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Predictors of Quality of Life in Patients with Asthma in Ahvaz, Iran

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Background: Asthma impacts the quality of life (QOL) of patients and their families. The magnitude of this morbidity is influenced by several factors, including age, disease duration, and others. This study was conducted to determine the predictors of quality of life in patients with asthma in Ahvaz, Iran.

Materials and Methods: This cross-sectional study was conducted among patients referred to the pulmonary clinics of Imam Khomeini and Golestan hospitals in Ahvaz in 2022. The quality of life was assessed using the SF-36v2 questionnaire. The effect of socio-demographic characteristics on quality-of-life scores was examined by t-test, one-way variance (ANOVA), Pearson's correlation coefficient, and regression models.

Results: From a total of 204 studied asthmatic patients, the average age of patients was 43.22±15.17 years. The average QOL in patients was 57.69±22.97. Physical role and social functioning had the lowest and highest mean scores among SF-36 dimensions, respectively. A significant difference was observed between the average QOL score and the variables of age, gender, education level, employment status, illness costs, illness severity, daily exercise, and number of visits ($P<0.05$). Most clinical, socio-demographic, and economic variables were predictors of SF-36, PCS, MCS, and QOL dimensions ($P<0.05$).

Conclusion: This study showed that the quality of life in asthmatic patients is affected by the severity of the disease, number of visits, age, sex, and education. By performing appropriate interventions on social and economic factors, the quality of life of asthmatic patients can be improved.

Keywords: Risk factors; Quality of life; Asthma

INTRODUCTION

Chronic respiratory diseases affect more than one billion people worldwide, including three hundred million people with asthma (1). Asthma is one of the most common chronic diseases in Iran and the world, the most important reason for referring to the emergency department, and the cause of significant disability, complications, and scattered deaths at all ages (2, 3). Global Burden of Disease studies have estimated that approximately 339 million people worldwide have asthma, and this number is expected to reach 400 million by 2025. Also, this disease causes the death of more than 1000 people per day (4, 5). The prevalence of asthma in women, men, and in general around the world is 10.28%, 9.32%, and 9.79%, respectively. Also, the prevalence of asthma in Iran is between 7.7 and 9.3%, and in the Eastern

Mediterranean region, between 5 and 10% (6, 7). The prevalence of asthma in the west of Iran, which includes Khuzestan, is also 4% (7). Also, the prevalence of asthma in Ahvaz city was between 10 and 12.5% (8).

The goal of health care for patients with chronic diseases is not only to reduce mortality but also to improve the quality of life (5). Asthma is a disease that can lead to different degrees of limitations in the physical, emotional, and social areas of the patient's life (2). This disease has an increasing burden in terms of complications, health care costs, and health-related quality of life (9), which harms the quality of life (10, 11). Quality of life is defined as a person's perspective of their position within the culture and value system in which they live, as well as their goals, expectations, standards, and concerns. For a complete picture of the patient's health status, conventional clinical indicators and health-related quality of life (HRQoL) should be evaluated (12). Health-related quality of life is defined as the functional effect of a disease and subsequent treatment as perceived by the patient. Health-related quality of life is considered a key indicator in guiding health policies (13). Also, measuring the quality of life is used for clinical decision-making and evaluating the effects of chronic diseases and various treatments (13, 14).

Asthma is affected by several factors that can aggravate or improve the condition and thus improve the patient's quality of life (5). Identifying predictive factors related to the quality of life of patients with asthma is essential for understanding the disease and its treatment it should provide meaningful information about the impact of the disease and its treatment on the perceived health of patients (9). Factors such as gender, age, body mass index (BMI), education level, place of residence, and socio-demographic parameters are related to the quality of life in patients with asthma (3, 9). Also, demographic characteristics (older age, female gender, low education level, and unemployment), clinical conditions (severity, hospitalization, and high safety level indicators), poor control and management, and co-morbidities are factors related to low quality of life in patients with asthma. (15-17). Lázár et al.'s study showed that gender, co-morbidities, disease symptoms, and smoking are relevant factors affecting the quality of life (18). Also, Shi et al.'s study showed that gender and income are related factors and predictors of quality of life in patients with asthma (19).

Measuring and identifying factors related to and predicting health-related quality of life is based on the recognition that health care should not only focus on patient survival but should also focus on quality of life. Also, this information can help guide clinical management, develop clinical guidelines, and allocate resources fairly (20).

Khuzestan province has been exposed to various pollutants for many years, the most important sources of which are fine, industrial, and non-industrial pollutants. The pollution level in Ahvaz (the capital of Khuzestan province) is getting more and more severe every day (8). According to a report by the World Health Organization in 2013, Ahvaz City was the most polluted city in the world in terms of the annual average of suspended particles less than 10 micrometers (372 micrograms per cubic meter) (21). Therefore, conducting a detailed study on the quality of life of asthma patients in Ahvaz seemed necessary. Therefore, this study was conducted to determine the related and predictive factors of health-related quality of life in asthma patients in Ahvaz City.

MATERIALS AND METHODS

Study setting and samples

This cross-sectional study was conducted over six months, from May 2022 to November 2022. The time of conducting the study was the conditions of the COVID-19 pandemic in the world. This study was conducted in the clinics of Imam Khomeini and Golestan general and teaching hospitals (a referral medical center for respiratory patients) in Ahvaz. Ahvaz, the capital of Khuzestan province, with an area of 185 square kilometers, is located at the geographical coordinates of 31.20 degrees north and 48.40 degrees east. With a population of over 1,300,000 people, Ahvaz is the seventh most populated city in Iran (22, 23).

At first, according to the size of the research population, the sample size was calculated as 195 people using Cochran's formula. Three hundred fifty people were asked to enter the study. Then, eligible patients who met

the inclusion criteria were identified and included in the study with the diagnosis of the study team doctor. The criteria for entering the study were having asthma for at least one year, being under active follow-up, and willingness to participate in the study. Also, the exclusion criteria of pregnant women (due to different effects of pregnancy on asthma), suffering from other respiratory diseases (pneumonia, COPD) and unstable heart failure (due to co-founding effects), missing or incomplete data, the existence of psychiatric problems or cognitive disorder, those who were unable to understand or complete the questionnaire and unwillingness to participate in the study. Finally, 204 patients were included in the study based on the inclusion and exclusion criteria.

