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

*Baghianimoghadam Mohammad Hossien and Afkhami-Ardekani Mohammad*

Diabetes Research Center, Shahid Sadoughi University of Medical Sciences, Yazd, Iran

**Abstract:** Diabetes is a complex disorder associated with several potentially preventable disabilities, such as blindness, amputation, neuropathy, retinopathy and cardiovascular disease.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 2diabetes 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 2diabetes in Yazd is higher than other provinces of Iran. The subjects in the present study were type 2diabetes patients with range 25-75 years old. 120 individuals were randomly selected from the list of the referee patients of the Diabetes Research center of Yard. They were divided into two groups: case group (60persons) 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 and…were used. The mean duration of diabetes of patients was 9.87(SD=7.2) years.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 Quality of life 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). 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:** Type 2 diabetes · SF-20 · Quality of life (QOL) · Education

## 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 2diabetes 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 2diabetes 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 (HEQOL) [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].

**Corresponding Author:** Dr. Mohammad Afkhami-Ardekani, Diabetes Research Center, Jomhoori Blvd, Yazd, I.R. Iran

The results of the studies have shown that type 2diabetes is associated with impaired HRQOL. Type 2diabetes itself seemed to impair all dimension 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]. Durationofdiabetes [11-14], age [11, 14-15], female gender [11, 15, 16], 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 2diabetes emphasize that one of the primary objectives of treatment and secondary prevention is to improve the patient's HRQOL [2]. Improvement of HRQOL are likely to be the principle outcome of interventions to prevent or treat some complications of type 2diabetes [18]. The improvement in QOL not only benefits the patients but also reduces the health care cost related to readmission16. 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 2diabetes patients with health education and identify factors which may be associated with the QOL to decrease the complications of them.

## MATERIALS AND METHODS

The subjects in this study were type 2diabetes patients with range 25-75 years old, living in the area served by the Diabetic Research Center of Yazd, Iran. The type 2diabetes 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. They were divided into two groups: case group (60persons) and control group (60 persons).

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-administered 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. 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 endocrinologist. 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 with1 and 17-20and 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 samples 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. 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 and…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 8years of education. The mean duration of diabetes of patients was 9.87(SD=7.2)

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) | 57.00 (14.68) | 41.0(24.0) | 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) | 46.0(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(32.8) | 43.52(18.36) | 55.68(13.96) | 57.2(27.8) | 49.98(14.6) |
| 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) |
| 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) | 57.0(14.68) | 41.0(24) | 60.49(16.84) |
| Control | | | | | | | |
| After intervention | 68.6(26.6) | 35.2(44.5) | 46.0(32.8) | 42.88(16.6) | 48.24(14.92) | 43.8(28.2) | 51.4(16.4) |
| P-value | <0.001 | < 0.000 | =0.086 | <0.000 | 0.002 | =0.724 | <0.007 |

*Health related quality of life

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) | 60.0(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 | 79.36(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 | 58.76(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 | 63.9(17.4) | 48.89(43.37) | 54.4(29) | 50.84(16.96) | 60.68(11.16) | 54.4(27.6) | 56.65(11.66) |
| P-value | =0.411 | =0.221 | <0.038 | <0.038 | <0.007 | =0.395 | <0.016 |
| After intervention | | | | | | | |
| Yes | 73.06(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 | 74.07(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 | <0.007 | =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 | 68.27(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 |

*Health-Related-Quality Of Life

Table 3: The mean (SD) scores and P-value of HRQOL* of case and control

| Dominate 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 | 40.0(44.14) | 37.81(43.75) | =0.848 | 62.96(42.95 | 64.52(41.22) | =0.889 |
| Social | 42.8(36.4) | 41.80(29.8) | =0.909 | 60.0(28.8) | 44.60(23) | <0.027 |
| Mental | 43.4(18.08) | 43.60(18.92) | =0.967 | 56.6(19) | 41.52(13.04) | <0.001 |
| Health perception | 55.0(13.68) | 52.52(14.24) | =0.511 | 61.68(15.48) | 53.04(12.92)0 | <0.025 |
| Pain | 61.4(26.6) | 53.60(29) | =0.284 | 40.8(23.4) | 41.20(25.4) | =0.933 |
| Quality of life | 52.21(15.77) | 48.26(13.69) | =0.325 | 66.36(17.34) | 55.60(15)0 | <.017 |

*Health-Related-Quality Of Life    Group, before and after intervention related to sex.

years.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 0f 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.s7%.

