

Effect of Education on Improvement of Quality of Life by SF-20 in Type 2 Diabetic Patients

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ABSTRACT

Aim: to improve the HRQOL of type 2 diabetes patients with health education and identify factors which may be associated with the QOL to decrease the complications of them.

Methods: the subjects in the present study were type 2 diabetes patients with range 25-75 years old. Hundred and twenty individuals were randomly selected from the list of the referee patients of the Diabetic Research patients of Yazd. They were divided into two groups: case group (60 persons) and control group (60 persons). The health related quality of life was measured with SF-20 questionnaire. The education as intervention factor was performed using face-to-face and group teaching methods to case group. All data which were collected before and after intervention (two months after education) were transferred directly into SPSS. For data analysis, Chi-square, t test were used.

Results: the mean duration of diabetes of patients was 9.87 (SD=7.2) years. As much as 8.3% patients managed diabetes by diet only, while 84.4% and 7.3% were taking oral hypoglycemic agents and insulin respectively. About 72.4% of patients had neuropathy, and 66% retinopathy. Intervention caused an increase in scores of the six dimensions and QOL of case group after intervention. There was significant difference between the scores of four dimensions of SF-20 and QOL of case and control groups after intervention ($P= 0.000-0.007$).

Conclusion: diabetes requires the patients to self-manage their disease and is a lifetime struggle to maintain and increase QOL. Treatment plans that inherently improve or include strategies to enhance patients' QOL may increase compliance, thereby improving these patients' metabolic status.

Key words: diabetes, SF-20, QOL, education, type 2 DM.

INTRODUCTION

Diabetes is a complex disorder associated with several potentially preventable disabilities, such as blindness, amputation, neuropathy, retinopathy and cardiovascular disease.¹ Type 2 diabetes is the most common metabolic disorder that patients suffer from symptoms of hyperglycemia and diabetic complications.² Diabetes related morbidity and premature mortality impose a sizeable burden on individuals with diabetes and on society, signifying a major public health concern.³ The incidence of diabetes is increasing and the prevalence of diabetes is approaching epidemic proportion in many developing countries in Middle East including Iran. The prevalence of type 2 diabetes in Iran is 4-4.5% and in population aged above 30 years is greater than 14%. The incidence and prevalence of diabetes vary in different areas of Iran, so the prevalence of type 2 diabetes in Yazd is higher than other province of Iran.^{4,5} Diabetes is 5th reason of death in Europe and about 15% of financial cost to the public health services in USA is for diabetes. WHO estimates that the prevalence rate of diabetes (4% in 1995) will increase to 5.6% in 2025.⁵

Dietary restriction, medication, the actual symptoms of diabetes and concomitant diseases may lead to deterioration in the Health-Related Quality of Life (HQOL).²

Diabetes as a chronic disease requires medical care and education to prevent acute and long term complications.^{6,7} QOL was defined as "The perception of individuals or groups that their needs are being fulfilled and that they are not being denied opportunities to achieve happiness and satisfaction". QOL is considered as a multidimensional entity incorporating both a cognitive component (satisfaction) and an emotional

component (happiness).⁸

The results of the studies have shown that type 2 diabetes is associated with impaired HRQOL. Type 2 diabetes itself seemed to impair all dimensions of HRQOL, except mental health and pain in the Medical Outcomes study.⁹ In most studies, HRQOL was associated with hyperglycemia,⁹⁻¹¹ insulin treatment,¹¹⁻¹⁴ duration of diabetes,¹¹⁻¹⁴ age,^{11, 14, 15} female gender,^{15-16, 11} diabetic complications^{11, 14} and concomitant diseases.^{11, 13} In some studies, no relationship was found between HRQOL and hyperglycemia, duration of diabetes, type of treatment and diabetic complications.^{16, 17}

Finally the guidelines for treatment and prevention of type 2 diabetes emphasize that one of the primary objectives of treatment and secondary prevention is to improve the patient's HRQOL.² Improvement of HRQOL is likely to be the principle outcome of interventions to prevent or treat some complications of type 2 diabetes.¹⁸ The improvement in QOL not only benefits the patients but also reduces the health care cost related to readmission.¹⁶ It is possible to compare the HRQOL of the chronically ill with the healthy population by using a general measure. It is needed to know more about QOL among individuals with diabetes and about patient profile, disease status, and health care system and socio-environmental characteristics that put people at risk of decreased QOL.¹⁹ The aim of the present study was to improve the HRQOL of type 2 diabetes patients with health education and identify factors which may be associated with the QOL to decrease the complications of them.

METHODS

The subjects in this study were type 2 diabetes patients with range 25-75 years old, living in the area served by the Diabetic Research Center of Yazd, Iran. The type 2 diabetes patients were identified according to WHO criteria. In total, 120 individuals were randomly selected from the list of the referee patients of the Diabetic Research patients of Yazd based on date of admission. They were divided into two groups: case group (60 persons) and control group (60 persons) alternately.

