Impact of Quality of Life Education on Self-Concept among Type 2 Diabetes Patients

Nasrin Samadi[1]*, Mahboubeh Safavi[2] and Mahmood Mahmoodi[3]

[1]MSC of Nursing, Faculty of Nursing and Midwifery, Ardabil University of Medical Sciences, Ardabil, Iran
[2]Assistant Professor, PhD of Management of Education, Islamic Azad University, Tehran Medical Branch, Tehran, Iran
[3]Professor, PhD of Biostatistics, Department of Biostatistics, Faculty of Health, Tehran Medical University, Tehran, Iran

Abstract

Background: Type 2 diabetes mellitus is a chronic disease with severe late complications and a chronic illness such as diabetes has effect on self concept. The aim of this study was to determine the effect of quality of life education on self concept of patients with type 2 diabetes.

Methods: This investigation was a random controlled clinical trial study on 123 type 2 diabetes patients admitted to clinic of diabetes in Imam Khomeini Hospital at Ardebil. They diagnosed that 30 up to 70 years old participants are afflicted with type 2 diabetes; randomly divided them in 61 people of case group and 62 people of control group. The questionnaires were composed of socio-demographic status, Beck's self concept test, Rosenberg's Self-esteem and Body image questionnaires and quality of life education plan was codified to educate and evaluate them. P<0.05 is acceptable for all of these tests.

Results: The study showed that participants in case group had low self concept (%29.6), low self esteem(13%) and moderate body image (34.8%) before QOL education and after the intervention increased their self concept (%49.2), self esteem(39%) and decreased their body image (28.6%) , but control group had moderate self concept (43.6%), moderate self esteem (62.5%) and low body image (14.9%) in pre-test and changed to low self concept (20.9%), low self esteem (12.9%) and low body image (29%) in post-test, and there was significant difference in before and after the intervention(P<0.05).

Conclusion: Patients with type 2diabetes often have negative self-concepts, feel hopeless and, therefore, become lax about following their regimen. This study shows that quality of life education can have positive effect on diabetes self concept, and prevent physical and side effects of type 2 diabetes.

Keywords: Education; Quality of life; Self-concept; Type 2 diabetes

Background

Type 2 diabetes mellitus is a chronic disease with severe late complications and high mortality. The increasing prevalence of Type 2 diabetes is mainly due to reduced physical activity and consumption of unhealthy food and larger portion sizes in genetic susceptible individuals [1], and present in every country regardless of their stage of development, and afflicts people in all socio-economic classes [2]. Long-term complications of diabetes include effects on the eyes, kidneys, nerves, and blood vessels that can lead to blindness, neuropathy, and kidney failure [3]. The prevalence of type 2 diabetes in Iran is 4-4.5% and in population aged above 30 years is greater than 14% [4].

Further, although glycemic control, the development of complications and mortality represent critical outcomes in people with type 2 diabetes, quality of life (QOL) outcomes are also important. The value of optimizing QOL has increasingly been recognized not only because it represents an important goal for health care in its own right but also because of the associations between poor QOL and adverse outcomes in people with type2 diabetes, including poor response to therapy, disease progression and even mortality [5]. Quality of life represents a broad, multi-dimensional concept that reflects an individual's sense of well-being or satisfaction with life circumstances [5].

Furthermore, self concept is one's image of oneself, and involves all of the self-perceptions appearance, value, and beliefs that influence behavior and are referred to when using the words *I* or *me*. There are four components of self concept: personal identity, body image, role performance, and self esteem [6]. A positive self concept is essential to a person's mental and physical health. Individuals with a positive self concept are better able to develop and maintain inter personal relationship and resist psychological and physical illness.

Research has shown an association between self concept and health practice across the life span, Also some studies show that education program alone improve glycemic control [7], and promote Quality of life in patients with type 2 diabetes. Also research has shown that quality of life and self esteem decreased in clients with chronic obstructive pulmonary disease and arthritis [8].

The aim o f this study was to determine the effect of quality of life education on self concept of patients with type 2 diabetes. We hypothesize that patients participating in the case group who receive Quality of life education program will improve their quality of life and will promote their level of self concept.