## 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 QOL [1] 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 type2 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 intervention [23] and the finding of Tan *et al*., who found that the HbA $_1$C 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 0f 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 complication [27] and data of a study in Iran revealed that, increasing the knowledge of diabetic patients, decreased their HbA$_1$C [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 Saied [30] 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.

## CONCLUSIONS

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 2diabetes 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.

## REFERENCES

1. Krein, S.L. and M.L. Klamerus, 2000. Michigan diabetics research networks; A public health approach to strengthening diabetes, Journal of Community Health, 25 (6): 495-511.

2. Gries, FA. and K.G.M.M. Alberti, 1987. Management of Non-Insulin-Dependent Diabetes Mellitus in Europe. A consensus statement, IDF Bull., 32: 169-174.

3. Wu, S.Y., F. Sainfort, R.H. Tomar, J.L. Tollios, D.G. Fryback, R. Klein *et al*., 1998. Development and application of a model to estimate the impact of type 1 diabtes on health related quality of life. Diabetes Care, 21 (5): 725-7s31.

4. Afkhami-Ardekani, M. and S. Vahidi, 2001. The prevalence of type 2 diabetes mellitus on age of 30 years and above in Yazd province (Iranian population). Journal of Shahid Sadoughi University of Medical Sciences and Health Services, 9 (1): 22-27.

5. Baghianimoghadam, M.H., M. Afkhami Ardekani and S.S. Mazloomy, 2007. Asurvey about the quality of life of type 2 diabetic patients, Journal of Shahid Sadoughi University of Medical Sciences and Health Services, 14 (4): 49-54.

6. Roman, S.H. and M.I. Harris, 1977. Management of diabetes mellitus from a public health perspective. Endocrinal Metab Clin North Am., 26: 443-474.

7. Mensing, C., J. Boucher, M. Cypress, K. Weinger, K. Mulcahy, P. Barta, *et al*. 2007. National standards of diabetes self-management education. Diabetes Care, 30 (supplement1): 96-103.

8. Green, L.W. and M.W. Kreuter, 1999. Health promotion planning.An educational and ecological approach, 3$^{rd}$ ed. London: Mayfield publishing Co.,54.

9.  Stewart, A.L., S. Greenfield, R.D. Hays, K. Wells, W.H. Rogers, S.D. Berry, *et al*. 1989. Functional status and well-being of patients with chronic condition. J. Am. Med. Assoc., 262(7): 907-913.

10. Mayou, R., B. Bryant and R. Tyrner, 1990. Quality of life in Non-Insulin-Dependent Diabetes and a comparison with Insulin-Dependent Diabetes. J. PSYCHOSOM. Res., 34(1): 1-11.

11. Mannucci, E., G. Bardini, V. Ricca and G.M. Rottella, 1997. Predictors of diabetes-related quality of life, Dialectologia, 40: A640.

12. Anderson, R.M., J.T. Fitzgerald, K. Wisdom, W.K. Davis and R.G. Hiss, 1997. Acomparrison of global versus disease-specific quality of life measures in patients with NIDDM, Diabetes Care., 20 (3): 299-305.

13. Keinanen-Kiukaanniemi, S., A. Ohinmaa, H. Pajunpaa and P. Koivukangas, 1996. Health related quality of life in diabetes patients measured by the Nottingham Health Profile. Diabetic Med., 13: 382-388.

