

QUALITY OF LIFE AND PSYCHOLOGICAL HEALTH OF PEOPLE LIVING WITH HIV/AIDS (PLWHA) SEEN IN BENIN CITY, NIGERIA

CE OFOVWE^{1*}, AN OFILI^{2*}, GE OFOVWE^{3*}
_{1,2,3}

ABSTRACT

Background: Living with HIV/AIDS affects a wide spectrum of an individual's life ranging from the physical, social, economic to the psychological. The demands and implications of the disease impact on the Quality of life and psychological health of sufferers. The objective of this study is thus to assess the quality of life and psychological health of PLWHA seen in Benin City, Nigeria.

Material & Methods: The study was conducted in Benin City, Nigeria. The study population involved eight hundred and forty one (M=216, F=625) people living with HIV/AIDS of varying socio-demographic background. Data was collected using the World Health Organization Quality of Life (WHOQOL)-BREF and General Health Questionnaire (GHQ 28). Data was analysed descriptively and analytically using Statistical Package for Social Sciences version 21. Patients were consecutively recruited from the consultant outpatient clinics of the University of Benin Teaching Hospital and Central Hospital, Benin City.

Results: Our results show that more females were represented in this study than males (M=216; 25.7%; F=625; 74.3%). The gender of PLWHA did not affect their quality of life on all the domains of WHOQOL nor the likelihood of the presence of psychological disorder as measured by GHQ 28. Patients aged above seventy years had a significantly higher likelihood of vulnerability to psychological disorder. Employed PLWHA had a significantly higher quality of life on the physical health domain (P=0.001) of WHOQOL and fared better than the unemployed on all other domains of WHOQOL.

Conclusion: The generality of the study population assessed their quality of life as very good as well as their health. The absence of psychological disorder in a majority of the PLWHA corroborates their evaluation and further underscores the relationship between quality of life and mental health. Our result stresses the need to pay attention to aged PLWHA.

Keywords: HIV/AIDS, Quality of life, Psychological health, Nigeria.

INTRODUCTION

Human immune deficiency virus infection (HIV) and acquired immune deficiency syndrome (AIDS) refer to a spectrum of disease condition. As at 2012 AIDS had claimed an estimated 36 million lives worldwide. In 2014 the HIV/AIDS pandemic resulted in about 1.2 million deaths and 36.9 million people were living with HIV.^[1] Sub-Saharan Africa is the region most affected by HIV/AIDS. In 2010, an estimated 68% (22.9)

million of all HIV cases and 66% of all deaths (1.2million) occurred in this region with women composing about 60% of cases^[2].

Nigeria has the largest proportion of people living with HIV, as at 2014, the prevalence rate among persons aged between 15 and 45 was estimated at 3.17%.^[1, 2] The HIV epidemic varies in intensity from region to region in Nigeria.^[3, 4] Generally, youths and young people are particularly vulnerable with young women most susceptible. The risk factors implicated in HIV epidemic include multiple sexual partners, international trafficking of women, high prevalence of sexually transmitted diseases,

CE OFOVWE^{1*}, AN OFILI^{2*}, GE OFOVWE^{3*}
_{1,2,3}

School of Medicine, College of Medical Sciences, University of Benin, Benin City, Nigeria
*Correspondence to: Prof. C.E. Ofovwe, School of Medicine, College of Medical Sciences, University of Benin, Benin City, Nigeria.
E-mail : cofovwe@yahoo.com, caroline.ofovwe@uniben.edu

high risk heterosexual and homosexual practises, irregular blood screening and unsafe blood transmission.^[5]

HIV is a highly stigmatised chronic disease with a substantial co-occurrence of mental health problems^[6] This is barely surprising because HIV infection can predispose a patient to mental health problems due to the associated shame, stigma and discrimination^[7-9]. As a chronic disease HIV has the potential of impacting the patients quality of life, World Health Organization (WHO) defines quality of life (QoL) as “individuals' perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns”^[10].

An assessment of QoL can provide necessary information in areas where PLWHA are impacted with a view of proffering solutions to reduce identified areas of challenge. It has also been proposed that QoL assessment introduces empathy into a system of health care delivery which tends to focus on symptomatic improvement which is rather mechanistic^[11, 12]. This paper therefore attempts to assess the quality of life and psychological health of PLWHA seen in Benin City, Nigeria.