Procedure

The data were collected by trained interviewers who visited the clinics of the specified hospitals daily, utilizing the available sampling methods. After receiving the necessary permits and going to the predetermined sampling centers, the patients who met the inclusion criteria were selected. Then, the interviewers collected data by introducing themselves and stating the study's objectives. Patients who did not read and write were informed with the help of the patient's companion or their parents. The data was collected during the COVID-19 pandemic. Due to the limitations of the COVID-19 pandemic and the special conditions of the population under study, compliance with prevention protocols was put on the agenda. A two-part questionnaire including demographic characteristics and SF-36 v2 was used to collect data. The demographic characteristics section of the questionnaire includes questions about social and economic characteristics [age, sex, education level, residential status, size of household, type of insurance, employment status, personal income (Riyals), and cost of illness (Riyals)], and clinical characteristics. The severity of the disease, the number of times the drug was taken (per day), smoking, family history, the number of visits (per month), underlying disease, the duration of daily exercise (in minutes), and the duration of the disease (in years) of the patients were evaluated. SF-36 v2 questionnaire was also used for patients' quality of life. SF-36 v2 questionnaire was used in various studies aimed at evaluating the quality of life of asthma patients (1, 3, 24).

SF-36 questionnaire v2

SF-36 v2 questionnaire includes 36 items and eight dimensions of physical performance (10 items) (PF), physical role (4 items) (RP), body pain (2 items) (BP), general health (5 items) (GH) vitality (4 items) (VT), social functioning (2 items) (SF), emotional role (3 items) (RE) and mental health (5 items) (MH) evaluate health-related quality of life. In addition, the SF-36 includes a question about the change in general health status compared to the previous year. Each concept can be scored from 0 to 100, where a higher score subjectively indicates a better quality of life. The questions of this questionnaire are on a Likert scale, where the number of answer options varies from two to six points depending on the item. For example, items 3 and 6 measuring physical functioning ranged from 1 (Yes, I am constrained) to 3 (Not limited at all). Items measuring physical role, such as 13 and 14, show dichotomous responses (1 yes and 2 no). Items measuring physical pain, such as the 22, show scores ranging from 1 (none) to 5 (extreme). Finally, items like 28 and 29, which measure mental health and quality of life, are scored from 1 (always) to 6 (never), respectively. Items are reverse-coded to have the same meaning. This questionnaire provides a complete assessment of overall quality of life (OQOL), physical component summary (PCS), and mental component summary (MCS). PF, RP, BP, and GH subscales form the physical component summary (PCS), and VT, SF, RE, and MH subscales form the mental component summary (MCS). Also, the sum of the physical component summary (PCS) and mental component summary (MCS) constitute the overall quality of life (OQOL) (1, 3, 24-28). The validity and reliability of the questionnaire were confirmed previously (27, 29). Cronbach's alpha for the eight subscales of this questionnaire in An et al.'s study was between 0.73 and 0.90 (27). Oliveira et al.'s study also calculated Cronbach's alpha for the eight subscales of this questionnaire between 0.7 and 0.9 (1). Also, in Chow et al.'s study, the Cronbach's alpha of this questionnaire was 0.88 (29). In Iran, the use and scientific validity of this questionnaire have been tested in several studies, and its

reliability has been reported as 0.82 according to Cronbach's alpha (30).

Statistical analysis

In this study, statistical analysis was done using SPSS Ver 22 software. Mean and standard deviation were used for descriptive data. Also, t-test, one-way variance (ANOVA), and Pearson's correlation coefficient were used to compare SF-36 scores with each other and their dimensions with socio-demographic, economic, and clinical variables. To identify variables predicting the quality of life of the studied patients, linear multivariate regression analysis was used in a step-by-step method. Regression coefficients were determined using the least squares method. Separate models were examined for SF-36, PCS, MCS, and OQOL dimensions.

Ethics approval

This study was approved by the Medical Ethics Committee of Ahvaz Jundishapur University of Medical Sciences with code IR.AJUMS.REC.1397.034. The confidentiality of patients' information, obtaining patients' consent, and receiving written consent from patients were observed. Patients consented to the clinical data and health outcomes they reported being used for research purposes.

RESULTS

The average age of patients was 43.22±15.17 years. The age of the patients was at least five, and at most 79 years. The highest treatment costs for patients had a median of 137.14 dollars, with 39.2% falling between 100 and 199 dollars. The highest individual income among patients was $400 or more, with a median of $342.86 and an interquartile range of 0, which represents 81.4% of the participants. The average number of family members of the patients was 5.01 people. Female patients (55.4%), diploma (36.8%), living in the city (83.3%), having social security insurance (59.8%), not having supplementary insurance (53.3%), and working (50.5%) were the most frequent patients (Table 1). Most patients had moderate disease severity (36.8%). However, patients with high disease severity (33.3%) also had a significant percentage, and the distribution of patients according to disease severity was close to each other. The findings in the clinical characteristics section showed that there was no family history (55.4%), no smoking (84.8%), and the presence of underlying disease (69.1%) in the majority of patients. The average number of drug intakes per day, the number of visits per month (Min=1, Max=10), the duration of exercise in minutes (Min=0, Max=120), and the duration of illness in years (Min=1, Max=60) were 1.76±2.37, 1.15±1.54, 24.86±12.95 and 7.83±7.20, respectively. 40.7% of patients took medicine twice a day, and 70.1% were visited by a doctor once a month. The findings showed that 64.7% of patients did not exercise at all. Also, the disease duration was 72.1% of patients under ten years (Table 2).

The findings showed that the average OQOL of the study participants was 22.97 ± 57.69. Also, the mean of PCS and MCS were 25.27±54.43 and 24.53±60.95, respectively. Among the dimensions of quality of life, they had the lowest and highest mean (44.18±45.10) RP and (31.01±70.23) SF, respectively. All dimensions of quality of life had a significant relationship and direct correlation with total quality of life (Table 3).

Table 1. Socio-demographic and economic characteristics of patients with asthma in Ahvaz, Iran (N=204)

Variables		Frequency	Percentage
Age (year)	<18	11	5.4
	18-39	72	35.3
	40-59	91	44.6
	≥60	30	14.7
Gender	Female	113	55.4
	Male	91	44.6
Level of Education	Illiterate	34	16.7
	Elementary	38	18.6
	Diploma	75	36.8
	University degree	57	27.9
Residence	Rural	34	16.7
	Urban	170	83.3
Family size	<3	37	18.1
	3-5	103	50.5
	>5	64	31.4
Type of Insurance	Social Security	122	59.8
	Healthcare Service	22	10.8
	Armed Forces	10	4.9
	Health of Iranians	26	12.7
	Other	24	11.8
Employment Status	Unemployed	101	49.5
	Employed	103	50.5
Personal income (dollars)	<400	166	81.4
	≥400	38	18.6
Cost of illness (dollars)	<100	70	34.3
	100-199	80	39.2
	≥200	54	26.5

Table 2. Clinical characteristics of asthma patients in Ahvaz, Iran (N=204)