Methods

This was a random controlled clinical trial study and the subjects were 30 up to 70 years old known type 2 diabetes. 180 individuals were

selected randomly among admitted patients to clinic of diabetes in Imam Khomeini hospital at Ardebil. The participants became aware on aim of study and then filled a written consent form. Subjects were neglected for dissatisfaction and uncompleted study form. Then, the subjects were randomly classified in two case and control groups. 14 sick subjects and 22 unattended subjects in training sessions were neglected. Totally there were 123 subjects, 61 subjects of control group and 62 subjects of case one.

The Beck self concept test, Rosenberg's self esteem questionnaire and Body image questionnaire were used to measure participant's current self concept, self esteem and body image as a baseline. The quality of life education as an intervention factor was performed by face-to-face, group teaching methods, and handout to case group. The quality of life education (QOLE) program included a weekly group session of 90 minutes for 8 incessant weeks, limited to 8 patients per group. A nurse, a physiotherapist, a nutritionist, an orthopedist, and a psychologist ran the sessions. The education program was originally developed at the diabetes outpatient that referred to clinic of diabetes in Emam Khomeini Hospital of Ardebil University of medical science. The quality of life education program contents of the sessions included information on the path physiology of diabetes, education in self blood glucose monitoring, the importance of physical activity, healthy diet, weight loss, medication, and smoking cessation if required, the late complications of type 2 diabetes, hypertension and cardiovascular disease, and foot care (as a physical dimension of QOL), and Social support included the resources provided by others that enable the person to feel valued and part of a reliable network of support; this could be family, friends, neighbors, government agencies, and organizations that are available to provide support if needed (as a Social dimension of QOL) , and the importance of control of stress and anxiety (as a Emotional/Spiritual dimension of QOL).

Then, the patients were evaluated 1 month after the final intervention program by follow-up telephone contacts, and again participants filled the same questionnaires (Beck self concept test, Rosenberg's self esteem questionnaire and Body image questionnaire) as a follow up. After the follow up, control group received handout, and the same quality of life (QOL) education program (see Figure 1).

In this study, the inclusion criteria were composed of: to be 30 years of age or older, to have cognitive ability to answer the questions with the research instruments and agreement to take part in the study, Known type 2 diabetes, Both genders. However the exclusion criteria were included of: prior quality of life intervention during the last year, Severe heart, liver, or kidney disease or any incurable cancer, Chronic mental disorder background [17].

I need to mention that study was conducted according to the principles of the Helsinki declaration, Azad-University of Medical science-Tehran branch Committee of Biomedical Research Ethics and the Iranian registry of clinical trials approved the study protocol.
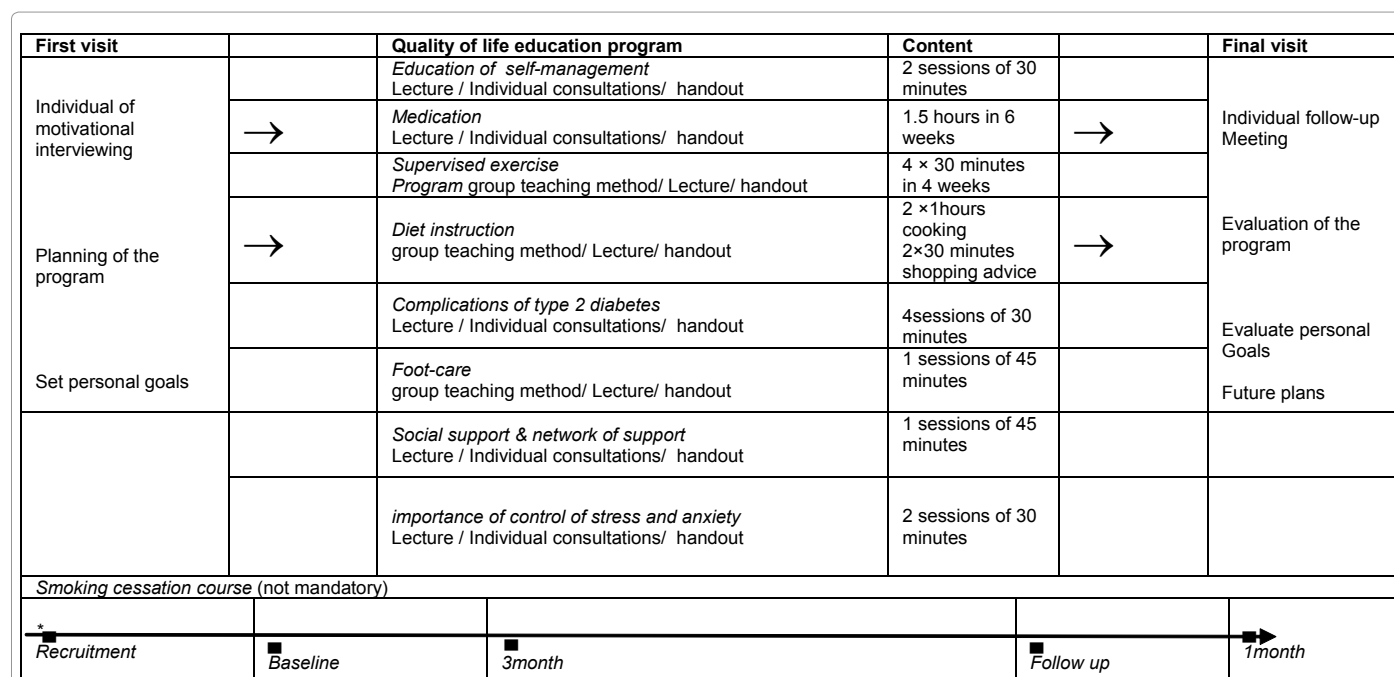
Instruments

