**Association Between Socio- Demographic Variables And Quality Of Life Among Liver Transplant Candidates: A Cross Sectional Study In Iran**

**Abstract:**

**Background**: Quality of life (QOL) is the main subject among liver transplant candidates. Because this subject is not well-understood, the aim of this study is to evaluate the effects of socio-demographic variables on QOL.

**Method**: This is a cross sectional study which evaluated the condition of QOL among 210 liver transplant candidates in Shiraz, Iran. We used questionnaire including demographic and socioeconomic conditions of the patient beside CLDQ questionnaire for data gathering. Statistical analysis was conducted using the SPSS version 21. P-value less than 0.05 was considered statistical significance.

**Results**: Results showed that the score of male in emotion was more than female significantly (P=0.05). Patients with age lower than 30 years old and patients with low BMI had more score of QOL (p=0.05). Single patients had lower worries than marrieds (p=0.05). Patients with Governmental Health Insurance had less worries and more emotions than patients with others insurances and these patient had more EM (P<0.01). Patients who live in the region 3 Geographical in Iran had less CLDQ than others patients (P<0.05).

**Conclusion**: This study showed that gender, age, region of living, BMI, and health insurance effect QOL of liver transplant candidates. Policies should consider to this variables with emphasis on decreasing stress and anxiety among these patients. In addition policies should have more consideration on the patients of three regional provinces of Iran (north and northwest provinces) for solve their problems because of their distance of the center of transplantation (p=0.04).

**Key words:** Liver Transplantation, Quality of life, Iran

**Introduction**

Quality of life (QOL) is the territory of novelists and philosophers which is an elusive concept approachable at varying levels of generality from the assessment of societal or community wellbeing to the specific evaluation of the situations of individuals or groups [1]. It can only be described by the individual, and must take into account many aspects of life [2]. A model of quality of life is proposed that integrates objective and subjective indicators, a broad range of life domains, and individual values [3]. It can be related to human being's ability to enjoy normal life activities as well as his/her psychological conditions. Thus subjectivity of QOL is best measured from the patient's perspective which In this context, QQL is best understood as representing the gap between one’s actual functional level and one’s ideal standard [4].

Illness is the main problem which affects the quality of life (QOL) of human beings [5, 6]. Decreasing the life expectation, limitation activity, increasing pains, psychological problems, and increasing costs are the main problem that affect QOL. However, QOL is related with the type of disease and measure of its affects in all dimensions of life. Chronic liver disease (CLD) results from a variety of disorders and is a major cause of morbidity and mortality worldwide [7]. Liver disease is a chronic problem which affects QOL significantly. Due to several problems which are related to this disease, patients face with multiple problems which limit their life. For example [depression](http://www.sciencedirect.com/science/article/pii/S0163834305001076) and anxiety is common among them [8] which effects their QOL [9]. However, the type and severity of chronic liver disease may have different effects on health-related quality of life [10].

Liver transplant is an important strategy for theses patient for solving their problems. Livers transplant candidates face with several problems. These patients face with several psychosocial problems as well as physical. This leads to deficiency in QOL of these patients. Recently a study showed that significantly high levels of burden, stress, and depression among these patients [11]. However, QOL of these patients needs more explanation specifically about their demographic and social characteristics. The main goal of this study is to evaluate the QOL among liver transplant candidates with emphasis on their socio-demographic situations.

**Material and method**

# This is a descriptive-analytical cross sectional study which examined the condition of QOL among waiting list patients, more than 15 aged in Namazi hospital, Shiraz, Iran. This is the first hospital in Iran and even in the Middle East that the first liver transplantation was done on May 15 1993 [12], although now other hospitals do this treatment. Number of liver transplantation in this hospital until December 31, 2015 was 3191 people. Data gathering was done between November 2015 until March 2016.

# Target population of our study was total people more than 15 aged which were registered in the Office for Transplantation Coordination which were 1213 people. Based on α =0.05, R=0.2 and β=0.2 the sample size was 201 people. Inclusion criteria were more than aged people, preparation for study, and full consciousness. After taking consent the questionnaire gave them and after about 15 minutes it took form them. For some illiterate patients researcher read the statements one by one and recorded the patients' response.

