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THE CORRELATION BETWEEN CHRONIC DISEASES AND QUALITY OF LIFE AMONG THE ELDERLY

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Introduction and objective: Increased life expectancy is one of the achievements of the 21st century accompanied by the growing trend of chronic diseases. This study attempted to investigate the relationship between chronic diseases and quality of life among the elderly living in South East of Iran in 2015.

Materials and methods: This was a cross-sectional, descriptive and analytical study on 425 people aged 60 years and older living in South-East of Iran. The sampling was multi-stage, while the research tool involved the abridged Persian version ofSF-36 questionnaire and the history of chronic diseases checklist. Data were analyzed through descriptive statistics, t-test, chi-square and Pearson correlation coefficient.

Findings: The mean age of the elderly under study was 70.17±7.56. Moreover, %82.4 of the elderly suffered from at least one chronic disease. There was a significant statistical difference between the mean scores of the quality of life of patients with chronic diseases and healthy elderly (p<001.0). The quality of jobs was significantly correlated in most of the dimensions with education level, income and economic situation (p<05.0).

Conclusions:

The findings suggested that the increasing number of chronic illnesses reduces quality of life. Proper training in order to encourage the elderly can be effective in adopting healthy behaviors aimed at promoting health.

Keywords: Chronic Diseases, Quality of Life , Elderly

Introduction

Nowadays, increasing life expectancy and reducing mortality have led to greater population of the elderly worldwide. In fact, aging is one of the most important public health challenges in the world today (Lee *et al.*, 2006). Life expectancy has increased in the world owing to lower mortality rates, improved public health and dramatic medical advances (Esmaeili Shahmirzadi *et al.*, 2012).

Chronic diseases are considered the leading cause of disability and death in many countries (Witham *et al.*, 2007). Chronic diseases persist in patients for a long time, requiring longer periods of treatment. This can escalate the demand for health services which will soar so long as the chronic disease has not been completely uncontrolled. This in turn may deteriorate the quality of life (Lima *et al.*, 2009).

Chronic diseases are currently causing 68% of all deaths in the world, and it is likely that they account for more than 68% of the global burden of diseases by 2020 (Cumbie *et al.*, 2004). Estimates suggest that the number of elderly peoplein the world will hit one billion by 2020. On average, 16% of the population are elderly in industrialized countries, which is predicted to further increase in the coming decades (Blazer, 1982). According to the Statistical Center of Iran census 2006, the number of the elderly people over 60 years was about 5.1 million accounting for about 7.3% of the population (Jadidi *et al.*, 2011).

The increasing number of elderly people with a disability or dysfunction and lack of support systems due to smaller families, employed women and scattering of family members will increase the demand for long-term care and deteriorated quality of life among the elderly over the coming decades (Majdi *et al.*, 2011).Quality of life refers to the best measure of a person's energy or force consumed to achieve successful adaptation to the current challenges. There are several factors contributing to the quality of life among seniors, including the insufficiencies of old age that decreases the cognitive consistency and deteriorates self-reliance (Tajvar *et al.*, 2008).Generally, with increasing age there is greater risk of chronic diseases and disability at final years of life (Heydari *et al.*, 2012).

As the population ages, the risk of living with chronic diseases such as type 2 diabetes, cardiovascular disease and osteoporosis aggravates (Canbaz *et al.*, 2003). Chronic diseases will give rise to clinical, social and psychological problems, which in turn lead to numerous physical activity and mental limits, increasing dependence and the need for nursing care, all of which can lead to decreased quality of life (Povlsen and Ivarsen, 2005). The World Health

Organization has defined quality of life as individual understanding of one's position in life in terms of culture, system of values, goals, expectations, standards and priorities (Isikhan *et al.*, 2001).

However, quality of life is affected by problems such as the gradual loss of vision, hearing and memory and increased incidence of chronic diseases. Low economic prosperity and income of seniors can affect their access to food, adequate housing and health care (Chehregosha *et al.*, 2015).Loneliness and seclusion in the elderly is associated with decreased levels of physical and mental health. Although several studies have been done regarding quality of life among the elderly in different countries (Dragomirecká *et al.*, 2008), limited data in this regard compelled the researchers to examine the relationship between chronic diseases and the quality of life in this region. Nonetheless, the advantage of this study over the previous ones lies in the fact that the current study not only evaluated additional components concerning the quality of life in the elderly, but also examined the relationship between chronic diseases and the quality of life among the elderly.