The questionnaire composed of four parts

Sociodemographic questionnaire: This questionnaire was prepared to elicit information on demographic and clinical variables such as age, sex, marital status, level of education, family history of diabetes, and drugs [18].

Beck's self concept test (BSCT): 25 questions self concept test is a tool for measuring the negative attitudes towards self. Beck's self concept test differs from other self concept and self-esteem tests in this respect that it asks the subject (responder) to compare her/himself with others rather than using unspecific criteria. Scoring is performed reversely for questions number 2, 3, 6, 8, 13, 21, 23 and directly for other questions [19]. The internal consistency (Cronbach's alpha) of this instrument in previous researches was reported (r=0.80) [20], and in the present study was calculated (r=0.74).

A test-retest method was used for reliability as well, and Pearson's correlation coefficient of this instrument was calculated 0.80.

First visit		Quality of life education program	Content		Final visit
Individual of motivational interviewing	→	*Education of self-management* Lecture / Individual consultations/ handout	2 sessions of 30 minutes	→	Individual follow-up Meeting
		Medication Lecture / Individual consultations/ handout	1.5 hours in 6 weeks		
		Supervised exercise *Program* group teaching method/ Lecture/ handout	4 × 30 minutes in 4 weeks		Evaluation of the program
Planning of the program	→	*Diet instruction* group teaching method/ Lecture/ handout	2 ×1hours cooking 2×30 minutes shopping advice	→	
		Complications of type 2 diabetes Lecture / Individual consultations/ handout	4sessions of 30 minutes		Evaluate personal Goals
Set personal goals		*Foot-care* group teaching method/ Lecture/ handout	1 sessions of 45 minutes		Future plans
		Social support & network of support Lecture / Individual consultations/ handout	1 sessions of 45 minutes		
		importance of control of stress and anxiety Lecture / Individual consultations/ handout	2 sessions of 30 minutes		
Smoking cessation course (not mandatory)					
* *Recruitment*	*Baseline*	*3month*		*Follow up*	1month

*Flow-chart of events in the study [1,9-16]

Figure1: The Quality Of Life Education program outline.

		case		control		P value
Characteristics		N	%	N	%	
Age						P=0.06
30-40		13	21.3	20	32.3	
41-50		15	24.6	26	41.9	
51-60		17	27.9	8	12.9	
61-70		16	26.2	8	12.9	
Sex						P=0.85
Male		31	49.2	30	48.4	
Female		30	50.8	32	51.6	
Marital status						P=0.08
Single, divorced…		4	6.6	12	19.4	
Married		56	91.8	48	77.4	
Habitat						P=0.66
Urban		51	83.6	50	80.6	
Rural		10	16.4	12	19.4	
Employment status						P=0.08
None		33	54.1	29	46.8	
Have job		28	45.9	33	53.2	
Drugs						P=0.93
Tablet		43	70.5	42	67.7	
Insulin		13	21.3	14	22.6	
Tablet & insulin		5	8.2	6	9.7	
Family diabetes history						P=0.08
Yes		34	55.7	44	71.0	
No		27	44.3	18	29.0	
Hospitalize history						P=0.66
None		30	49.2	33	53.2	
1time		16	26.2	12	19.4	
Over 1times		15	24.6	17	27.4	
BMI						P=0.08
Normal		2	1.6	1	0.8	
Overweight		48	39	56	45.5	
Obesity		12	9.8	4	3.3	
Total		61	100	62	100	P>0.05

Table 1: Characteristics of respondents (n=123).