MATERIALS AND METHODS

The study was conducted between November 2014 and August 2015 in the University of Benin Teaching Hospital, (UBTH) and Central Hospital, both in Benin City, the capital of Edo State, Nigeria. UBTH is a federal tertiary health facility while Central Hospital is a state government owned secondary health care institution. The sample size was calculated using the Cochran's formula^[13] for studying proportions in cross sectional studies. The study population involved 841 PLWHA drawn from the consultants' clinics of both health institutions. Only above 18 years PLWHA were included in the study, they were consecutively recruited at the consultant outpatient clinics of the respective hospitals after due informed verbal consent was obtained. Data was collected with the aid of trained research assistants. The research assistants were university graduates trained by members of the research team prior to data

collection.

The study was a descriptive cross-sectional study, it was questionnaire based and no invasive procedure was involved. Ethical clearance was obtained from both University of Benin Teaching Hospital and Central Hospital Ethics Committee. The World Health Organization Quality of Life (WHO QoL)-BREF (26)^[14] was used to assess quality of life while the General Health Questionnaire (GHQ28)^[15] was used to assess the psychological health of the respondents. The WHO QoL BREF (26) comprise 4 domains with the following facets incorporated: Domain 1 (Physical health) evaluated activities of daily living, dependence on medicinal substances and medical aids, energy and fatigue, mobility, pain and discomfort, sleep and rest, work capacity; Domain 2 (Psychological) evaluated bodily image and appearance, negative feelings, positive feelings, self-esteem, spirituality / religion / personal beliefs, thinking, learning, memory and concentration; Domain 3 (Social relationship) evaluated personal relationships, social support and sexual activity; Domain 4

(Environment) evaluated financial resources, freedom, physical safety and security, health and social care accessibility and quality, home environment, opportunities for acquiring new information and skills, participation in and opportunities for recreation / leisure activities, physical environment (pollution / noise / traffic / climate) and transport. The GHQ (28) is divided into four subscales which assess somatic symptoms, anxiety and insomnia, social dysfunction and severe depression. Using the binary method of scoring, (0-0-1-1) a score of 4 and above indicates the presence of psychological distress. Data was treated both descriptively and analytically. Analysis was done using SPSS version 21.

The limitation of the study lies on its being a hospital based study with its inherent weakness of low generalization of research findings. It is suggested that future studies should be community based.

RESULTS:

Table 1: Socio demographic characteristic of people living with HIV/AIDS

Variables	Frequency (n=841)	(%)
Age in Years		
<20	17	(2.0)
20 – 29	86	(10.2)
30 – 39	259	(30.8)
40 – 49	269	(32.0)
50 – 59	138	(16.4)
60 – 69	62	(7.4)
=70	10	(1.2)
Gender		
Male	216	(25.7)
Female	625	(74.3)
Level of Education		
None	34	(4.0)
Primary	292	(34.7)
Secondary	392	(46.6)
Tertiary	123	(14.6)
Marital Status		
Single	132	(15.7)
Married	468	(55.6)
Co-habiting	7	(.8)
Separated	25	(3.0)
Divorced	50	(5.9)
Widowed	159	(18.9)
Religion		
Christian	821	(97.6)
Moslem	16	(1.9)
Traditionalist	4	(.5)

As shown in Table 1, a total of 841 PLWHA were involved in the study, with a majority between 30 to 49 years (n=528; 62.8%). The least represented age group were those less than twenty years (n=17; 2.0%) and those above seventy years (n=10; 1.2%). There were more females living with HIV/AIDS than males (M=216; 25.7%; F=625; 74.3%). A majority of the respondents had secondary school education (n=392; 46.6%), those with no form of formal education were the least represented (n=34; 4.0%). The majority of the respondents were married (n=468; 55.6%). The study population was predominately Christian (n= 821; 97.6%).

Table 2: PLWHA level of satisfaction with their Quality of Life and health

Variable	Frequency (n=841)	(%)
Satisfaction with quality of life		
Very Poor	13	(1.5)
Poor	76	(9.0)
Neither poor nor Good	154	(18.3)
Good	244	(29.0)
Very Good	354	(42.1)
Satisfaction with health		
Very Dissatisfied	18	(2.1)
Dissatisfied	113	(13.4)
Neither dissatisfied nor Satisfied	116	(13.8)
Satisfied	259	(30.8)
Very Satisfied	335	(39.8)

Most of the respondents' level of satisfaction with their quality of life was very good (n=354; 42.1%). On the whole, (n=76; 9.0%) and (n=13; 1.5%) respondents described their level of satisfaction with their quality of life as poor or very poor respectively. Similarly, a majority of them were satisfied (n=259; 30.8%) or very satisfied (n=335; 39.8%) with their health. One hundred and thirty one (15.5%) respondents were dissatisfied or very dissatisfied with their health.