Variables		Frequency	Percentage
Illness Severity	Mild	61	29.9
	Medium	75	36.8
	Severe	68	33.3
No. of Times to Take Medicine (per day)	1	59	28.9
	2	83	40.7
	3≥	62	30.4
Smoking	No	173	84.8
	I quit	17	8.3
	Yes	14	6.9
Family History	Yes	91	44.6
	No	113	55.4
Number of Visits (per month)	1	143	70.1
	2	37	18.1
	3≥	24	11.8
Underlying Disease	Yes	141	69.1
	No	63	30.9
Daily Exercise Duration (in minutes)	Nothing	132	64.7
	<20	34	16.7
	20-60	31	15.2
	60≥	7	3.4
Duration of Illness (in years)	<10	147	72.1
	≥10	57	27.9

The relationship between SF-36 scores and socio-demographic and economic characteristics in Table 4 showed that with increasing age, the score of PF, GH, MH, PCS, and MCS decreased (p=0.001). The difference in scores of PF, RP, BP, VT, MH, SF (p=0.05), PCS, and MCS was greater in men than in women (p=0.001). Increasing the level of education in patients had a positive effect on PF, VT, MH, and MCS scores (p=0.001). VT score (p=0.02) was higher in people living in the city than in rural people. No significant difference was found between the dimensions of the household and the type of insurance with the scores of the SF-36 dimensions (P>0.05). Employed people had significantly better scores in BP (p=0.02), VT (p=0.04), MH (p=0.001, and MCS (p=0.02) than unemployed people. Scores of high-income patients compared to low-income patients in BP (p=0.02) and MH (p=0.001) had a significant difference. With increasing patient treatment costs, the scores of PF (p=0.00), RP (p=0.01), BP (p=0.001), GH (p=0.01), PCS (p=0.001), and MCS (p=0.001) decreased significantly (Table 4). Also, the relationship between SF-36 scores and clinical characteristics of patients in Table 5 showed that there was a significant difference between the scores of all eight dimensions of quality of life, PCS, and MCS with the severity of the disease (p=0.001). So, the scores decreased with the increase in the severity of the disease. With the increase in the number of drug doses, scores of PF (p=0.02), BP (p=0.02), GH (p=0.001), SF (p=0.05), and PCS (p=0.001) decreased significantly. No significant difference was found between smoking in patients with SF-36 dimension scores (p>0.05). BP score (p=0.02) was significantly higher in people without a family history (Table 5). With the increase in the number of patient visits per month, the scores of PF (p=0.001), BP (p=0.04), VT (p=0.001), SF (p=0.01), PCS (p =0.02), and MCS (p=0.001) decrease significantly. With increasing the duration of daily exercise of the patients, the scores of PF (p=0.001), GH (p=0.01), VT (p=0.04), and PCS (p=0.001) increase significantly. There was a significant difference between the duration of the patient's illness and the scores of GH (p=0.01) and PCS (p=0.001) (Table 5).

The relationship between OQOL and socio-demographic and economic variables showed that as the age of patients increases, OQOL decreases significantly (p=0.001). So, patients under 18 years old and over 60 years old had the highest and lowest quality of life, respectively. There was a significant difference between the gender (p=0.001) and the employment status (p=0.03) of the patients with the OQOL score. So, OQOL is more prevalent in male and working patients. As the level of education in patients increases, OQOL increases significantly (p=0.03). The treatment costs of patients harmed OQOL (p=0.001), and with the increase in treatment costs, OQOL decreased significantly. No significant difference was found between the variables of residence status, size of household, type of insurance, and individual income of patients with OQOL (P>0.05) (Table 6).

The relationship between OQOL and clinical variables showed that the severity of the disease (p=0.001) and the

number of visits per month (p=0.001) have a negative effect on the patients' OQOL. So, with the increase in the severity of the disease and the number of visits, the OQOL of the patients decreases significantly. The findings showed that the OQOL (p=0.02) in the patients increases significantly with the increase in the duration of the patients' exercise per day. No significant difference was found between the variables of number of times of drug use (per day), smoking, family history, underlying disease, and duration of disease with OQOL (P>0.05) (Table 7).

Finally, to identify each independently related variable and predict the quality of life of the participants, linear multivariate regression analysis was used in a step-by-step method. Table 8 shows the coefficients of the multivariate linear regression models that evaluate the association and prediction of the study variables for each dimension of SF-36, PCS, MCS, and OQOL. The results showed that the clinical variables of disease severity, number of visits per month, smoking, family history, duration of disease, number of drug intakes per day, and background patient and socio-demographic and economic variables of gender, age, cost of disease, education level and employment status are predictors of SF-36, PCS, MCS and OQOL dimensions (Table 8).

The determination coefficients (R2) in multiple regression models of SF-36 dimensions showed that PF (R2=0.40) and RE (R2=0.14) had the highest and lowest determination coefficients (R2), respectively. The determination coefficients for PCS, MCS, and OQOL were 0.42, 0.28, and 0.40, respectively. This means that 42% of PCS changes, 28% of MCS changes, and 40% of OQOL changes are explained by variables in specific models (Table 8). Disease severity is present as a predictor variable in all multiple regression models. So, the severity of the disease from B=-9.60 to B=-23.20 causes a decrease in SF-36, PCS, MCS, and OQOL dimensions. After the severity of the disease, gender, number of visits per month, age, and smoking are the most essential variables in predicting OQOL, SF-36 dimensions, PCS, and MCS, respectively. The variables of disease severity, sex, age, and number of visits per month together predict 42% of PCS changes, and the variables of disease severity, sex, number of visits per month, and having an underlying disease together predict 28% of MCS. According to the value of B per unit of increase in disease severity, age and number of visits per month decrease OQOL by -4.08, -14.45, and -4.94, respectively. The variables of disease severity, sex, age, and number of visits per month together predict 40% of the changes in OQOL (Table 8).

Table 3. Quality of life questionnaire dimensions score (SF-36) and its relationship with total quality of life (OQOL) in patients with asthma in Ahvaz, Iran (N=204).