Self concept		Case				Control			
		Low	Moderate	High	Total	Low	Moderate	High	Total
Low	N	4	9	10	23	10	9	1	20
	%	6.6	14.8	16.4	37.7	16.1	14.5	1.6	32.3
Moderate	N	3	6	11	20	16	5	3	24
	%	4.9	9.8	18.0	32.8	25.8	8.1	4.8	38.7
High	N	1	8	9	18	6	9	3	18
	%	1.6	13.1	14.8	29.5	9.7	14.5	4.8	29
Total	N	8	23	30	61	32	23	7	62
	%	13.1	37.7	49.2	100.0	51.6	37.1	11.3	100

Table 2: Level of self-concept in case and control group.

Rosenberg's Self-Esteem questionnaire: To evaluate self-esteem, Rosenberg's Self-Esteem Instrument was used, adapted and validated for the Brazilian culture [21-23]. This instrument consists of ten statements, which can either be agreed or disagreed with. The individual has four answer choices varying from" totally agree to totally disagree". In items 1, 3, 4, 7 and 10, the answer choice "totally agree" refers to the highest self -esteem, while this option points to the lowest self -esteem in items 2, 5, 6, 8 and 9. The internal consistency (Cronbach's alpha) of this instrument was reported (r=0.88) (2) for previous researches but it was (r=0.73) for current study. We used test-retest for reliability too.

Body image questionnaire: To evaluate body image, this Instrument was used. Body image questionnaire is the result of assessing several articles, and consists of thirty statements. The individual has four answer choices varying from" totally positive to totally negative". Scoring is performed reversely for questions number 4, 5, 6,7,9,12,17,18,19,20 and directly for other questions. The internal consistency (Cronbach's alpha) of this instrument in present study was calculated (r=0.88). We used test-re test for reliability too, and Pearson's correlation coefficient of this instrument was calculated 0.93.

Statistical analysis

The data were analyzed using SPSS/PC software (version 11). Descriptive analysis, Chi-square, and Fisher's tests were used to determine the relationship among demographics in case and control group. As already was said that participants were divided to groups randomly, Group I was the case, and group II was the control group. Wilcox and pair t test were used for comparing before and after intervention in case and control group. Furthermore, Independent t test was used to compare two groups (case and control) after intervention. The results of statistical tests were considered significant when p<0.05.

Results

The characteristics of 123 subjects (61 cases and 62 controls) are described in Table 1. The socio-demographic characteristics were similar between 2 groups and showed no significant difference (P>0.05). Also according to scoring BMI (<25 kg/m² normal, 25-29.9 kg/m² Overweight, and over 30kg/m² Obesity) show that most of case (39%) and control (45.5%) group subjects had Overweight before the quality of life (QOL) education (see Table 1), but after the intervention, the most of case group subject's BMI changed to normal (47.5%) and participants in control group had not any change to BMI. Finally, according to the result of Wilcox test, there was significant difference in before and after the intervention (P =0.004).

Data in Table 2 according to scoring self concept (0-33.3% low,

Self esteem		Case				Control			
		Low	Moderate	High	Total	Low	Moderate	High	Total
Low	N	2	4	9	15	8	4	1	13
	%	3.3	6.6	14.8	24.6	12.9	6.5	1.6	21.0
Moderate	N	1	15	11	27	17	4	3	24
	%	1.6	24.6	18.0	44.3	27.4	6.5	4.8	38.7
High	N	1	6	12	19	8	14	3	25
	%	1.6	9.8	19.7	31.1	12.9	22.6	4.8	40.3
Total	N	4	25	32	61	33	22	7	62
	%	6.6	41.0	52.5	100.0	53.2	35.5	11.3	100

Table 3: Level of self-esteem in case and control group.