Methodology:

This was a cross-sectional analytical study conducted in 2015. The population included 425 patients 60 years of age and older living in south-East of Iran. The inclusion criteria were age 60 years and older, willingness and informed consent to participate in the study, having mental alertness and ability to answer questions, no history of mental problems diagnosed by doctors. The exclusion criteria were applied to seniors with conditions such as speech impairment, severe hearing loss, and lack of consciousness, dementia and Alzheimer's disease, temporal and spatial disorientation. The sample size was calculated through the formula $N= z_1\text{-}\alpha/2^2\ p(1\text{-}p)\ /d^2$ assuming that 50% of the elderly had desirable quality of life (Shojaeizadeh, 2011). In order to find the maximum sample size d=0.05 and confidence interval of 95% was approximately 384, which was curtailed through design effect by 2% to 8%, leaving a total of 425 subjects.

This study involved a multi-stage sampling. Given the availability of household records for the elderly people at health centers, 14 out of 47 health centers were randomly selected for the study. At this stage, 7 clusters from the urban health centers and 7 other clusters from the rural health centers were randomly selected. The required samples were selected in proportion to the population size. Then potential bias was minimized by selecting all elderly patients randomly from all the respective centers.

Finally, the demographic data and quality of life dimensions were collected through a standardized questionnaire face-to-face interview at the subject's door, where the checklist of chronic diseases was filled out by the department of the health

of the elderly based on the health records. Data were collected through SF36, which is a comprehensive short questionnaire widely used as an instrument to measure health status and quality of life in the world. This scale entails a high level of reliability and validity. In Iran, the reliability and validity of the Persian version was assessed by Montazeri et al. (2005). The reliability was evaluated through internal consistency, while the validity was evaluated through known-groups comparison and convergence, calculated to be 0.9 and 0.77, respectively. All data were collected through a standard questionnaire filled by face to face interview and a checklist designed by medical professionals(Knurowski *et al.*, 2005). Then, the history of diseases including cardiovascular diseases, chronic low back pain, joint pain, high blood pressure, depression and anxiety, osteoporosis, type 2 diabetes, high blood fat, cancer, depression, digestive diseases were obtained based on the elderly's health records by physicians according to a checklist previously compiled by the health center physicians.

The data collection questionnaire consisted of two sections. The first section involved seven demographic items such as age, gender, occupation, education level, marital status, monthly income and place of residence. Items No. 1, 2 and 7 were two-option, while Items 4, 5 and 6 were six-option.

The second section involved a total of 36 items concerning the quality of life.Data were collected by SF36 questionnaire. The Quality of Life Questionnaire comprised two subscales with 18 items where physical health had 4 subscales of physical functioning entailing 10 items on a 3-point Likert scale, limited effective role-playing entailing four 2-point items, general health had two 5-point items, physical pain had two 6-point items, while the Mental Health Inventory included four subscales of freshness and vitality with 9 items on a 6-point Likert scale, Social Functioning Scale with two 5-point Likert scale, role-playing influenced by emotional problems with four 5-point items, and mental health scale involving three 4-point items.

Quality of life scores were calculated for the eight domains of health-related quality of life scores converted to scores ranking from zero to hundred. In each dimension, a score of zero indicated the lowest level of quality of life and a score of hundred indicated the highest level of quality of life.

The study area was the South East of Iran, starting in 2015. Data were analyzed through descriptive statistics, and appropriate statistical tests including T-test, Chi-square and Pearson correlation coefficient. All seniors participating in the study were assured of confidentiality of the information contained in the questionnaires.

Findings:

Of a total of 425 elderly participants in this study, 238 patients (56%) were male and 187 (44%) were female. The Mean (SD) age of the elderly was 70.17±7.56. The mean age of women was 69.342±7.627 while the mean age of men was 70.846±7.583. Moreover, 70.8% (301 people) of elderly were in the age group of 60 to 74 years and 29.2% (124) were in the age group of 75 years and beyond.