# Regarding to aims of our study a questionnaire was designed which examined the psychosocial variables alongside demographic features. Demographic questionnaire included age, gender, ethnicity (Fars and Others), marital status (Single or Married), education level (Illiterate, under diploma, university), employment status (employee, self-employed, housekeeper, retried, others), monthly income (Under 1, 1-2, 2-3 million Tommans), insurance coverage (governmental health insurance, medical insurance, social security insurance), housing (personal, rental), and etiology of disease. In addition MELD score (Model for End-stage Liver Disease) was asked in this part. In addition, because these patient were from all of provinces of Iran, we added regional variable in this questionnaire. According to the latest classification the country was classified into 5 regions in Jun 2014 based on neighborhood. The questionnaire asked the participants their provinces.

# For evaluation the QOL we used the Chronic Liver Disease Questionnaire (CLDQ). This questionnaire useful option for measuring HRQL of patients with chronic liver disease in different parts of the world [13]. Health-related quality of life (HRQL) in chronic liver disease has already been cross-culturally adapted and validated into a number of different languages [14]. Mahmoudi et *al.* translated the questionnaire in Persian and examined its validation in patients waiting for liver transplantation which results showed that convergent validity was 100% for all domains, and the success rate for item discriminant validity was 95.8% (139/145), finally the internal consistency (Cronbach a) for the domains ranged from 0.65 to 0.89 [15]. This questionnaire includes abdominal symptoms (AB), Fatigue (FA), systemic symptoms (SY), activity (AC), emotional function (EM), and worry (WO) dimensions.

SPSS version 21 was used for analysis. Data analyses were carried out using descriptive statistics of frequency, mean, standard deviation as well as inferential statistics such as ANOVA, correlation Pearson, t-test, and logistic regression with 95% confidence intervals (CIs).

**Results**

Results showed that 210 patients were studied. 140 people (66.7%) were men and 70 (33.7%) were female. The general mean age of patients was 41.04 ± 13.54. The mean age of female and male were 45.19 ± 13.41 and 42.19 ± 13.56 respectively which was not significant statistically. Thirty and five patients (16.7%) were younger than 30, 44 patients (21.0%) were between 30-40, 54 patients (25.7%) were between 40-50, and 77 patients (36.7%) were more than 50 years old. In this study, 171 patients (81.4%) patients were married, 39 patients (18.6%) were single. The mean score of QOL was 3.59 ± 0.33. Table 1 shows all features of participants.

**(Here about table 1)**

Statistics analysis showed that QOL of male in EM dimension was more than female significantly (P=0.05). Patients with age lower than 30 years old in total score of CLDQ (p=0.05) and in dimensions of FA and SY had more scores than patients with more than 30 significantly (p=0.01). In addition single patients had lower WO than marrieds (p=0.05). Patients with lower BMI had more score in CLDQ (P=0.04) and in dimensions of ABM (p=0.008) and SY (p=0.01) compared patients with high BMI. Patients with Governmental Health Insurance had less WO than patients with others insurances and these patient had more EM (P<0.01). Patients who live in the region 3 Geographical in Iran had less CLDQ than others (p=0.04). In addition patients in region 4 Geographical had less WO and more CLDQ than others (p<0.01). About the etiology of disease patients with Wilson had more SYM and CLDQ than others (P<0.05). In addition HBV patients had more score in EM and less WO than others (P<0.05). Generally patients with cirrhosis etiology had less QOL compared others (Table 2).

**(Here about table 2)**

**Discussion**

The main goal of this study was to evaluate the QOL among liver transplant candidate in Iran. Results showed that the score of male in emotion was more than female significantly (P=0.05). Patients with age lower than 30 years old and patients with low BMI had more score of QOL (p=0.05). Single patients had lower worries than marrieds (p=0.05). Patients with Governmental Health Insurance had less worries and more emotions than patients with others insurances and these patient had more EM (P<0.01). In addition patients in region 4 Geographical had less WO and more CLDQ than others (p<0.01).