Dimensions of Quality of Life		Mean (SD)	Min	Max	P value	Pearson correlation coefficient
Physical Functioning	PF	61.60(28.50)	0	100	0.001	0.74**
Role Physical	RP	45.10(44.18)	0	100	0.001	0.76**
Bodily Pain	BP	63.73(31.63)	0	100	0.001	0.74**
General Health	GH	47.30(22.00)	0	100	0.001	0.68**
Role Emotional	RE	57.68(46.21)	0	100	0.001	0.76**
Vitality	VT	56.13(23.62)	0	100	0.001	0.76**
Mental Health	MH	59.77(22.88)	0	100	0.001	0.67**
Social Functioning	SF	70.23(31.01)	0	100	0.001	0.70**
Physical Component Summary	PCS	54.43(25.27)	3.75	100	0.001	0.92**
Mental Component Summary	MCS	60.95(24.53)	0	99	0.001	0.92**
Overall Quality of Life	OQOL	57.69(22.97)	2.5	98.89	-	-

Table 4. Quality of life dimension score (SF-36) based on socio-demographic and economic characteristics in patients with asthma (N=204)

Variables		PF		RP		BP		GH		PCS	
		Mean (SD)	P	Mean (SD)	P	Mean (SD)	P	Mean (SD)	P	Mean (SD)	P
Age	<18	89.09(20.71)	**0.001**	77.27(36.15)	0.08	77.95(28.06)	0.32	64.54(24.23)	**0.01**	77.22(24.90)	**0.001**
	18-39	66.53(22.99)		43.40(44.80)		64.48(33.03)		47.36(21.80)		55.44(24.43)	
	40-59	61.48(28.13)		44.78(44.02)		63.52(30.92)		47.75(20.71)		54.38(24.16)	
	≥60	40.00(30.96)		38.33(42.92)		57.33(31.17)		39.50(22.68)		43.79(25.80)	
Gender	Female	54.74(30.04)	**0.001**	38.05(42.92)	**0.01**	55.44(31.37)	**0.001**	44.82(22.51)	0.07	48.26(25.70)	**0.001**
	Man	70.11(24.02)		53.85(44.40)		74.01(28.95)		50.38(21.06)		62.09(22.61)	
Level of Education	Illiterate	42.79(31.31)	**0.001**	41.91(42.95)	0.3	57.50(33.13)	0.12	44.26(22.73)	0.43	46.62(26.89)	0.06
	Elementary	66.97(25.18)		46.05(48.11)		65.53(35.51)		43.95(22.84)		55.62(28.49)	
	Diploma	62.00(27.75)		39.33(42.74)		60.60(30.15)		47.93(22.21)		52.47(23.23)	
	University degree	68.69(25.38)		53.95(43.76)		70.35(29.34)		50.53(20.71)		60.88(23.51)	
Residence	Rural	56.18(32.38)	0.23	42.65(43.31)	0.72	64.34(35.73)	0.90	44.85(22.44)	0.48	52.00(28.12)	0.54
	Urban	62.68(27.64)		45.59(44.46)		63.60(30.85)		47.79(21.94)		54.92(24.72)	
Family size	<3	53.51(28.98)	0.13	38.51(44.3)	0.50	55.54(33.39)	0.07	40.00(21.85)	0.08	46.90(25.43)	0.08
	3-5	62.28(28.07)		44.90(43.77)		62.72(32.40)		48.59(23.34)		54.62(25.76)	
	>5	65.16(28.45)		49.22(44.97)		70.08(28.36)		49.45(19.13)		58.48(23.72)	
Type of Insurance	Social Security	63.00(28.06)	0.91	46.93(43.66)	0.5	66.19(31.76)	0.34	47.70(21.96)	0.5	55.95(25.25)	0.51
	Healthcare Service	61.60(27.22)		47.73(42.89)		62.04(26.59)		50.23(21.35)		55.40(18.35)	
	Armed Forces	56.00(31.78)		30.00(43.77)		44.75(32.07)		36.50(22.97)		41.81(27.45)	
	Health of Iranians	59.42(27.83)		34.62(45.32)		63.17(34.51)		49.42(19.45)		51.66(25.37)	
	Other	59.17(32.82)		47).51.04(47		61.25(31.32)		44.79(25.08)		54.06(29.77)	
Employment Status	Unemployed	58.12(30.73)	0.08	42.57(44.93)	0.42	58.74(32.80)	**0.02**	45.74(23.17)	0.32	51.29(27.20)	0.08
	Employed	65.00(25.83)		47.57(43.51)		68.62(29.78)		48.83(20.78)		57.50(22.93)	
Personal Income	<400	60.28(29.17)	0.18	42.53(43.44)	0.09	61.00(32.23)	**0.01**	47.65(22.17)	0.65	52.87(25.72)	0.07
	≥400	67.00(25.16)		55.63(46.16)		74.94(26.51)		45.87(21.50)		60.86(22.47)	
Cost of Illness	<100	71.57(24.69)	**0.001**	55.22(44.06)	**0.04**	75.70(26.37)	**0.001**	55.52(19.63)	**0.001**	64.50(23.27)	**0.001**
	100-199	58.82(27.34)		43.44(43.34)		58.34(30.96)		44.81(19.60)		51.35(22.49)	
	≥200	53.77(31.28)		35.53(43.80)		57.19(34.60)		41.14(25.08)		46.91(27.74)	
Variables		**RE**		**VT**		**MH**		**SF**		**MCS**	
		Mean (SD)	P	Mean (SD)	P	Mean (SD)	P	Mean (SD)	P	Mean (SD)	P
Age	<18	90.91(30.15)	0.45	85.00(17.03)	0.16	84.36(11.38)	**0.001**	79.77(29.48)	0.30	85.01(15.07)	**0.001**
	18-39	61.11(44.76)		57.08(21.26)		58.44(23.29)		70.83(31.82)		61.87(24.04)	
	40-59	53.48(47.11)		54.72(23.37)		58.90(21.67)		71.57(30.17)		59.67(23.86)	
	≥60	50.00(47.75)		47.50(24.56)		56.57(24.27)		61.25(31.72)		53.83(25.94)	
Gender	Female	52.51(46.89)	0.07	49.91(24.07)	**0.001**	55.80(23.16)	**0.001**	66.48(32.18)	**0.05**	56.17(24.82)	**0.001**
	Man	64.10(44.79)		63.84(20.71)		64.70(21.66)		74.89(28.99)		66.89(22.94)	
Level of Education	Illiterate	44.12(46.94)	0.13	46.18 (24.00)	**0.04**	52.24(20.79)	**0.04**	64.71(29.75)	0.37	51.81(22.01)	**0.03**
	Elementary	54.39(49.27)		55.00 (25.97)		56.11(25.67)		67.17(36.66)		58.17(27.82)	
	Diploma	58.22(46.20)		58.87 (22.88)		60.71(24.45)		70.17(32.28)		62.00(25.46)	
	University degree	67.25(42.48)		59.21 (21.58)		65.47(18.43)		75.66(25.37)		66.90(20.83)	
Residence	Rural	50.98(48.01)	0.36	47.79(25.64)	**0.02**	54.47(24.71)	0.14	65.44(33.85)	0.32	54.67(27.90)	0.10
	Urban	59.02(45.87)		57.79(22.91)		60.83(22.42)		71.19(30.42)		62.21(23.69)	
Family size	<3	53.15(47.44)	0.34	53.24(23.63)	0.71	57.30(25.29)	0.77	69.59(31.53)	0.63	58.32(25.61)	0.54
	3-5	55.01(45.90)		56.94(24.51)		60.50(23.97)		68.59(32.63)		60.26(25.49)	
	>5	64.58(45.95)		56.48(22.35)		60.01(19.67)		73.24(28.16)		63.58(22.36)	
Type of Insurance	Social Security	54.92(47.12)	0.4	57.25(23.75)	0.25	60.95(22.42)	0.08	71.52(31.21)	0.84	61.16(24.88)	0.3
	Healthcare Service	75.76(37.34)		60.68(21.39)		68.00(21.05)		73.30(29.45)		69.43(22.80)	
	Armed Forces	56.67(49.81)		49.00(27.76)		53.60(28.97)		66.25(29.49)		56.38(24.71)	
	Health of Iranians	53.85(45.29)		47.88(20.84)		50.46(20.95)		64.90(30.82)		54.27(22.98)	
	Other	59.72(48.13)		58.12(25.22)		58.87(24.03)		68.33(33.72)		61.26(25.24)	
Employment Status	Unemployed	51.82(48.64)	0.07	52.77(25.68)	**0.04**	54.98(24.13)	**0.001**	67.97(31.87)	0.3	56.88(25.63)	**0.02**
	Employed	63.43(43.16)		59.42(21.01)		64.46(20.64)		72.45(30.13)		64.94(22.82)	
Personal income	<400	57.11(46.37)	0.72	55.27(24.15)	0.3	58.20(23.20)	**0.04**	68.61(31.82)	0.13	59.80(24.97)	0.17
	≥400	60.00(46.03)		59.63(21.22)		66.20(20.55)		76.87(26.78)		65.67(22.28)	
Cost of illness	<100	66.17(43.22)	0.15	61.27(22.16)	0.08	63.52(19.02)	0.14	75.60(25.38)	0.17	66.64(20.85)	**0.04**
	100-199	55.83(46.77)		54.62(23.02)		59.71(22.21)		69.22(31.19)		59.85(23.58)	
	≥200	50.29(48.02)		52.19(25.40)		55.44(27.21)		65.35(35.98)		55.82(28.57)	

