0	

Table 2: Effect of Risk Reduction Intervention on Type II Diabetes Risk Score Post Intervention

Limitations of the Study

The findings of the current study should be interpreted with caution because of the bias associated with using the convenient sample, whereas lack of random sampling may contribute to sample selection bias and limits the generalization of the findings. Another limitations are the recruitment of the participants from a single setting (Menoufia University Teaching Hospital) and the relatively small sample size. Final limitation is using self-reported questionnaire to measure physical activity level, whereas possible reactivity in completing the questionnaire in a socially desirable direction can occur.

Discussion

The findings of the present study provide convincing evidence that lifestyle modification intervention is feasible in people at high risk for type II Diabetes in a rural area with a significant reduction in type II diabetes risk scores. The results from the present study confirm that significant changes can be obtained in BMI, physical activity level, fat, carbohydrates, protein consumption and total kilo calories per day. The current study hypothesized that patients who will receive risk reduction interventions are more likely to have decreased risk score for type II Diabetes Mellitus than who didn't receive the lifestyle modification intervention. The present study findings supported the study hypothesis and revealed that there was a statistically significant reduction in type II Diabetes Mellitus risk score observed post intervention compared with pre-

intervention. The findings of the current study found that type II Diabetes risk score was reduced by 60% post intervention compared with pre intervention which are similar to what was reported by Nield., et al. [8] who studied the effect of intensive lifestyle intervention on reducing type II Diabetes and found that, there was a significant statistical decrease of type II Diabetes risk score by over half post intervention than pre intervention. The findings of the current study are also similar to the Finnish Diabetes Prevention Program who reported that the modification of lifestyle reduced the incidence of type II diabetes by 58 percent during 3.2 years of follow-up among 522 middle-aged, overweight participants with impaired glucose tolerance [9]. Also, results from the first three years of the Diabetes Prevention Program in the United States showed that regular exercise and the modification of diet reduced the incidence of type II diabetes by 58 percent among patients with impaired glucose tolerance [10]. However, findings of the current study are different from what was reported by Orozco., et al. [11] who studied the efficacy of lifestyle interventions to prevent type II Diabetes Mellitus and found that there were no significant effects noted post intervention.

Conclusion and Recommendations

The study findings suggest that risk reduction intervention has led to improvement in dietary habits and physical activity of participants.

• Encouraging individuals at risk for diabetes to increase their physical activity daily and explain the benefits of exercise in increasing insulin sensitivity.

• Prepare programs about the importance of maintaining healthy body weight through following a healthy diet, performing physical activity and being active all the time to protect people from many chronic diseases including diabetes and make these programs free and available for public.

• Designing simple booklets about healthy diets with adequate calorie intake per day and an examples of calculating healthy meals and healthy food choices and distribute it at the out-patient clinics to benefit individuals at risk for type II Diabetes Mellitus.

• Replication of this study is recommended with several design changes such as, using a large sample size; using of randomized selection to achieve appropriate representation of the population; and conducting the study in a larger scale to include multicenter. The study period should be extended more than three months. Extending the follow-up period will provide more comprehensive information about the effect of lifestyle modification intervention on reducing risk score of type II Diabetes among high risk people.

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