Information on demographic and clinical characteristics such as height, weight and smoking status were collected together with information on preexisting medical conditions.

The health related quality of life was measured with a self-administrated short-form questionnaire of Medical Outcomes study (SF-20). The SF-20 measure has three dimensions both for functioning (physical, social and role) and for well-being (mental health, health

perception and pain). It yields six numerical scores (0-100) for each parameter such that a higher score indicates better functioning or wellbeing. The only exception is pain: A higher score indicates more pain. The SF-20 has been validated in American and Finnish adult population.^{20, 21} The Finnish version of SF-20 has been translated by the Finnish National Health Institute that we translated it to Farsi. To ensure the clarity of questionnaires, pilot testing of the questionnaire was also performed using the coherence and consistency upon 10 diabetic patients who were not included in the survey.

Then after, the questionnaire was modified on the basis of their feedback. Content validity was established by 5 experts who were academic staff or endocrinologists. To determine the internal reliability, a Cronbach's alpha was calculated 0.79. Physical functioning is measured with items 3-8, role functioning with 9 and 10, social functioning with 11, mental health with 12-16, health perception with 1 and 17-20 and physical pain with item 2 (the 20 items are presented in Appendix A and the scores for each parameter have been calculated). Data were collected by a questionnaire in case and control groups before and after intervention by interview, in waiting room of clinic of diabetes. The patients were asked to have a clinical examination and laboratory tests to evaluate the diabetic complications, and standard laboratory tests were applied. Background data (age, gender, duration of diabetes, type of treatment) were collected from patient records and by structured interview.

The education as intervention factor was performed using face-to-face and group teaching methods to case group in two, one hour, sessions by an endocrinologist, a nutritionist and a health educationist. We used Power point, overhead and pamphlets for education of patients. Control group received only usual care. All data which were collected before and after intervention (two months after education) were transferred directly into SPSS (Statistical Package for Social Sciences). For data analysis, Chi-square, t-test were used and level of confidence interval was 95%.

We obtained informed consent from all participants; in addition, the participants were assured that their responses were confidential.

RESULTS

Socio-demographic and clinical characteristics: The age of 40% of participants was lower than 50 years old (25-50 years), and 60% more than 50 years old (50-75 years), males constituted 41.23%, about 29.8% were

illiterate and 45.6% completed 8 years of education. The mean duration of diabetes of patients was 9.87 (SD=7.2) years. As many as 8.3% patients managed diabetes by diet only, while 84.4% and 7.3% were taking oral hypoglycemic agents and insulin respectively. About 72.4% of patients had neuropathy, and 66% retinopathy.

In table 1, the mean SF-20 scores of participant in case and control groups, before and after intervention are presented for the entire study populations and subgroups and scores of quality of life. The results of this table shows, Intervention caused an increase in scores of the six dimensions and QOL of case group after intervention. The differences were remarkable. There was significant difference between three dimension of SF-20 and QOL of patients of case group before and after intervention (P= 0.001). The QOL of case group before intervention was 49.98(SD=14.6) out of 100, that increased to 60.49 (SD=16.4) after intervention. There was no significant difference between the scores of dimensions of SF-20 and QOL of control group, before and after intervention. The QOL of control group, before intervention was 52.1 (SD=19.5) out of 100, after intervention decreased to 51.04 (16.4).There was significant difference between the scores of four dimensions of SF-20 and QOL of case and control groups after intervention (P=0.000- 0.007).

The data in table 2, shows, we can improve the complications of diabetes that effect on the dimensions of SF-20 and QOL of patients by education. The QOL

of patients in the case group with retinopathy and neuropathy, before intervention was 46.27 (14.58) and 46.64 (14.5) respectively, increased to 58.58 (19.44) and 58.9 (18.27) after intervention. Sport, can increase the QOL of patients, The QOL of patients, who did sport, before intervention was 55.33 (12.58), increased to 67.61 (14.87) after intervention.

The scores of dimension of SF-20 and QOL of males and females is presented in table 3. There was no significant difference between the dimensions of SF-20 and QOL of males and females, before intervention, but there was significant difference between four dimensions of SF-20 and QOL of them after intervention. The mean scores of dimensions of SF-20 and QOL of males increased more than females after intervention.

Appendix A shows the distributions of answers to the SF-20 items and QOL of case group, before and after intervention. In all items, after intervention, participants replied that they were doing better than the corresponding answers, before intervention. A remarkable difference between distributions of answers was found in questions 12 and 17, which concerned mental functioning and health perceptions well being: before intervention 36.7% of patients in case group were all the time nervous, after intervention decreased to 1.7%. in question 17, before intervention, 62.7% of patients in case group were definitely ill, in after intervention, the decreased to 6,7%.