According to results men candidate had better EM condition compared to women. In fact male had better QOL compared female which can be related to their perspective and ability as well as their vulnerability against the diseases. It was shown QOL is frequently worse for females than for males [16]. This claim was shown in different issues such as couples with cancers [17], hurt failure patients [18], elder people [19], and diabetic patients [20].

About BMI and its effect on QOL a study showed maintenance of weight loss and exercise in overweight patients with liver disease results in a sustained improvement in liver enzymes, serum insulin levels, and quality of life [21]. Because the burden of obesity is primarily experienced as a physical problem [22]. Liver transplant candidates who are overweight have several problem about their activities and this effect their QOL.

About the better condition of patients with age of lower than 30 can say this patients have better condition generally. It was shown that older hospitalized people are in less levels of QOL compared others [23]. A study showed a weakly positive relationship between age and measures of psychosocial status and quality of life was observed [24]. However it seems that relationship between age and QOL is dependent to type of disease. For example breast cancer in women is exception and younger woman are in high risk of QOL due to their dependency to their health breast [25]. Also 2 qualitative study showed that who these young patient are worried about their disease [26, 27].

About the health insurance people were divided in three categories; 1. Social service insurance which includes the people who are generally workers in the context of Iran from working rule generally. 2. Health Insurance are for people who did not any health care insurance that after Health Sector Evolution Plan in Iran on 2014 they can use of this form insurance. 3. Governmental health insurance is about those people that generally have governmental job. According to results the second group had less WO, while the third group have more EM. We believe that this is related to their health insurance directly and their job indirectly. Because patients who had governmental health insurance were occupies of governmental institutions this form of insurance has had good view among the people of Iran. Indirectly because people that have health care insurance have a part of job security this effect on their WO and EM. In other words, health insurance here is related to other securities in their life. Thus the second group are the patients who had more WO and less EM compared to other groups. It was shown that health insurance status was associated with HRQOL over time, but not at baseline [28].

About the geographical situation results showed that region 3 of Iran (north and northwest provinces) had the lowest QOL significantly. This is related to their distance of the center of transplantation. Because this people are in the most distance of the Shiraz their QOL are in the lowest level. It means their accessibility for liver transplantation services was limited. Because standing in candidate list need to at least 3 travel to Shiraz their indirect costs were raised and this affect their QOL. In addition, it seems that because of poor accessibility these patient did not clear understanding of their turning for transplantation. This was confirmed with a similar study in America. The study showed ongoing geographic disparities in liver distribution is related to distance among the migrated liver transplantation candidate [29].

About the MELD score results showed that it could not measure quality of life in liver transplant candidates which is line of other study [30]. Also we found out that cirrhosis patients had less while other study showed that reduction in QOL is not differ markedly by type of disease [10].

**Conclusion**

This study showed that gender, age, region of living, BMI, and health insurance effect QOL of liver transplant candidates. Women, upper aged patients, patients with high BMI, and patients with health insurance had low QOL generally. Policies should consider to this variables with emphasis on decreasing stress and anxiety among these patients. In addition policies should have more consideration on the patients of three regional provinces of Iran (north and northwest provinces) for solve their problems because of their distance of the center of transplantation. Although recently other centers in Iran are active for liver transplantation that reduce this problem fairly, but the patients that are referred to Shiraz should be more considered.