Table 3: Socio-demographic characteristics and WHO BREF domains of PLWHA

Variable	Domain 1	Domain 2	Domain 3	Domain 4
Age in Years				
<20	15.6±1.8	16.0±2.3	13.6±3.2	14.4±1.8
20-29	15.7±2.2	16.9±2.7	13.4±2.7	15.0±2.5
30-39	16.0±2.1	16.8±2.5	13.5±2.8	15.1±2.2
40-49	15.7±2.3	16.8±2.9	13.1±2.9	14.9±2.5
50-59	15.2±2.2	16.4±2.5	12.4±2.5	14.7±2.3
60-69	13.7±2.8	15.8±3.0	11.8±2.8	11.1±2.6
>70	11.3±2.4	15.6±3.8	11.5±3.2	13.9±3.5
F -test	15.350	2.069	5.484	2.063
P value	0.001	0.055	0.001	0.055
Gender				
Male	15.5±2.5	16.6±2.8	13.2±2.8	14.8±2.6
Female	15.2±2.7	16.7±2.7	13.0±2.9	14.9±2.3
t-test	-0.332	-0.469	1.171	-0.249
P-value	0.740	0.639	0.242	0.803
Educational level				
None	14.3±2.7	16.3±2.8	11.7±2.3	14.5±2.3
Primary	15.3±2.3	16.5±2.7	12.7±2.8	14.8±2.1
Secondary	15.8±2.4	16.8±2.7	13.3±2.8	15.0±2.4
Tertiary	15.5±2.4	16.3±2.7	13.4±3.1	14.6±2.8
f-test	5.875	1.697	5.773	0.831
P-value	0.001	0.166	0.001	0.477
Marital Status				
Single	15.7±2.1	16.5±2.7	13.1±3.0	14.7±2.3
Married	15.9±2.3	16.9±2.7	13.6±2.8	15.1±2.5
Co-habiting	15.3±2.9	15.7±2.5	13.0±3.2	15.2±1.5
Separated	14.1±3.3	14.7±3.3	12.0±2.7	13.5±3.0
Divorced	15.8±2.0	16.8±2.7	11.6±1.9	15.1±2.0
Widowed	14.8±2.6	16.4±2.7	11.9±2.6	14.5±2.2
f-test	-0.332	-0.469	1.171	-0.249
P Value	0.740	0.639	0.242	0.803
Religion				
Christian	15.1±2.4	16.6±2.7	13.0±2.9	14.9±2.4
Moslem	14.9±1.7	17.1±2.7	12.9±2.1	15.0±1.7
Traditionalist	15.7±3.0	17.7±2.0	13.0±2.3	14.4±3.4
f-test	0.075	0.519	0.029	0.085
P Value	0.928	0.595	0.972	0.919
Employment Status				
Presently Employed	15.7±2.2	16.7±2.7	13.1±2.8	14.9±2.4
Not Employed	14.7±2.8	16.3± 2.7	12.7±2.9	14.6±2.3
T test	5.103	1.770	1.675	1.756
P Value	0.001	0.077	0.094	0.079

Key:

DOMAIN 1: Physical Health DOMAIN 3: Social Relationship
 DOMAIN 2: Psychological Health DOMAIN 4: Environment

Table 3 shows that there exists a statistically significant association between the different domains of WHOBREF and age. On physical health: Domain (I) of the WHOBREF, PLWHA aged 30-39 years thrived better on physical health than other age groups (F 15.35.; p< 0.001). As expected persons above 70 years were most negatively impacted on the physical health domain whereas on psychological health (Domain 2), PLWHA aged 30-39 had the highest mean scores, indicating a better QoL. The same was also observed of the domain 4 (environment). It was also found that patients aged less than 20 years were significantly better on the social relationship (Domain 3). No significant difference was found between male and female persons living with HIV/AIDS positive patients on the different domains of WHO BREF.