Table 1: Distribution of chronic diseases in the elderly population by gender

Gender / Number of diseases	Male		Female		Total		Nonparametric test
	Number	Percentage	Number	Percentage	Number	Percentage	
One disease	68	28.6	45	24.1	114	26.6	Df=423 t=776 p>0.438
Two diseases	50	21	37	19.8	87	20.5	
Three diseases	27	11.3	34	18.2	61	14.4	
Four diseases and more	48	20.2	40	21.4	88	20.7	
Healthy	44	18.5	31	16.6	75	17.6	
Total	238	100	187	100	425	100	

* There was no statistically significant relationship (T= test)

Based on the results obtained in Table 1. 82.4%(n=350) of the elderly population were suffering from at least one chronic disease, of whom 26.6% (n=114) had one disease, 20.5% (87) had two diseases, 14.4% (n=61) had three diseases, and finally 20.7% (n=88) had four diseases and more while only 17.6% (n=75) were healthy.

Table 2: Frequency distribution of chronic diseases by type of disease among the elderly population (n=425).

Type of disease	Absolute frequency	Relative frequency (%)
Chronic low back pain	121	21.5
Cardiovascular disease	77	18.1
Arthritis	74	17.4
High blood pressure	44	10.4
Respiratory diseases	8	1.9
Depression	7	1.6
Diabetes	5	1.2

Cancer	5	1.2
Osteoporosis	4	0.9
Digestive disorders	3	0.7
High blood fats	1	0.2
Heart attack	1	0.2

According to the findings (Table 2), the highest percentage of chronic diseases affects the subjects were chronic low back pain (21.5%), cardiovascular diseases (18.1%), joint pain (17.4%) and hypertension (10.4%), respectively.

Table 3: The quality of life dimensions among the elderly in the population.

Gender	Male		Female		Total		Nonparametric test
Quality of life dimensions	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation	
Health status	50.756	16.208	50.427	16.025	50.611	16.109	p>0.835 t=208 df=423
Physical functioning	65.005	20.112	63.750	19.34	64.453	19.632	p>0.514 t=0.653 df=423
Physical problems	56.612	38.233	57.620	38.259	57.058	38.203	p>0.789 t=268 df=423
Physical pain	45.672	24.776	42.352	23.413	44.211	24.221	p>0.161 t=1.404 df=423
*General health	54.495	13.823	51.791	14.080	53.305	13.985	*p<0.048 t=1.986 df=423
Vitality	65.869	10.275	66.262	12.260	66.042	11.231	p>0.726 t=358 df=423
Social functioning	64.369	22.299	62.673	22.512	63.623	22.382	p>0.439 t=0.775 df=423

Psychological problems	58.683	38.935	57.753	38.0711	58.274	38.514	p>0.805 t=0.427 df=423
Mental health	68.991	21.617	66.738	22.612	68.000	22.063	p>0299 t=1.045 df=423
All dimensions of quality	58.940	8.0136	57.707	7.029	58.324	7.521	p>0.098 t=1.660 df=423

(t-test ,p<0.05*)

As shown in Table 3, the overall score for quality of life was 58.940±7.521%, where the highest mean scores for quality of life were obtained for mental health, vitality, physical functioning, social functioning, and mental health problems, while the lowest scores were obtained for physical problems, mental health, health status and physical pain. The results of t-test showed that except for public health in a statistically significant correlation with gender (P<0.05), the rest of quality of life dimensions were not in a statistically significant correlation with gender.

Table 4: Relationship between quality of life and demographic characteristics of the elderly population.

Demographic variables	Quality of life	Mean	Standard deviation	Test result
Age	60-74	58.236	7.160	t=-629
	≥75	58.189	8.629	p>0.530
Gender	Male	58.940	8.013	t=1.660
	Female	57.708	7.029	p>0.098
Education level	Illiterate	58.457	7.735	f=0.322
	Elementary	57.963	7.193	p>0.863
	Elementary school	60.054	6.125	
	Diploma	57.521	1.891	
	College associate	53.573	0.349	
Marital status	Married	58.523	7.527	t=-171
	Single	58.360	8.200	p>0/865
	Widow/divorced	57.624	7.501	

	Very weak	57.624	7.501	f=2.561
	Weak	59.460	7.830	*p<0.027
Economic status	Average	60.792	7.745	
	Good	60.249	6.479	
	Excellent	59.195	7.868	
	Other	54.682	6.820	
	Worker	59.008	7.215	f=3.632
	Employee	57.068	5.919	*p<0.003
Job	Storekeeper	63.396	4.834	
	Unemployed	61.726	7.695	
	Unemployed	57.446	7.699	
Living place	Urban	58.368	7.814	t=-087
	Rural	58.432	7.393	p>0/931