Body image		Case				Control			
		Low	Moderate	High	Total	Low	Moderate	High	Total
Low	N	7	2	7	16	9	12	3	24
	%	11.5%	3.3	11.5	26.2	14.5	19.4	4.8	38.7
Moderate	N	4	4	9	17	5	11	3	19
	%	6.6%	6.6	14.8	27.9	8.1	17.7	4.8	30.6
High	N	11	5	12	28	3	13	3	19
	%	18.0	8.2	19.7	45.9	4.8	21.0	4.8	30.6
Total	N	22	11	28	61	17	36	9	62
	%	36.1	18.0	45.9	100	27.4	58.1	14.5	100

Table 4: Level of Body-image in case and control group.

	Case				Control				Independent t test
	Before	After	Effect	Pair t test	Before	After	Effect	Pair t test	
	Mean±SD	Mean±SD	Mean±SD		Mean±SD	Mean±SD	Mean±SD		
Self concept	51.16±7.2	60.68±6.7	-9.52±10.80	60=df Pv=0.000	51.41±7.39	53.35±7.69	-1.93±9.94	61=df 0.130=Pv	121=df 0.000=Pv
Self esteem	15.52±1.7	20.52±3.04	-5±3.53	df=60 Pv=0.000	15.75±2.60	16.96±3.11	-1.20±3.87	61=df 0.017=Pv	121=df Pv=0.000
Body image	48.34±6.55	55.86±10.96	-7.52+12.41	df=60 Pv=0.000	47.3±9.1	49.59±8.81	-2.29±11.54	61=df 0.124=Pv	121=df 0.000=Pv
BMI	38.8±4.39	34.9±3.92	4.2±2.96	df=60 Pv=0.000	37.9±7.29	38.1±7.33	0.2±1.64	61=df 0.086=Pv	121=df 0.000=Pv
Total	115.03±13.02	137.08±18.03	22.37+2.20	df=60 Pv=0.000	114.48±14.97	119.91±16.98	-5.43±20.51	61=df 0.041=Pv	121=df 0.000=Pv

Table 5: Compare of case and control group.

33.3%-66.6% moderate, and over 66.6% high self concept) show that case group subjects had low self concept (%29.6) before the quality of life (QOL) education, and after the intervention increased their self concept (%49.2). But participants in the control group had moderate self concept (43.6%) before QOL education and after time of intervention changed to low self concept (20.9%), and according to the result of Wilcox test, there was significant difference in before and after the intervention (P=0.002).

Subjects in case group according to scoring self esteem (0-33.3% low, 33.3%-66.6% moderate, and over 66.6% high self esteem) had low self esteem(13%) before QOL education and after the intervention they had moderate self esteem(39%), but control group had moderate self esteem (62.5%) in baseline and changed to low self esteem (12.9%) in follow up, and according to the result of Wilcox test, there was a significant difference in before and after the intervention (P<0.05) (see Table 3).

Finally Table 4 according to scoring body image (0-33.3% low, 33.3%-66.6% moderate, and over 66.6% high body image) shows that participants before QOL education had moderate body image (34.8%) and changed to low body image (28.6%) after the intervention, in case group. In control group, before QOL education, participants had low body image (14.9%) and after time of QOL education had low body image (29%), too. But to compare before and after the intervention, in both groups (case and control) with Independent t test, there was a statistically significant difference between case and control group (P=0.000).

Pair t test was calculated to assess the effect of QOL education on self concept and its dimensions (self esteem and body image) in each group (see table 5). Subjects' self concept, self esteem, body image and BMI in study group were higher and better than those in the control group, and there was a statically significant difference (P=0.000) between previous and next intervention.

Also, Table 5 shows the result of Independent t test to compare two groups (case and control), and a statically significant difference was indicated (P=0.000) between case and control group, after the intervention.

Discussion

Diabetes mellitus (DM) is a chronic disease (2), health and illness affect self concept. Adaptation with burden of chronic disease affects the self concept. Also, due to the duration and severity of chronic diseases such as diabetes, physical function, psychological, social and economic quality of life is undergoing enormous changes. In addition, health problems, negative effects on their self concept, and the patient may need help to accept the changes in the status and quality of life [8].