Association between the level of education and the WHO BREF domains was found to be significant as it pertains to physical health and social relationships. Respondents with secondary education had significantly higher mean scores on the physical health domain (15.8 ± 2.4; P < 0.001), while patients with tertiary education scored significantly higher on the social relationships domain (13.4 ± 3.1; P < 0.001). Our results show that marital status as well as religion did not significantly affect any of the domains of quality of life assessed by WHO BREF.

Table 4: Socio-demographics and Psychological disorder in PLWHA

Variable	Psychological Disorder		TOTAL	χ^2	P value
	ABSENT	PRESENT			
Age groups					
<20	9 (52.9)	8 (47.1)	17 (100.0)	41.228	0.001
20 – 29	62 (72.1)	24 (27.9)	86 (100.0)		
30 – 39	203 (78.4)	56 (21.6)	259 (100.0)		
40 – 49	218 (81.0)	51 (19.0)	269 (100.0)		
50 – 59	103 (74.6)	35 (25.4)	138 (100.0)		
60 – 69	34 (54.8)	28 (45.2)	62 (100.0)		
=70	2 (20.0)	8 (80.0)	10 (100.0)		
Gender					
Male	168 (77.8)	48 (22.2)	216 (100.0)	1.100	0.294
Female	463 (74.1)	162 (25.9)	625 (100.0)		
Level of Education					
None	18 (52.9)	16 (47.1)	34 (100.0)	13.676	0.003
Primary	216 (74.0)	76 (26.0)	292 (100.0)		
Secondary	310 (79.1)	82 (20.9)	392 (100.0)		
Tertiary	87 (70.7)	36 (29.3)	123 (100.0)		
Marital Status					
Single	97 (73.5)	35 (26.5)	132 (100.0)	24.317	0.001
Married	378 (80.8)	90 (19.2)	468 (100.0)		
Co-habiting	4 (57.1)	3 (42.9)	7 (100.0)		
Separated	18 (72.0)	7 (28.0)	25 (100.0)		
Divorced	29 (58.0)	21 (42.0)	50 (100.0)		
Widowed	105 (66.0)	54 (34.0)	159 (100.0)		
Religion					
Christian	614 (74.8)	207 (25.2)	821 (100.0)	1.354	0.508
Moslem	14 (87.5)	2 (12.5)	16 (100.0)		
Traditionalist	3 (75.0)	1 (25.0)	4 (100.0)		
Others					

Table 4 shows that prevalence of psychological disorders was found to be significantly associated with age of the respondent ($\chi^2= 41.23$, $p= 0.001$). The age group between 40-49 years had the least proportion of the presence of psychological disorder. The likelihood of psychological disorder was highest in PLWHA aged seventy years and above (8; 80%) than other age groups. It was highest at the extremes of life. Interestingly, there was no regular pattern to the association i.e. it was neither positive nor negative in direction. There was no significant association between gender and psychological disorder among PLWHA. Prevalence of psychological disorder was found to be significantly higher among PLWHA who are co-habiting ($\chi^2= 24.31$; $p= 0.001$).

Table 5: Relationship between WHO BREF and GHQ 28 in PLWHA

	ABSENT (n=631)	PRESENT (n=210)	t value	P value
DOM 1	16.17 ± 1.85	13.53 ± 2.71	15.808	0.001
DOM 2	17.16 ± 2.38	15.04 ± 3.05	10.363	0.001
DOM 3	13.39 ± 2.68	12.00 ± 3.06	6.250	0.001
DOM 4	15.23 ± 2.22	13.72 ± 2.48	8.285	0.001

Psychological disorder as measured by GHQ 28 was absent in 631 (75%). The mean score for all the domains were higher among who did not have psychological disorder. This corroborates the details presented in Table 2 indicating a favourable assessment of QoL and health. It is noteworthy that the subjective evaluation given is objectively supported. Furthermore this indicates that the higher the WHO BREF scores the higher the chance of psychological wellbeing. In order words, WHO BREF in addition to its being a standard of evaluating quality of life also provides a predictive criterion of psychological health.

Psychological health was found to have the highest mean score in this study and social relationship the least mean score. This indicates that social relationship domain which evaluated personal relationships, social support and sexual activity was the most negatively impacted of the domains of QoL.