Table 5. Quality of life dimension score (SF-36) based on clinical characteristics in patients with asthma (N=204)

Variables		PF		RP		BP		GH		PCS	
		Mean (SD)	P	Mean (SD)	P	Mean (SD)	P	Mean (SD)	P	Mean (SD)	P
	Mild	77.95(25.40)	**0.001**	68.03(41.36)	**0.001**	75.45(25.43)	**0.001**	60.49(18.34)	**0.001**	70.48(21.54)	**0.001**
Illness Severity	Medium	65.34(23.73)		50.00(41.71)		72.50(29.27)		49.80(18.62)		59.41(21.29)	
	Severe	42.79(25.36)		19.12(35.64)		43.53(29.67)		32.72(20.02)		34.54(18.81)	
Number of Times to Take	1	65.68(26.33)	**0.02**	52.54(46.35)	0.06	70.12(31.22)	**0.02**	52.88(20.55)	**0.001**	60.31(24.13)	**0.001**
Medicine	2	65.06(28.18)		47.89(44.03)		66.02(31.48)		48.67(22.53)		56.91(25.33)	
(per day)	≥3	53.06(29.49)		34.27(40.79)		54.55(30.62)		40.16(21.01)		45.51(24.21)	
	No	62.81(28.52)	0.35	47.54(44.43)	0.15	63.66(30.35)	0.09	47.54(21.97)	0.66	55.39(25.10)	0.44
Smoking	I quit	55.88(30.06)		35.29(44.24)		61.91(39.37)		42.94(27.38)		49.00(28.65)	
	Yes	53.57(25.97)		26.79(37.29)		66.79(38.85)		49.64(14.73)		49.20(23.35)	
Family History	Yes	59.51(29.87)	0.35	48.08(44.91)	0.39	58.82(33.29)	**0.04**	47.53(23.73)	0.89	53.48(26.88)	0.63
	No	63.28(27.37)		42.70(43.64)		67.68(29.79)		47.12(20.60)		55.19(23.99)	
Number of Visits	1	64.89(26.49)	**0.001**	48.43(44.32)	0.07	67.15(30.95)	**0.04**	48.08(21.08)	0.72	57.14(24.79)	**0.02**
(per month)	2	59.18(32.47)		44.59(45.69)		58.31(31.70)		44.86(23.81)		51.74(27.70)	
	≥3	45.62(29.01)		26.04(37.21)		51.67(32.71)		46.46(24.99)		42.45(20.75)	
Underlying Disease	Yes	64.08(27.21)	0.06	46.28(44.41)	0.57	64.80(30.67)	0.47	49.11(22.49)	0.08	56.07(25.20)	0.17
	No	56.03(30.69)		42.46(43.91)		61.31(33.81)		43.25(20.46)		50.76(25.23)	
	Nothing	57.53(28.72)	**0.001**	42.61(44.52)	0.22	61.65(30.95)	0.07	45.16(22.20)	**0.03**	51.74(24.72)	**0.01**
Daily Exercise Duration	<20	64.27(27.47)		40.44(43.08)		60.15(36.13)		47.35(23.03)		53.05(26.58)	
(in minutes)	20-60	69.03(25.27)		55.64(43.16)		70.88(29.393)		51.61(16.40)		61.79(23.38)	
	≥60	92.14(18.67)		67.86(42.60)		88.58(16.57)		68.57(24.95)		79.28(21.58)	
Duration of Illness	<10	63.64(26.68)	0.1	46.94(43.88)	0.34	66.02(32.14)	0.09	50.24(21.17)	**0.001**	56.71(24.33)	**0.04**
(in years)	≥10	56.32(32.39)		40.35(45.00)		57.80(29.72)		39.74(22.48)		48.55(26.87)	
Variables		**RE**		**VT**		**MH**		**SF**		**MCS**	
		Mean (SD)	P	Mean (SD)	P	Mean (SD)	P	Mean (SD)	P	Mean (SD)	P
	Mild	74.32(40.54)	**0.001**	68.20(22.45)	**0.001**	69.90(19.05)	**0.001**	81.80(22.37)	**0.001**	73.55(20.55)	**0.001**
Illness Severity	Medium	64.44(43.61)		56.53(20.26)		60.05(22.23)		72.00(30.05)		63.26(22.23)	
	Severe	35.29(45.66)		44.85(22.88)		50.37(23.07)		57.90(34.48)		47.10(23.52)	
Number of Times to Take	1	59.88(45.81)	0.88	55.76(24.27)	0.59	59.45(22.38)	0.61	72.25(30.00)	**0.05**	61.84(24.41)	0.78
Medicine	2	55.82(46.00)		58.01(22.85)		58.27(23.95)		74.73(29.77)		61.71(24.01)	
(per day)	≥3	58.06(47.50)		53.95(24.17)		62.06(22.04)		62.30(32.52)		59.09(25.60)	
	No	58.38(46.19)	0.45	57.43(23.61)	0.16	61.25(22.04)	0.09	70.90(30.70)	0.24	61.99(23.98)	0.26
Smoking	I quit	45.09(48.50)		50.88(23.66)		52.47(28.10)		58.82(34.73)		51.82(31.23)	
	Yes	64.29(44.26)		46.43(22.13)		50.29(24.03)		75.89(29.19)		59.22(21.42)	
Family History	Yes	60.81(45.43)	0.39	56.04(25.45)	0.96	60.71(24.42)	0.59	66.20(33.25)	0.09	60.94(27.04)	0.99
	No	55.16(46.88)		56.19(22.15)		59.00(21.65)		73.47(28.82)		60.96(22.43)	
Number of Visits	1	62.00(45.20)	0.07	59.37(20.59)	**0.001**	62.16(21.41)	0.07	73.27(29.07)	**0.01**	64.20(22.33)	**0.001**
(per month)	2	52.25(48.77)		51.62(28.31)		55.13(24.35)		69.93(32.73)		57.23(27.53)	
	≥3	40.28(45.02)		43.75(28.17)		52.67(27.19)		52.60(34.77)		47.32(27.61)	
Underlying Disease	Yes	60.28(46.10)	0.23	58.09(23.69)	0.08	61.30(23.30)	0.18	73.78(29.80)	**0.01**	63.34(24.45)	**0.04**
	No	51.85(46.28)		51.74(23.05)		56.52(21.73)		62.30(32.41)		55.60(24.04)	
	Nothing	57.07(46.51)	0.44	53.37(23.90)	**0.001**	57.77(23.29)	0.06	69.60(31.16)	0.63	59.45(24.63)	0.09
Daily Exercise Duration	<20	54.90(46.33)		54.71(22.72)		59.76(25.04)		66.54(33.67)		58.98(26.06)	
(in minutes)	20-60	56.99(46.50)		63.23(19.68)		63.74(16.49)		75.40(27.85)		64.84(20.61)	
	≥60	85.71(37.80)		83.57(17.49)		80.00(20.26)		77.14(30.63)		81.61(24.62)	
Duration of Illness	<10	59.64(45.53)	0.33	57.52(22.38)	0.18	60.24(22.85)	0.63	71.79(30.71)	0.25	62.30(24.07)	0.21
(in years)	≥10	52.63(47.95)		52.54(26.42)		58.54(23.13)		66.23(31.69)		57.49(25.55)	