In this study, Beck's self concept test shows that participants in case group, before intervention had low self concept that according to above studies, and it increased their self concept after intervention that was due to the positive effects of quality of life education on participants' level of self concept. But control group's participants had moderate self concept before intervention and changed to low self concept after time of intervention. Diabetic patients are at high risk of psychiatric symptoms and psychological symptoms have negative effects on quality of life of patients with diabetes [9]. Furthermore metabolic control is related to level of self-concept [24]. Increased plasma glucose in men and central obesity in women is associated with low self concept [25]. Therefore factors such as hypoglycemia, diabetic foot ulcer, hospitalization for control blood sugar in period of before and after time of intervention was due to descent of self concept in control group, while participates in case group hadn't any diabetic foot ulcer and hospitalization in period of before and after intervention.

The self-esteem and quality of life concepts were related, i.e. , the higher the self-esteem, the better the quality of life in patient with diabetes [2]. The subjects in case group before intervention had low self esteem and after the intervention increased their self esteem that is matched to Swann WB Jr et al. [26] & Taylor TL [27] and Tatiana de Sá Novato et al. [2] studies. But control group, before time of intervention had moderate self esteem and after time of intervention change to low self esteem. Audrey barman et al. [6] showed that full stress related to chronic disease can significantly decrease person's self esteem. Therefore we attached this decrease in self esteem to inability in control of blood sugar, and creation diabetic foot ulcer, stress and anxiety in some of control group's subjects. The presence of depression in diabetic patients has been associated with a high rate of complications [3], and persons with diabetes are at higher risk for depression than the general population [28].

In addition, type II diabetes is extremely common among obese and over 30 years age [29], and showed that obese people are unhappy with their body and obesity is the source of stress related to negative body image [30].

In this study, most of the subjects in case group had BMI = 25-29.9 and BMI = 30 or over, it means were overweight or obese. What is more, obesity is a chronic disorder that cannot obviate it speedily and it should be treated with correct planning for weight loss over time. But comparing case and control, before and after intervention showed little decrease in body image in case group that is due to positive effects of quality of life education on participants' level of body image.

Gardner et al. [31] has done first research entitled "Quality of Life Program". Also researches stated that concepts of quality of life and self concept are interrelated [2]. Indeed self concept is root of all

behavior is shown in persons [10]. People with positive self concept, can be better developed, interpersonal relationships protect against disease and resistance to physical and mental. Someone who has a positive self concept is quite strong and can accept the changes that occur throughout life better [6]. Diabetic patients are subject to various stresses that can lead to potential losses and changes in lifestyle. Subjective symptoms and medical complications can lead to functional limitations and changes in quality of life [3]. Furthermore training of health care has a very profound influence on factors affecting quality of life and satisfaction of treatment in diabetic patients [32].

In the present study, quality of life education can improve diabetes' self concept, self esteem and body image. The intervention also improved their knowledge of diabetes and their emotional status.

Conclusion

Patients with type 2diabetes often have negative self-concepts, feel hopeless and, therefore, become lax about following their regimen. This study shows that quality of life education can have positive effect on diabetes self concept, and prevent physical and side effects of type 2 diabetes.

Acknowledgements

References

1. Vadstrup E, Frolich A, Perrild H, Borg E, Roder M (2009) Lifestyle intervention for type 2 diabetes patients – trial protocol of The Copenhagen Type 2 Diabetes Rehabilitation Project. BMC Public Health 9: 166.

2. De Sá Novato T, Aurora S, Grossi A, Kimura M (2007) Quality of life and self-esteem of adolescents with diabetes mellitus. Acta paul Enferm 21: 562-567.

3. Coelho R, Amorim I, Prata J (2003) Coping Styles and Quality of Life in Patients With Non-Insulin-Dependent Diabetes Mellitus. Psychosomatics 44: 312–318.

4. Baghianimoghadam MH, Afkhami Ardekani M (2007) The effect of education intervention on quality of life of diabetic patients type 2 referee to diabetic research center of Yazd. Journal of Gonabad Faculty of Health and Medicine. 13: 21-29.

5. Ali S, Stone M, Chas-Skinner T, Robertson N, Davies M, et al. (2010) The association between depression and health-related quality of life in people with type 2 diabetes: A systematic literature review. Diabetes Metab Res Rev 26: 75-89.

6. Berman Audrey (2008) Fundamentals of Nursing: Concepts, Process and Practice. 8th edition, "Pearson Education International".

7. Trento M, Passera P, Bajardi M, Tomalino M, Grassi G, et al. (2002) Lifestyle intervention by group care prevents deterioration of Type II diabetes: a 4-year randomized controlled clinical trial. Diabetologia 45: 1231-1239.