DISCUSSION

In this study a majority of the perceived their QoL as good or very good as also reported by Samson-Akpan et al [16] from Cross River State in Nigeria. Ordinarily one would have expected a contrary report owing to the nature of HIV/AIDS and its accompanying distresses as often experienced in stigmatization and the characteristic burden of chronic disease. Our result may however be attributed to improved services for PLWHA in addition to the provision of subsidized/free medication presently enjoyed by PLWHA by the President's Emergency Plan for AIDS Relief (PEPFAR)

which is a United States Governmental initiative to address the global HIV/AIDS epidemic in Nigeria. This finding affirms the association of advancement in clinical practices with improved survival index among PLWHA. [17,18].

Characteristically, there were more females in this study than males. However, gender did not significantly affect quality of life on all the domains of WHO BREF contrary to a previous report by Fatiregun et al. [19] In studies where women reported lower HRQoL [20- 22] it is often attributed to the fact that women are more likely to report unfavourable experiences than men who prefer to hold a stoic attitude. The reason for our finding is not apparent but it is however consistent with the general lack of agreement on the role of gender in health related quality of life studies. [23] The place of gender in QoL among PLWHA still remains unclear in view of the inconsistent reports, however, it is not unlikely that the relationship between gender and QoL among PLWHA is a creation of culture and environmental factors, this calls for further research.

With regards to age, PLWHA aged 30-39 had a better index of QoL on physical health and environment domains, this may be attributed to their being in the prime of their lives and naturally put in the best against whatever comes their way, they are also more likely to have settled into a career path and have families of their own, these factors can considerably affect QoL positively in view of providing a sense of accomplishment. This viewpoint supports Basavaraj's [24] assertion that the coping strategy of social

disengagement reported to be responsible for poor social relationship among HIV patients is not common in the younger age group.

Education has been reported to have a linear relationship with quality of life.^[25] Level of education was associated with perception of quality of life in different domains of WHOQOL. While PLWHA with secondary education perceived their physical health domain better than other domains, those with tertiary education were better off in the social relationship domain. Invariably, education provides the wherewithal to handle the components of quality of life. This may not be unrelated to the more informed outlook the educated person is bound to have compared to the uneducated. Research findings suggest that the more educated a patient is, the better the understanding at counselling and the easier it becomes to follow through with accepting and complying with treatment regimens with obvious consequence on quality of life.^[26,27]

The negative impact of the disease on the social relationship domain, calls for more effort at enlightenment, the attitude towards PLWHA has the potential of affecting their personal/social relationship. It is therefore imperative that all stake holders should consciously make effort to lighten the burden of PLWHA by being more supportive on all areas of care involving psychosocial concerns.

CONCLUSION

The study shows that PLWHA have a positive assessment of their quality of life and health, however the domains of QoL evaluated were impacted differently. The most impacted domain was the social relationship domain. The immediate implication of this finding is the need for support to be rendered to PLWHA to ameliorate the general burden of the disease. This calls for the establishment of support groups wherever PLWHA receive services, the benefits of which cannot be over emphasised.

The relationship found between QoL and psychological disorder in this study further underscores the implication of mental wellbeing in the chronically ill. This therefore calls for further appraisal of the predictors of a positive QoL among PLWHA in view of its linear relationship with mental

health.

ACKNOWLEDGEMENT:

We wish to express our sincere gratitude to all PLWHA who participated in this study. We also gratefully acknowledge the sponsorship of the study by (TETFUND) University of Benin, Benin City, Nigeria.

REFERENCES

1. Report on the global AIDS epidemic, Geneva: UNAIDS (2013).
2. Executive summary: How AIDS changed everything- "[MDG 6: 15 YEARS, 15 LESSONS OF HOPE FROM THE AIDS RESPONSE](http://www.unaids.org)" <http://www.unaids.org> (2015)
3. Country Comparison : HIV/AIDS-Adult prevalence rate [CIA World Factbook](#) (2014).
4. Country Profile: Nigeria U.S. Department of State (2018). [HIV/AIDS - People Living with HIV/AIDS CIA World Factbook](#)
5. (2014)
6. Whetten K, Reif S, Whetten R, Murphy-McMillan K. Trauma, Mental Health, Distrust, and Stigma Among HIV Positive Persons: Implications for Effective Care. *Psychosom Med.* 2008; 70:531–538.
7. Alegria M, Vila D, Train S, Williams S, El-Bassel N *Epidemiology.* In *Psychiatric aspects of HIV/AIDS.* Lippincott, Williams & Wilkins. (2006) 3–10.
8. Collins PY, Elkington KS, von Unger H, Sweetland A, Wright ER, Zybert PA Relationship of stigma to HIV risk among women with mental illness. *Am J Orthopsychiatry* 2008; 78:498–506.
9. Wingood GM, Diclemente RJ, Mikhail I, McCree DH, Davies SL, Hardin JW, Harris Peterson S, Hook EW, Saag M HIV discrimination and the health of women living with HIV. *Women Health* 2007; 46:99–112
10. The WHOQOL Group World Health Organization Quality of Life Assessment (WHOQOL): Position Paper From the World Health Organization. *Soc.Sci Med* (1995); 41(10):1403-1409