14. Jacobson, A.M., M.de Groot and J.A. Samson, 1994. The evaluation of two measures of quality of life in patients with type 1 and type 2 diabetes, Diabetes Care, 17 (4): 267-274.

15. Glasgow, R.E., L. Ruggiero, E.G. Eakin, J. Dryfoos and L. Chobanian, 1997. Quality of life and associated characteristics in a large national sample of adults with diabetes. Diabetes Care, 20 (4): 562-567.

16. Wredling, R., J. Stalhammar, U. andamson, C. berne, Y. Larsson and J. Ostman, 1995. Well-being and treatment satisfaction in adults with diabetes: A Swedish population based study, Qual, life Res., 4 (6): 515-522.

17. Weinberger, M., M.S. Kirkman, G.P. Samsa, P.A. Cowper, E.A. Shortliffe, D.L. Simel, *et al*. 1994. The relationship between glycemik control and health-relation quality of life in patients with non-insulin-dependet diabetes mellitus. Med, Cre 32 (12): 1173-1181.

18. Philip, M., Clarke, Judit Simon, Carole Cull, R. Rury and Holman, 2006. Assessing the impact of visual acuity on quality of life in individuals with type 2 diabetes using the short form-36. Diabetes Care., 29 (7): 1506-1511.

19. Di Iiorio A,Longo A.L., A. Mitidieri Costanza, S. Bandinelli, S. Capasso, M. Giante, *et al*. 1998. Characteristics of geriatric patients related to early and late readmission to hospital. Aging (milano), 10 (4): 339-346.

20. Stewart, A.L., R.D. Hays and J.E. ware Jr. 1988. The MOS short-form general health survey. Med. Care., 26 (7): 724-735.

21. Aalto, A.M., S. Aro, A. Ohinmaa, A.R. Aro and M. Mahonen, 1997. The validation of the SF-20 inert for health quality of life in the finish general populatin. STAKES, National Research and development center for Welfare & Health, 37 Helsinki, Finland.

22. Kotsanos, J.C., D. Marrfero, J.G. Vignati, A.D. Mathias and W. Huster, 1997. Health-related quality of life and associated characteristics in a large national sample of adults with diabetes. Diabetes Care, 20 (4): 562-567.

23. Bockting, W.O., B.R. Rosser and K. Scheltema, 1999. Transgender HIV prevention: implementation and evaluation of a workshop. Health Educ. Res., Apr; 14 (2): 177-183.

24. Tan, A.S., L.S. Yong, S. Wan and M.L. Wong, 1997. Patient education in the management of diabetes mellitus. Singapore Med. J., 38 (4): 156-160.

25. Lin, W.C. and C. Ball, 1997. Factors affecting the decision of nursing students in Taiwan to be vaccinated against hepatitis B infection. J. Adv. Nurs., 25(4): 709-718.

26. Baghianimoghadam, M.H., S.S. Mazloomy and M.H. Ehrampoush, 2005. The effect of health education in promoting health of hairdressers about hepatitis B based on Health Belief Model. J. Acta. Medica Iranica, 43 (5): 342-346.

27. Hawthrone, K. and S. Tomlin son, 1997. one to one teaching with picture-flash card health education for British Asians with diabetes. England. Br. J. Gent. Pvact., 47 (418): 301-304.

28. Baghianimoghadam, M.H.,F. Shafiei, A.R. Haydarneia and M. Afkhami, 2005. Efficay of BASNEF Model in controlling of Diabetic Patients in city of Yazd. Iran. Indian Journal of Community Medicine, 30 (4): 144-145.

29. Jouko Hanninen, Jorma Takala, Sirkka Keinanen-kiukaanniemi. 1998. Quality of life in NIDDM patients assessed with SF-20 questionnaire. Diabetes Research and Clinical Practice., 42: 17-27.

30. Ensaf Saied Abdel-Gawad. Quality of life in Saudis with diabetes. Saudi Journal Disability and Rehablitation, 8 (3): 163-168.