8. Harkreader H (2007) "Fundamentals of nursing: caring and clinical judgment". 3rd edition, Philadelphia, Lippincott.

9. Centers for Disease Control and Prevention (2005) Social support and health-related quality of life among older adults – Missouri, 2000. Morbidity and Mortality Weekly Report 54: 433-437.

10. Kurtus, Eleanor M (2002) Lifestyle Factors Affecting Quality of Life in Late Adulthood. http://www.schoolfor-champions.com/health/lifestyle_elderly.htm (accessed June 2, 2008).

11. Legacy Caregiver Services (2006) The caregiver helpbook: powerful tools for caregivers. Legacy Health System: Portland, Oregon.

12. National Family Caregivers Association. Accessing Resources: Telephone Tips and Techniques That Can Help.

13. National Senior Corps Association.

14. Samaritan Health Services (2004) Ten Reasons to Keep Fit as you Age.

15. U.S. National Institutes of Health, National Institute on Aging. 2001. Dramatic decline in disability continues for older Americans.

16. Volz, Joe (2000) Successful aging: the second 50. Monitor on Psychology, Vol. 31: No. 1.

17. Vadstrup ES, Frølich A, Perrild H, Borq E, Røder M (2009) Lifestyle intervention for type 2 diabetes patients – trial protocol of The Copenhagen Type 2 Diabetes Rehabilitation Project. BMC Public Health 9:166.

18. Mosaku K, Kolawole B, Mume C, Ikem R (2008) Depression, Anxiety and Quality of life among Diabetic Patients: A comparative study. J Natl Med Assoc 100: 73-78.

19. Narimani M, Mousazadeh T (2010) Comparing self-esteem and self-concept of handicapped and normal students. Procedia Social and Behavioral Sciences 2: 1554–1557.

20. Beck AT, Steer Robert, Epstein Norman, Browngary (1990) Beck self-concept test; psychological assessment. Journal of conculting and clinical psychology 2: 191-197.

21. Rosenberg M (1965) Society and the adolescent self-image. Princeton, NJ: Princeton University Press.Satorra, A., & Bentler, P. (1994). Corrections to test statistics and standard errors in covariance structure analysis. In A. von Eye, & C. Clogg (Eds.), Latent variables analysis (pp. 399–441). Thousand Oaks, CA: Sage.

22. Greenberger E, Chen CH, Dmitrieva J, Farruggia SP (2003) Item-wording and the dimensionality of the Rosenberg Self-Esteem Scale: do they matter?. Personality and Individual Differences 35: 1241–1254.

23. Dini GM. Adaptação cultural, validade e reprodutibilidade da versão brasileira da escala de auto-estima de Rosenberg [tese]. São Paulo: Universidade Federal de São Paulo; 2001.

24. Maharaj SH, Daneman D, Olmsted M, Rodin G (2004) Metabollic Control in Adolescent girls. Diabetes Care 27: P709-715.

25. Miettola J, Leo K, Niskanen H, Viinamak , Sintonen H, et al. (2008) Metabolic syndrome is associated with self-perceived depression. Scand J Prim Health Care 26: 203-210.

26. Swann WB Jr, Chang-Schneider C, Larsen MKClarty K (2007) Do people's self-views matter? Self-concept and self-esteem in everyday life. Am Psychol 62: 84-94.

27. Taylor TL, Montgomery P (2007) Can cognitive – behavioral therapy increase self – esteem among depressed adolescents? A systematic review. Children and Youth Services Review 29: 823-839.

28. Osborn CY, Trott HW, Buchowski MS, Patel KA, Kirby LD, et al. (2010) Racial Disparities in the treatment of Depression in low, Incame Patients with diabetes. Diabetes Care 33: 1050-1054.

29. Eugene B (2008) Harrison's Principle of Internal Medicine.17th edition.

30. Makara-Stuxzinsk M, Zaborska A (2009) Obesity and body Image. Psychiatri pol. 43: 109-114.

31. Gardner R (1977) Quality of life education program. Journal of visual impairment and blindness. 71: 435-437.

32. Gurkova E, Cáp J, Žiaková K (2009) Quality of life and treatment satisfaction in the context of diabetes self-management education. International journal of nursing practice 15: 91-98.