11. Saxena S, Orley J. Quality of life assessment: The World Health Organization Perspective. *Eur Psychiatr* 1997; 12S3:263s-266s
12. The WHOQOL Group. Development of the WHOQOL: Rationale and current status. *International Journal of Mental Health*, (1994a); 23(3), 24-56.
13. Cochran, W .G. (1963) Sampling Techniques, Wiley, New York.
14. WHOQOL-BREF Introduction, administration, scoring and generic version of the assessment . field Trial Version 1996 programme on mental health, WHO, Geneva.
15. Goldberg D. (1978) Manual of the General Health Questionnaire . Windsor: NFER-Nelson
16. Samson-Akpan PE, Ojong IN, Ella R, Edet OB Quality of life of people living with HIV/AIDS in Cross River State, Nigeria. *Int. J. Med Biomed Res.* 2013 2 (3):207-212.
17. World Health Organization What is quality of life? *World Health Forum* 1996; 1:354-356
18. Basavaraj KJ, Navya MA, Rashmi R. Quality of life in HIV/AIDS. *Indian J Sex Transm Dis.* 2010; 31(2) 75-80. doi 10.4103/0253 7184.74971
19. Fatiregun AA, Mofolorunsho KC, Osagbemi KG Quality of life of people living with HIV/AIDS in Kogi State, Nigeria. *Benin J Postgraduate Med* 2009.; 11:21-27 20. Briongos *Figuero LS, Luque PB, Martin TP, Sagrado MG, Bouza JME* Assessment of factors influencing health related quality of life in HIV-infected patients. *HIV Med.* 2011; 12: 22-30. 10.1111/j.1468-1293.2010.00844. 21. Protopopescu C, Marcellin F, Spire B, Preau M, Verdon R, Peyramond D, Raffi F, Chene G, Leport C, Carrieri MP Health related quality of life in HIV-1-infected patients on HAART: a five years longitudinal analysis accounting for dropout in the APROCO-COPILOTE cohort (ANRS CO-8). *m Qual Life Res.* 2007; 16: 577-591. 10.1007/s11136-006-9151-7.
22. Rao D, Hahn EA, Cella D, Hernandez L *The health related quality of life outcomes of English and Spanish speaking persons living with HIV/AIDS from the Continental United States and Puerto Rico. Aids Patient Care St.* 2007 ; 21 : 339 - 346 . 10.1089/apc.2006.0124. Perez IR, Lima AODL, del Castillo LS, Bano JR, Ruz MAL, Jimenez AD No differences in quality of life between men and women undergoing HIV antiretroviral treatment.
23. Impact of demographic, clinical and psychosocial factors. *Aids Care.* 2009 ; : 21 : 943 - 952 . 10.1080/09540120802612840.
24. Basavaraj KJ, Navya MA, Rashmi R Quality of life in HIV/AIDS. *Indian J Sex Transm Dis.* 2010, :31(2) 75-80. doi 10.4103/0253 7184.74971
25. Hays RD, Cunningham WE, Sherbourne CD, Wilson IB, Wu AW, et al. Health-related quality of life in patients with human immunodeficiency virus infection in the United States: results from the HIV cost and services utilization study. *Am J Med.* 2000; 108: 714-722. 10.1016/S00029343(00)00387-9.
26. Moattari M, Ebrahimi M, Sharifi N, Rouzbeh J The effect of empowerment on the self-efficacy, quality of life and clinical and laboratory indicators of patients treated with hemodialysis: a randomized controlled trial. *Health Qual Life Out.* 2012; 10: [Google Scholar](#)
27. Pibernik-Okanovic M, Prasek M, Poljicanin Filipovic T, Pavlic-Renar L, Metelko Z Effects of an empowerment-based psychosocial intervention on quality of life and metabolic control in type 2 diabetic patients. *Patient Educ Couns.* 2004; 52: 193 -199. 10.1016/S0738 3991(03)00038-7.