**Conflict of interest**: Not declared

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| Table 1. Demographic and clinical characteristics of the study population | | | | |
| *Age (year)* | 41.04 ± 13.54 |  | ***Educational level*** |  | |
| Men/women | 140 (66.7)/70 (33.3) |  | Illiterate | 52 (24.8) | |
| *Ethnicity* |  |  | Under Diploma or Diploma | 100 (47.6) | |
| Fars | 119 (56.7) |  | University | 58 (27.6) | |
| Others | 91 (43.3) |  | ***Blood group*** |  | |
| *Marital status* |  |  | A | 78 (37.1) | |
| Single | 39 (18.6) |  | B | 41 (19.5) | |
| Married | 171 (81.4) |  | O | 77 (36.7) | |
| *Job* |  |  | AB | 14 (6.7) | |
| Employee | 39 (18.6) |  | ***Etiology of disease*** |  | |
| Self-employed | 54 (25.7) |  | Cirrhosis | 120 (57.1) | |
| Housekeeper | 44 (21.0) |  | Hepatitis B | 32 (15.2) | |
| Retired | 34 (16.2) |  | PSC | 14 (6.7) | |
| Others | 39 (18.6) |  | Wilson disease | 11 (5.2) | |
| *Family head* |  |  | Hepatitis C | 7 (3.3) | |
| Yes | 129 (61.4) |  | Malignancy | 7 (3.3) | |
| No | 81 (38.6) |  | Autoimmune hepatitis | 5 (2.4) | |
| *Monthly income (MT)* |  |  | Cryptogenic | 1 (0.5) | |
| Under 1 | 127 (60.5) |  | Others | 13 (6.2) | |
| 1 to 2 | 63 (30.0) |  | ***Depression/ anxiety/ Stress*** |  | |
| 2 to 3 | 20 (9.5) |  | Normal | 69(32.9)/ 48(22.9)/ 74(35.2) | |
| *Housing* |  |  | Mild | 31(14.8)/ 14(6.7)/ 24(11.4) | |
| Personal | 148 (70.5) |  | Medium | 52(24.8)/ 53(25.2)/ 42(20.0) | |
| Rental | 62 (29.5) |  | Sever | 22(10.5)/ 25(11.9)/ 33(15.7) | |
| *Insurance type* |  |  | Extremely severe | 36 (17.1)/ 70(33.3)/ 37(17.6) | |
| Governmental health insurance | 43 (20.5) |  | ***CLDQ score*** | 3.59 ± 0.33 | |
| Medical insurance | 49 (23.3) |  | Abdominal | 4.01 ± 1.97 | |
| Social Security Insurance | 118 (56.2) |  | Fatigue | 3.12 ± 1.66 | |
| *Supplemental insurance* |  |  | Systematic | 3.96 ± 1.53 | |
| Yes | 104 (49.5) |  | Activity | 3.73 ± 1.78 | |
| No | 106 (50.5) |  | Emotion | 3.68 ± 1.58 | |
| *Living place* |  |  | Worry | 3.02 ± 1.72 | |
| Urban | 190 (90.5) |  | ***Region in Iran*** |  | |
| Rural | 20 (9.5) |  | Region 1 | 54 (25.7) | |
| *Waiting list* (day), mean ± SE | 257.39 ± 28.06 |  | Region 2 | 73 (34.8) | |
| *Term illness* (year) | 5.98 ± 0.38 |  | Region 3 | 34 (16.2) | |
|  |  |  | Region 4 | 36 (17.1) | |
| *MELD score* | 18.63 ± 6.36 |  | Region 5 | 1. 6.2) | |

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| * MT, Million Toman ; MELD, Model for End-stage Liver Disease; BMI, Body Mass Index; HBV, hepatitis B virus; PSC, primary sclerosing cholangitis; , Data expressed as Number (percent); Mean ± SD. |