T-test is correlated t-test *

The results obtained in Table 4 indicated a significant relationship between quality of life and economic status and income using one-way analysis of variance in all eight dimensions (P<0.027). In fact, the seniors who had low economic status had lower QOL compared to those who were healthy. There was a significant relationship between the QOL and occupation (P<0.003). In fact, employed people had higher life quality than unemployed people. There was a significant relationship between the level of education and chronic diseases. In fact, as with education level grows, there will be lower risk of chronic diseases (P<0.021). There was a statistically significant relationship between chronic diseases and jobs evaluated using t-test (P<0.004), where employed people were less likely to get affected by chronic diseases than unemployed people. There was no significant correlation between the place of residence, marital status and gender with chronic diseases and QOL.

Table 5: Comparing the mean of QOL and chronic diseases in the elderly population (n=425).

Chronic diseases	Patient		Healthy		Result of t-test
Quality of life dimensions	Mean	Standard deviation	Mean	Standard deviation	
*Physical functioning	61.957	18.764	76.101	19.514	t=5.882 p<0.001

*Physical problems	62.214	36.488	33.000	37.026	t=-6.276 p<0.001
*Psychological problems	62.285	37.764	39.555	36.635	t=-4.755 p<0.002
*Mental health	66.000	22.031	77.333	19.819	t=4.112 p<0.001
*Physical functioning	38.857	20.975	69.2000	22.765	t=11.196 p<0.001
*Vitality	64.943	11.054	71.170	10.682	t=4.453 p<0.001
	60.114	21.457	80.000	19.727	t=7.413 p<0.001
*General health	54.671	13.066	46.933	16.293	t=4.443 p<0.001
*Total dimensions	57.662	7.734	61.834	5.949	t=5.202 p<0.001

T-test relationship if significant*

According to the results (Table 5), the t-test revealed that chronic diseases were significantly correlated with all of QOL dimensions including physical function, physical pain, general health, vitality, social functioning, emotional problems, mental health and quality of life (P<005.0). Moreover, the mean scores for the quality of life dimensions among healthy elderly patients were higher than those among the elderly with chronic diseases.

The findings of this study showed that the quality of life and chronic diseases were significantly correlated in all dimensions of QOL(P<0.001). In fact, with the increase in chronic diseases there will be lower QOL.

Table 6: The correlation between the two dimensions of overall physical-mental health and chronic diseases.

Mental health	Physical health	Quality of life Statistical correlation	
-.901	-0.552	Pearson's correlation coefficient	Number of chronic diseases
*p<0.025	*p<0.001	Probable value	

Pearson test* Significant relationship

The findings in Table 6 indicated that the Pearson's correlation coefficient revealed a negative relationship between the number of chronic diseases and physical-mental health. With regard to values, the relationship between mental health and chronic diseases was stronger than the relationship between physical health and chronic diseases.

Discussion:

These findings suggest that all dimensions of quality of life among the elderly people were significantly correlated with chronic diseases. In fact, the mean scores in all eight dimensions of quality of life among healthy elderly were higher than the elderly with at least one chronic disease. The results of a study by Vahdaninia et al. aiming to assess health-related quality of life among the elderly in Tehran were consistent with those of this study (Vahdaninia *et al.*, 2005).Moreover, the study by Alonso et al. (2004) as an international research project to investigate the quality of life of chronic diseases in eight countries including Italy, Norway, US, Japan, Germany, Denmark, France and the Netherlands also indicated that the quality of life for people with chronic diseases are worse than others not reporting chronic diseases (Alonso *et al.*, 2004). In their study, Crouchley et al. (2007))Crouchley et al., 2007) and Artacho (2014) (Artacho et al., 2014) in Granada, Spain and Lahariyac et al. (2012) in India (Lahariya et al., 2012) and George et al. in Singapore (2014) and a survey conducted by Parke et al. (2014) (George et al., 2014)suggested that with the increasing number of chronic diseases, there will be a significant decrease observed in mean scores of quality of life dimensions (Parker et al., 2014(. These indicated that increased number of chronic diseases caused negative effects on health-related quality of life among the elderly, which was consistent with the current study where the increasing number of chronic diseases so curtailed the level of quality of life. Hence, the chronic disease affect all dimension of life quality among the elderly, leading to disability and reduced ability to live independently and require long-term care. In this context, people need to change their habits and their health behaviors, take disease prevention and health promotion measures. With the approach of intervention and appropriate training in topics such as healthy eating, physical activity, chronic disease risk factors, disability and old age as well as by encouraging seniors to adopt healthy behaviors to improve their health. In this respect, the use of self-care educational programs and engage the elderly in health programs can promote self-care and improve quality of life. Moreover, a planned intervention by healthcare providers aimed at improving the health status of the elderly can enhance the quality of life regardless of age and health services quality, serving to improve functioning, delay disability and emphasize prevention of complications in the elderly.