Table 6. Total quality of life score (OQOL) based on socio-demographic and economic variables in patients with asthma in Ahvaz, Iran (N=204)

Variables	Classification	Mean	SD	Confidence interval (95 percent)		T or F	P value
				High	Low		
Age	<18	81.11	19.31	94.09	68.13	5.75	**0.001**
	18-39	58.66	21.39	63.68	53.62		
	40-59	57.03	22.18	61.64	52.40		
	≥60	48.81	25.00	58.14	39.47		
Gender	Female	52.22	23.39	-6.10	-18.43	-3.92	**0.001**
	Man	64.49	20.62				
Level of Education	Illiterate	49.21	22.80	57.17	41.25	3.04	**0.03**
	Elementary	56.90	26.74	65.68	48.10		
	Diploma	57.23	21.78	62.24	52.21		
	University degree	63.89	20.58	69.34	58.42		
Residence	Rural	53.33	26.33	3.27	-13.72	-1.21	0.23
	Urban	58.56	22.22				
Family Size	<3	52.60	23.42	60.41	44.79	1.60	0.21
	3-5	57.44	23.90	62.11	52.77		
	>5	61.03	20.86	66.24	55.81		
Type of Insurance	Social Security	58.55	23.02	62.68	54.42	0.90	0.47
	Healthcare Service	62.41	18.54	70.63	54.19		
	Armed Forces	49.09	24.52	66.63	31.55		
	Health of Iranians	52.96	22.05	61.87	44.05		
	Other	57.66	26.62	68.90	46.42		
Employment Status	Unemployed	54.09	24.65	-.85	-13.41	-2.24	**0.03**
	Employed	61.22	20.71				
Personal Income	<400	56.33	23.34	1.01	-14.88	-1.72	0.09
	≥400	63.26	20.73				
Cost of Illness	<100	65.57	20.29	70.52	60.62	6.81	**0.001**
	100-199	55.60	20.98	60.27	50.92		
	≥200	51.36	26.17	58.30	44.41		

Table 7. Total quality of life score (OQOL) based on clinical variables in patients with asthma in Ahvaz, Iran (N=204)

Variables	Classification	Mean	SD	Confidence interval (95 percent)		T or F	P value
				High	Low		
Illness Severity	Mild	72.01	19.27	76.95	67.08	44.46	**0.001**
	Medium	61.33	19.95	65.92	56.74		
	Severe	40.82	18.34	45.26	36.38		
Number of Times to Take Medicine (per day)	1	61.07	22.92	67.04	55.09	2.60	0.08
	2	59.31	23.03	64.34	54.28		
	≥3	52.30	22.34	57.97	46.63		
Smoking	No	58.69	22.49	62.06	55.31	1.18	0.31
	I quit	50.41	29.22	65.44	35.38		
	Yes	54.20	20.08	65.81	42.61		
Family History	Yes	57.21	24.72	5.53	-7.26	-0.27	0.80
	No	58.07	21.56				
Number of Visits (per month)	1	60.67	21.29	64.19	57.15	5.52	**0.001**
	2	54.49	26.54	63.33	45.64		
	≥3	44.88	22.69	54.47	35.30		
Underlying Disease	Yes	59.70	22.71	13.34	-0.30	1.89	0.06
	No	53.18	23.08				
Daily Exercise Duration (in minutes)	Nothing	55.59	22.41	59.45	51.73	3.46	**0.02**
	<20	56.02	24.64	64.61	47.41		
	20-60	63.32	21.02	71.03	55.60		
	≥60	80.45	21.49	100.00	60.56		
Duration of Illness (in years)	<10	59.50	22.02	13.51	-0.54	1.82	0.07
	≥10	53.02	24.87				

Table 8. Predictors of health-related quality of life in patients with asthma (N=204)