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| Table 2. The results of based on demographic and CLDQ in patients 0f the Waiting list in liver transplantation | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ariable | | | | **N(%)** | **AB** | | | | **FA** | | | **SY** | | | | | **AC** | | | | | | **EM** | | | | | **WO** | | | | | | **CLDQ- SCORE** | | | | | |
|  | Mean | | SD | | Mean | SD | | Mean | | SD | | | Mean | | SD | | | | Mean | | SD | | | Mean | | | SD | | | Mean | | SD | | | |
| Gender | | Female | | 70 (33.3) | 3.80 | | 2.02 | | 3.12 | 1.78 | | 3.68 | | 1.51 | | | 3.86 | | 1.88 | | | | 3.39 | | 1.50 | | | 2.88 | | | 1.59 | | | 3.46 | | 1.31 | | | |
| Male | | 140 (66.7) | 4.12 | | 1.95 | | 3.13 | 1.60 | | 4.10 | | 1.53 | | | 3.66 | | 1.73 | | | | 3.83 | | 1.61 | | | 3.08 | | | 1.79 | | | 3.65 | | 1.34 | | | |
| P value | | | | | 0.27 | | | | 0.97 | | | 0.06 | | | | | 0.45 | | | | | | 0.05 | | | | | 0.43 | | | | | | 0.31 | | | | | |
| Age | |  | | 35(16.7) | 4.44 | | 1.94 | | 3.92 | 1.81 | | 4.70 | | 1.67 | | | 4.28 | | 1.86 | | | | 3.90 | | 1.94 | | | 3.61 | | | 1.94 | | | 4.14 | | 1.61 | | | |
| 30-40 | | 44(21.0) | 4.18 | | 1.75 | | 2.76 | 1.49 | | 3.99 | | 1.22 | | | 3.95 | | 1.69 | | | | 3.56 | | 1.10 | | | 2.88 | | | 1.56 | | | 3.55 | | 0.92 | | | |
| 40-50 | | 54 (25.7) | 3.75 | | 1.98 | | 3.04 | 1.68 | | 3.71 | | 1.58 | | | 3.47 | | 1.74 | | | | 3.68 | | 1.67 | | | 2.76 | | | 1.60 | | | 3.40 | | 1.31 | | | |
|  | | 77 (36.7) | 3.90 | | 2.10 | | 3.02 | 1.58 | | 3.78 | | 1.53 | | | 3.54 | | 1.78 | | | | 3.66 | | 1.62 | | | 3.00 | | | 1.76 | | | 3.48 | | 1.36 | | | |
| P value | | | |  | 0.37 | | | | 0.01 | | | 0.01 | | | | | 0.10 | | | | | | 0.81 | | | | | 0.13 | | | | | | 0.05 | | | | | |
| Marital status | | Single | | 39 (18.6) | 4.35 | | 2.02 | | 3.52 | 1.99 | | 4.37 | | 1.71 | | | 4.10 | | 1.85 | | | | 3.81 | | 1.71 | | | 3.53 | | | 1.76 | | | 3.95 | | 1.58 | | | |
| Married | | 171 (81.4) | 3.93 | | 1.96 | | 3.03 | 1.57 | | 3.87 | | 1.48 | | | 3.65 | | 1.76 | | | | 3.65 | | 1.56 | | | 2.90 | | | 1.70 | | | 3.51 | | 1.26 | | | |
| P value | | | | | 0.24 | | | | 0.15 | | | 0.06 | | | | | 0.15 | | | | | | 0.57 | | | | | 0.03 | | | | | | 0.06 | | | | | |
| BMI | |  | | 19 (9.0) | 5.15 | | 1.60 | | 3.62 | 2.06 | | 4.88 | | 1.60 | | | 4.47 | | 1.75 | | | | 4.26 | | 1.62 | | | 3.61 | | | 1.57 | | | 4.33 | | 1.39 | | | |
| 18.5-25 | | 99 (47.1) | 4.12 | | 1.91 | | 3.14 | 1.70 | | 4.01 | | 1.49 | | | 3.71 | | 1.69 | | | | 3.59 | | 1.70 | | | 3.02 | | | 1.80 | | | 3.60 | | 1.33 | | | |
| 25-30 | | 63 (30.0) | 3.87 | | 2.01 | | 2.93 | 1.55 | | 3.82 | | 1.59 | | | 3.66 | | 1.79 | | | | 3.77 | | 1.37 | | | 2.90 | | | 1.64 | | | 3.49 | | 1.29 | | | |