Table 1. The Mean (SD) Scores and P-value of HRQOL of Case and Control Group, Before and After Intervention

	Function				Well-being		
	Physical	Role	Social	Mental	Health perception	Pain	Quality of life
Entire study population							
Case							
Before intervention	60.27 (21.5)	38.8 (43.57)	42.4 (32.8)	43.52 (18.36)	55.68 (13.96)	57.2 (27.8)	49.98 (14.6)
After intervention	73.26 (22.6)	63.8 (41.66)	51.8 (26.8)	48.84 (17.72)	57 (14.68)	41 (24)	60.49 (16.4)
p-value	< 0.001	< 0.001	< 0.052	= 0.142	= 0.158	< 0.001	< 0.001
Control							
Before intervention	69.2 (25.86)	40.66 (46.28)	48.8 (34.2)	41.28 (17.84)	47.92 (14.96)	42.6 (27.2)	52.1 (19.5)
After intervention	68.6 (26.6)	35.2 (44.5)	46 (32.8)	42.88 (16.6)	48.24 (14.92)	43.8 (28.2)	51.04 (16.4)
p-value	= 0.818	= 0.093	= 0.347	= 0.564	= 0.53	= 0.594	= 0.615
Case							
Before intervention	60.27 (21.5)	38.8 (43.57)	42.4 (32.9)	41.28 (17.84)	47.92 (14.96)	42.6 (27.2)	52.1 (19.5)
p-value	= 0.042	= 0.824	= 0.276	= 0.507	= 0.038	= 0.005	= 0.518
Case							
After intervention	73.26 (22.6)	63.8 (41.66)	51.8 (26.8)	48.8 (17.72)	57 (14.68)	41 (24)	60.49 (16.84)
Control							
After intervention	68.6 (26.6)	35.2 (44.5)	46 (32.8)	42.88 (16.6)	48.24 (14.92)	43.8 (28.2)	51.4 (16.4)
p-value	< 0.001	< 0.001	= 0.086	< 0.001	0.002	= 0.724	< 0.007

Table 2. The Mean (SD) Scores of Some Related Factors on HRQOL in Case Group, Before and After Intervention

	Function				Well-being		
	Physical	Role	Social	Mental	Health perception	Pain	Quality of life
Retinopathy							
Before intervention							
Yes	59.9 (23.07)	26.5 (40.49)	36.8 (31.4)	39.24 (16.96)	51.28 (14.8)	60 (28.2)	46.27 (14.58)
No	61.1 (23.3)	59.52 (40.68)	49.6 (33.2)	50.8 (17.6)	57.32 (11.26)	54.4 (27.2)	55.75 (12.07)
p-value	= 0.842	< 0.004	= 0.151	< 0.019	= 0.118	= 0.468	< 0.018
After intervention							
Yes	69.9 (24.83)	56.94 (43.4)	51.66 (28.8)	49.88 (19.6)	55.64 (15.6)	51.4 (25)	58.58 (19.44)
No	79.4 (15.73)	76.2 (12.5)	54.4 (23.2)	48.2 (14.04)	60.36 (11.88)	34.6 (22.4)	64.58 (11.33)
p-value	= 0.122	= 0.084	= 0.822	= 0.732	= 0.238	< 0.011	< 0.01
Neuropathy							
Before intervention							
Yes	58.8 (23.56)	33.75 (42.94)	35.6 (32.6)	40.12 (17.52)	50.12 (13.84)	61.2 (27.8)	46.64 (14.5)
No	74.1 (23.73)	77.8 (35.2)	52.4 (25.8)	48.76 (14.16)	61.76 (12.6)	35 (21.6)	65.25 (12.32)
p-value	= 0.411	= 0.221	< 0.038	< 0.038	< 0.007	= 0.395	< 0.016
After intervention							
Yes	73.1 (21.83)	57.7 (43.73)	52.2 (27.4)	49.44 (18.96)	55.36 (14.88)	53.4 (26.6)	58.9 (18.27)
No	74.1 (23.73)	77.8 (35.2)	52.4 (25.8)	48.76 (14.16)	61.76 (12.6)	35 (21.6)	65.25 (12.32)
p-value	= 0.877	= 0.093	= 0.991	= 0.897	= 0.121	< 0.007	< 0.019
Sport							
Before intervention							
Yes	67.3 (18.2)	50.74 (44.02)	50.4 (33)	50.24 (14)	56.48 (12.6)	53 (27.6)	55.33 (12.58)
No	54.17 (22.8)	26.87 (39.95)	37.36 (31)	37.36 (19.16)	50.92 (14.84)	63 (28.2)	45.07 (14.55)
p-value	< 0.019	< 0.033	< 0.062	< 0.07	= 0.146	= 0.175	< 0.009
After intervention							
Yes	79.5 (17.2)	84.61(30.86)	63.8 (23.4)	53.68 (19.04)	62.16 (16.05)	38.8 (25.2)	67.61 (14.87)
No	68.3 (24.87)	45.16 (41.54)	42.6 (25.6)	44.68 (15.84)	52.8 (12.2)	43.6 (23.6)	54.07 (16.42)
p-value	< 0.057	< 0.001	< 0.002	< 0.061	< 0.016	= 0.443	< 0.003