Dependent variable	predictor variables	B	Beta	P	Confidence interval (95 percent)		R^2
					Low	High	
PF	Constant	109.84		0.001	92.47	127.20	0.40
	Illness severity	-15.69	-0.43	0.001	-19.62	-11.75	
	Age	-9.78	-0.27	0.001	-13.75	-5.80	
	gender	12.36	0.21	0.001	6.11	18.60	
	Number of visits per month	-5.60	-0.13	0.02	-10.08	-1.09	
RP	Constant	80.47		0.001	58.03	102.91	0.24
	Illness severity	-23.20	-0.42	0.001	-29.98	-16.42	
	gender	18.86	0.21	0.001	7.49	30.22	
	Smoking	-12.65	-0.16	0.01	-22.86	-2.44	
BP	Constant	57.63		0.001	38.80	76.46	0.26
	Illness severity	-16.02	-0.40	0.001	-20.78	-11.26	
	gender	17.11	0.27	0.001	9.50	24.73	
	family history	8.97	0.14	0.02	1.35	16.58	
GH	Constant	92.18		0.001	82.28	102.08	0.33
	Illness severity	-12.29	-0.44	0.001	-15.57	-9.00	
	duration of illness	-6.95	-0.23	0.001	-10.30	-3.60	
	cost of illness	-3.74	-0.13	0.03	-7.07	-0.40	
RE	Constant	78.44		0.001	55.32	101.55	0.14
	Illness severity	-19.42	-0.34	0.001	-26.92	-11.93	
	Level of Education	6.79	0.15	0.02	1.05	12.54	
VT	Constant	83.39		0.001	68.03	98.76	0.32
	Illness severity	-9.60	-0.32	0.001	-13.09	-6.11	
	gender	15.09	0.32	0.001	9.22	20.96	
	Smoking	-7.84	-0.18	0.001	-13.13	-2.54	
	Number of visits per month	-5.96	-0.17	0.001	-9.93	-1.99	
	Age	-4.29	-0.14	0.02	-7.87	-0.72	
MH	Constant	81.21		0.001	69.06	93.36	0.23
	Illness severity	-10.02	-0.35	0.001	-13.67	-6.38	
	Employment status	12.40	0.27	0.001	6.65	18.16	
	Smoking	-7.05	-0.17	0.001	-12.25	-1.85	
	Number of visits per month	-4.89	-0.15	0.02	-9.04	-0.75	
	Number of times to take the medicine per day	4.09	0.14	0.03	0.32	7.86	
SF	Constant	92.50		0.001	74.85	110.15	0.16
	Illness severity	-10.79	-0.28	0.001	-15.81	-5.76	
	Number of visits per month	-1.28	-0.17	0.02	-2.24	-0.32	
	gender	-6.73	-0.15	0.03	-12.50	-0.96	
PCS	Constant	88.32		0.001	73.15	103.48	0.42
	Illness severity	-16.93	-0.53	0.001	-20.37	-13.50	
	gender	11.85	0.23	0.001	6.40	17.31	
	Age	-4.08	-0.12	0.02	-7.55	-0.61	
	Number of visits per month	-3.95	-0.10	0.04	-7.88	-0.03	
MCS	Constant	81.20		0.001	68.23	94.16	0.28
	Illness severity	-12.20	-0.39	0.001	-15.89	-8.50	
	gender	10.66	0.22	0.001	4.76	16.56	
	Number of visits per month	-5.92	-0.16	0.001	-10.15	-1.67	
	The underlying patient	-0.09	-0.15	0.01	-1.59	-0.18	
OQOL	Constant	90.00		0.001	76.00	104.00	0.40
	Illness severity	-14.45	-0.50	0.001	-17.62	-11.28	
	gender	10.41	0.22	0.001	5.38	15.45	
	Number of visits per month	-4.94	-0.15	0.001	-8.56	-1.32	
	Age	-4.08	-0.14	0.01	-7.29	-0.88	

DISCUSSION

Asthma is a chronic and non-communicable disease with a high global burden, which leads to a high rate of absenteeism from work and school, as well as an increase in emergency room visits and hospitalizations (12). Quality of life (QoL) is a term that has been widely studied in asthma because it allows the impact of the disease on the patient's life to be evaluated through the patient's perception (31). In the last two decades, HRQoL assessment has gained a prominent role in the

management (treatment and control) of asthma. Adherence to drug treatment and symptom control, as well as self-perceived physical, emotional, and social well-being, play an essential role in effective disease management (12). The purpose of this study was to determine the related and predictive factors of health-related quality of life in asthma patients in Ahvaz.

Based on the results of this study, the quality of life score of the studied participants was 57.69. Also, the scores of PCS and MCS were 54.43 ± 25.27 and 60.95 ± 24.53, respectively. Many studies have been conducted on the quality of life of patients. The study of Rabitabar et al. (32) and Abbasi et al. (33) showed different results in this regard, 56.32 ± 11.69 and 70.47 ± 9.30, respectively. Also, in the study of Kalmarzi et al. (34), the quality of life score of patients in a pilot study in the experimental and control groups was reported to be 51.50 ±19.78 and 46.25 ± 18.26, respectively. Also, different results were reported in the studies regarding the score of different aspects of the patient's quality of life according to the factors affecting them. PCS and MCS scores in the study of Rask-Andersen et al. (35), Song et al. (36), and Patil et al. (37) were (49.1±10.7, 59±5.15), (43.2±0.3, 48.4±0.2) and (47.43 ± 15.56, 66.71±13.59), respectively. In a study in Iran, the PCS and MCS scores were reported to be 58.8±18.3 and 57.3±17, respectively. It was consistent with the results of the present study.

The results of this study showed that RP (45.10± 44.18) and SF (70.23 ± 31.01) had the lowest and highest scores among the dimensions of quality of life. In the study by Malek et al. (3), BP (73.8±22) and RE (46±31) they have had the highest and lowest scores, respectively. Also, Adams et al. (39) showed that BP (67±30.8) and PF (24 ± 25.1) had the highest and lowest scores among other aspects of patients' quality of life. However, another study (37) showed that GH (39.11±12.79) and RE (80.86±28.17) had the lowest and highest scores, respectively. The difference in the results of studies evaluating the quality of life of patients is caused by the influence of different variables. The severity of disease, delivery of medical services, and sociocultural conditions are the key factors that affect the quality of life score. In this study and other similar studies, the minimum and maximum scores belonged to the physical and mental dimensions, respectively. Physical dimensions have a more significant impact on the quality of life due to the effects of the disease on the body and physical limitations. Therefore, by improving physical performance and taking measures to reduce the effects of disease on the body, the quality of life can be increased. Also, physical dimensions have a significant impact on psychological dimensions.