|  | | 29 (13.8) | 3.21 | | 2.01 | | 3.15 | 1.48 | | 3.48 | | 1.34 | | | 3.49 | | 2.02 | | | | 3.42 | | 1.57 | | | 2.88 | | | 1.72 | | | 3.27 | | 1.29 | | | |
| P value | | | | | 0.008 | | | | 0.48 | | | 0.01 | | | | | 0.27 | | | | | | 0.28 | | | | | 0.44 | | | | | | 0.04 | | | | | |
| Insurance type | | Health insurance | | 43 (20.5) | 3.79 | | 2.12 | | 2.92 | 1.49 | | 3.82 | | 1.26 | | | 3.41 | | 1.56 | | | | 3.00 | | 1.33 | | | 2.51 | | | 1.32 | | | 3.24 | | 1.01 | | | |
| Medical insurance | | 49 (23.3) | 4.26 | | 2.14 | | 2.94 | 1.68 | | 3.84 | | 1.70 | | | 3.80 | | 1.84 | | | | 4.19 | | 1.71 | | | 3.53 | | | 1.80 | | | 3.76 | | 1.49 | | | |
| Social Security Insurance | | 118 (56.2) | 3.99 | | 1.85 | | 3.27 | 1.71 | | 4.06 | | 1.56 | | | 3.82 | | 1.83 | | | | 3.72 | | 1.54 | | | 2.99 | | | 1.77 | | | 3.64 | | 1.35 | | | |
| P value | | | | | 0.52 | | | | 0.34 | | | 0.54 | | | | | 0.41 | | | | | | 0.001 | | | | | .017 | | | | | | 0.14 | | | | | |
| Region in Iran | | Region 1 | | 54 (25.7) | 4.08 | 1.73 | | | 3.30 | 1.66 | | | 4.08 | | 1.51 | | | 3.81 | | 1.67 | | | | 3.65 | | 1.4 | | | 3.01 | | | 1.56 | | | 3.66 | | 1.28 | | | |
| Region 2 | | 73 (34.8) | 4.02 | 2.10 | | | 3.09 | 1.72 | | | 3.94 | | 1.62 | | | 3.58 | | 1.79 | | | | 3.81 | | 1.70 | | | 3.14 | | | 1.79 | | | 3.60 | | 1.38 | | | |
| Region 3 | | 34 (16.2) | 3.40 | 1.78 | | | 2.55 | 1.40 | | | 3.38 | | 1.40 | | | 3.44 | | 1.68 | | | | 3.17 | | 1.57 | | | 2.14 | | | 1.03 | | | 3.01 | | 1.14 | | | |
| Region 4 | | 36 (17.1) | 4.48 | 2.04 | | | 3.30 | 1.57 | | | 4.33 | | 1.40 | | | 4.23 | | 1.81 | | | | 4.05 | | 1.51 | | | 3.55 | | | 1.94 | | | 3.99 | | 1.31 | | | |
| Region 5 | | 13 (6.2) | 3.97 | 2.34 | | | 3.60 | 2.03 | | | 4.09 | | 1.65 | | | 3.64 | | 2.24 | | | | 3.41 | | 1.55 | | | 3.18 | | | 2.11 | | | 3.65 | | 1.49 | | | |
| P value | | | | | 0.25 |  | | | 0.19 | | | 0.11 | | | | | 0.35 | | | | | | 0.17 | | | | | 0.01 | | | | | | 0.04 | | | | | |
| Etiology of disease | HBV | | 32 (15.2) | | 4.31 | | | 2.07 | 3.64 | 1.79 | 4.36 | | | 1.51 | | 4.13 | | | | | 1.83 | 4.28 | | | 1.67 | | 3.74 | | | 1.82 | | | 4.08 | | | | | 1.45 |
| Cirrhosis | | 119 (56.7) | | 3.86 | | | 2.00 | 2.99 | 1.56 | 3.73 | | | 1.54 | | 3.57 | | | | | 1.74 | 3.42 | | | 1.51 | | 2.71 | | | 1.63 | | | 3.38 | | | | | 1.28 |
| Wilson | | 11 (5.2) | | 4.75 | | | 2.10 | 3.76 | 1.95 | 5.05 | | | 1.38 | | 4.30 | | | | | 1.87 | 4.22 | | | 1.98 | | 3.29 | | | 2.11 | | | 4.23 | | | | | 1.61 |
| Others | | 34 (16.2) | | 4.03 | | | 1.76 | 3.22 | 1.74 | 4.22 | | | 1.43 | | 3.66 | | | | | 1.86 | 3.83 | | | 1.64 | | 3.36 | | | 1.61 | | | 3.72 | | | | | 1.28 |
| P value | | | | | 0.56 | | | | 0.06 | | | 0.01 | | | | | 0.44 | | | | | | 0.05 | | | | | 0.02 | | | | | | 0.03 | | | | | |