Table 3. The Mean (SD) Scores and P-value of HRQOL of Case and Control Group, Before and After Intervention Related to Sex

Dominated of SF-20	Sex	Before intervention			After intervention		
		Male	Female	p-value	Male	Female	p-value
Physical		64.87(20.47)	56.27(21.9)	=0.122	83.93(14.23)	63.97(23.6)	<0.000
Role		40(44.14)	37.81(43.75)	=0.848	62.96(42.95)	64.52(41.22)	=0.889
Social		42.8(36.4)	41.8(29.8)	=0.909	60(28.8)	44.6(23)	<0.027
Mental		43.4(18.08)	43.6(18.92)	=0.967	56.6(19)	41.52(13.04)	<0.001
Health perception		55(13.68)	52.52(14.24)	=0.511	61.68(15.48)	53.04(12.92)	<0.025
Pain		61.4(26.6)	53.6(29)	=0.284	40.8(23.4)	41.2(25.4)	=0.933
Quality of life		52.21(15.77)	48.26(13.69)	=0.325	66.36(17.34)	55.6(15)	<0.017

DISCUSSION

Diabetes requires the patients to self-manage their disease and is a lifetime struggle to maintain and increase QOL. Treatment plans that inherently improve or include strategies to enhance patients' QOL may increase compliance, thereby improving these patients' metabolic status.^{14,22} If one of the goals of health care is to improve QOL, then it seems important to understand how diabetes affects QOL¹ and how we can control diabetes and increase the QOL. Indeed, one rationale for including QOL assessment in clinical trials is to

provide patients with information and skills to help them choose treatment strategies consistent with lifestyles. We report here the effect of health education, as an intervention factor to QOL, with using SF-20 questionnaire. In the present study, the HRQOL was studied in type 2 diabetes patients with range 25-75 years old. These results indicate that health education have an impact on all of the quality of life measures. The participants in this study suffered major impairment in all aspects of quality of life, before intervention compared with after intervention. The results of table 1

shows, Intervention caused an increase in scores of the six dimensions and QOL of case group after intervention. The differences were remarkable. There was significant difference between three dimension of SF- 20 and QOL of patients of case group before and after intervention ($P= 0.001$).

The findings of this study are consistent with the observations of Bockting et al, who described the increase of AIDS knowledge after intervention²³ and the finding of Tan et al., who found that the HbA_{1C} in diabetic patients declined when their awareness increased.²⁴ The increase of awareness in this study is also consistent with the finding of Lin et al, who observed the change and improvement of behavior of individual in vaccination rate of HB,²⁵ and the finding of Baghianimoghadam, who found the intervention basis on constructs of Health Belief Model (HBM) improved in the practice of hairdressers for prevention of HB in their clients. The practice of hairdressers led to the improvement of the condition of barbers and the prevention of HB in their clients.²⁶

In general, several studies support the results of present study. The results of a clinical trial study in England show that, increase of knowledge of diabetic patients, controlled their diabetic complication²⁷ and data of a study in Iran revealed that, increasing the knowledge of diabetic patients, decreased their HbA_{1C}.²⁸

The impact of diabetic complications on HRQOL was Retinopathy and neuropathy. The QOL and all of dimensions of SF-20 in patients with retinopathy and neuropathy was lower than patients without these complications. These results don't support the results of study that carried out by Jouko Hanninen et al. He showed that retinopathy and neuropathy had no impact on HRQOL of patients.²⁹ But supports the results of Ensaf Saied³⁰ and Jacobson et al.¹⁵ They revealed that: QOL was lower among patient with diabetes complications.

In present study the patients who did sports had significantly higher QOL and increased their QOL after intervention. The SF-20 questionnaire was easy to use and most patients had no difficulties in completing it in a few minutes. It seemed to be sufficiently sensitive to detect difference among diabetic patients and can show the increase of QOL after intervention and it is feasible for use in primary health care.

CONCLUSION

Impairments in all dimensions of HRQOL compared in before and after intervention. Predictors of impaired

HRQOL were the existence of retinopathy and insulin treatment. To improve HRQOL in type 2 diabetes patients, it is the most important to educate them and prevent complications of diabetes. It should be noticed in patient education, the diabetic related factors that impact the HRQOL.

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