The findings showed that there was a significant difference among all the variables (except for the household size, type of insurance, and smoking), at least with the score of one of the dimensions, components, and overall quality of life. No significant difference was observed between the score of variables of the household dimension, type of insurance, and smoking with any of the dimensions and components and the total score. A study showed that there was a significant difference between PCS and MCS scores and age, and no significant difference was found with smoking, which is consistent with the results of the present study (35). Another study showed that no significant difference was found between the PCS and MCS scores with the residence status and education level, while there was a significant difference with age, which is consistent with the results of the present study (3). Contrary to the result of the present study, in one study, no significant difference was found between PCS and MCS scores with gender (3). A study showed that there was a significant difference between the average scores of the quality of life in all dimensions, PCS and MCS, with the severity of asthma, so that the quality of life decreased with the severity of the disease (1), which was consistent with the results of the present study. Another study showed the same as the present study, the duration of the illness, and unlike our study, marital status, education level, employment status, residence status, and income were related to the PCS score (38). Also, in the present study, gender, education level, unlike previous studies, and employment status, as in previous studies, were

related to the MCS score (38). A study showed that no significant difference was found between the average OQOL and the variables of age, sex, and residence status. At the same time, there was a significant difference between the variables of income, marital status, and daily exercise (40). Another study showed that no significant difference was found between the average OQOL and the variables of age, gender, and marital status. At the same time, there was a significant difference in the variables of education level, type of insurance, income, smoking, and daily exercise (24). In a study, it was observed that there was no significant difference between the average OQOL and the variables of gender, age, income, education level, marital status, employment status, smoking, and sports activities, while there was a significant difference with underlying diseases (13). The study of Santos et al. (42), unlike the present study, showed that smoking has a significant relationship with the OQOL of the patients and causes a decrease in their OQOL. Although in this study, the quality of life in non-smoking patients is higher than in smoking patients, no statistically significant relationship was found. Contrary to this study, another study (43) showed that there is no significant relationship between the variables of age, sex, marital status, education level, and employment status with patients' OQOL. The review of various studies showed that the quality of life in patients with asthma, like this study, had a significant relationship with age, gender, marital status, education level, employment status, and disease severity (20, 45, 46, 47). Also, the results of other studies, contrary to the results of this study, showed that age, sex, income, and smoking were not related to the quality of life in patients (9, 20, 47). In general, poor economic and social status and low educational level are the factors influencing the low quality of life of asthma patients, which is consistent with the results of the present study (41).

The comparison of the results of this study with other studies shows that social, economic, and clinical variables are related to PCS, MCS, and OQOL scores and affect the quality of life. The reason for the similarities and differences in the results of the studies can be due to the difference in the population under study, the severity and stage of the disease in the patients, the living environment, and individual conditions. Also, the level of expectations, the level of general well-being, and the physical and mental resilience of people can be adequate in relating these variables to the quality of life, and one of the reasons for the similarities and differences between the results of this study and other studies. Therefore, to improve and increase the quality of life of patients, interventions and programs should be done according to the role and influence of these factors.

The present study showed that disease severity, gender, number of visits per month, and age are predictors of OQOL and PCS. Also, variables of disease severity, sex, underlying disease, and number of visits per month are predictors of MCS. In the present study, predictive variables were identified for all SF-36 dimensions. Adams et al.'s study (39) showed that the age variable was predictive of patients' quality of life in all dimensions of SF-36, and the gender variable was predictive of quality of life in PF and MH dimensions. In the present study, age was only a predictor of the dimensions of PF and VT, and the gender variable in this study was the predictor of PF, as in the mentioned study (39). Song et al.'s study (36) showed that the variables of age, gender, and severity of the disease were predictors of PCS as in the present study. Also, unlike the present study, residence status, education level, income, insurance (general type), and smoking were among the predictors of PCS. This study (36) showed that the variables of age, gender, as in the present study, and the level of income and smoking were predictors of MCS, unlike the present study. In various studies, the variables of age, sex, education level, income, and severity of asthma are predictive factors of the quality of life in patients with asthma, as in the present study (11, 19, 45, 48). Unlike the present study, other studies showed that the variables of age, gender, economic status, smoking, disease duration, and disease severity are not predictors of quality of life in asthmatic patients (11, 48). The comparison of the results of

this study and other studies shows that socio-demographic, economic, and clinical factors predict the quality of life in asthma patients. Therefore, the quality of life of these patients can be increased with appropriate changes and interventions on the variables.

Life with asthma has many aspects and different variables affect the person in this regard. Psychological factors, physical health factors, and multifactorial aspects are among the factors that affect asthma patients and their quality of life, and it was found that these factors directly and indirectly affect self-management. Also, the level of activity and other outcomes have a significant impact on the quality of life of patients with asthma (49). The findings indicate the complex and negative effects of health and psychological factors on the quality of life in asthma. Also, self-management with regular support reduces the use of healthcare resources and improves the quality of life at all levels of asthma severity (50). Therefore, investing in self-management and self-care skills training can be one of the most essential measures to improve the quality of life of asthma patients.

This study had some limitations and strengths. This study was conducted cross-sectionally, and it was impossible to measure changes in the quality of life during different stages of the disease. Also, due to difficult access, the physical and mental conditions of the patients were not assessed in a large volume. Another limitation of this study was the cultural and ethnic differences of the participants. One of the strengths of this study was the use of the SF-36 questionnaire as a valid tool to assess the quality of life, its implementation in the only treatment centers for respiratory patients in Ahvaz, and the examination of numerous demographic, social, and clinical variables in the patients.

CONCLUSION

Despite effective treatments for asthma patients, the results of the present study showed that the HRQOL of patients is poor. The low quality of life in patients with severe asthma, with a high number of visits, the elderly, women, people with low education, and high treatment costs is significant. PCS quality of life score in patients was lower than MCS, which shows that physical dimensions have a more significant impact on low quality of life in patients than mental dimensions. This result shows that it is necessary to focus on the physical health of patients to improve HRQOL. Clinical variables (severity of the disease, number of visits per month, smoking, family history, duration of the disease, number of drug intakes per day, and background patient) and socio-demographic and economic variables (gender, age, cost of the disease, education level and employment status) were among the predictors of SF-36, PCS, MCS and OQOL dimensions. Suitable interventions can significantly improve patient outcomes. These can include training on how to manage the disease, reducing physical symptoms, preventing disease progression, and enhancing living conditions. Additionally, providing financial aid through pharmaceutical, therapeutic, and nutritional packages can help increase resilience. Overall, these methods can lead to improvements in patients' health-related quality of life HRQOL.

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Conflict of interest

The authors of this article have no conflict of interest.

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