The results of this study showed that there is a significant relationship between quality of life and economic status. In fact, people with better economic conditions tend to have higher quality of life than those with average and lower economic level. Because in old age due to illness and lower functioning, the cost of care and treatment escalates, which can face the elderly with deeper problems if they are not affordable. The study by JU and Kim et al. (2015) (Ju and Kim, 2015) and Yang et al. (2013) (Yang et al., 2013) in China, and the study conducted by Janicki et al. (2014) (Janicki and Dalton, 2014) in Belgrade and Lee et al. (2014) and a survey conducted by Marmot et al. (2008) (Marmot *et al.*, 2008), consistent with the results of this study. It is clear that in this era of growing children, family costs including college tuitions, marriage health care costs are increasing. Meanwhile, the elderly people have lost their capabilities or got retired, in either case there will be lower income and financial crisis, as well as low income levels, quality of life and health. The financial and livelihood issues are all factors that affect the quality of life for the elderly aggravated by chronic diseases. These factors can put the elderly in trouble when they are supposed to be resting and reaping the fruits of their lives.

The results obtained in this study shows the impact of changing jobs and quality of life in a statistically significant relationship, consistent with the results obtained from the study by Abbasi Moghaddam et al. (Abbasimoghadam et al., 2009). Overall, the results of the current study indicated a statistically significant positive correlation between high income and jobs. Many previous studies reported similar results (Szwarcwald *et al.*, 2005). The study by Rossato's , et al. (2013) in Brazil was about the services provided and quality of life and jobs (Rossato et al., 2013). Lee et al. (2014) obtained results consistent with those obtained by the current one (Lee et al., 2014(. Nevertheless, most elderly rely economically on other because of job loss. On the other hand, increased medical costs each year can reduce the ability of seniors to pay for medical costs, especially those without health insurance. Eventually, lack of jobs and income will reduce the quality of life in elderly, while being employed increases the chances of regular income and maintaining quality of life in aging. It should be noted that in the past people had a regular government job and higher welfare and income, gaining access to more health services and facilities.

In examining the impact of level of education, the findings showed that the prevalence of chronic diseases was in a significant correlation with education, where the seniors with higher education showed lower prevalence of the diseases than those with lower education. In their study on the elderly living in west Tehran, Habibi et al. found that an increased level of education improves lives and better health. However, the higher the education level the higher the satisfaction

with life among the elderly and chronic diseases are less common. The lower the level of education the higher the risk of chronic diseases. Hence, education is more effective to have a healthy life consistent with the result of this study (Habibi *et al.*, 2008).

Concerning the effect of changing jobs with chronic diseases, the findings showed that the quality of life and health were in a significant correlation with occupation. Employment increases regular income and maintains the quality of life and health in the elderly.

It should be noted that in the past people had a regular government job and higher welfare and income, gaining access to more health services and facilities. Many previous studies reported similar results (Esmaeili Shahmirzadi *et al.*, 2012). This was consistent with the result of this study.

According to the results of this study by Pearson test, there was a significant relationship between physical and mental health with chronic disease ($p<05.0$).In this study, as chronic diseases increased, all eight dimensions of quality of life reduced. Furthermore, Crouchley et al. (2007) found that with an increase in the number of chronic diseases, there will be a significant decrease in scores on quality of life dimensions (Crouchley *et al.*, 2007). This was consistent with the result of this study.

Conclusions: The results of this study showed that with an increase in chronic diseases there will be negative effects on the health related quality of life. With the increasing number of chronic diseases there will be decreased quality of life. Due to the growing number of elderly patients with chronic diseases, it is crucial that healthcare providers initiate intervention programs aimed at changing habits and health behaviors for the prevention of disease and promotion of public health. The limitations of this study included lack of regular visit to the doctor, poor information about health status on the part of the elderly and cross-sectional nature of this study.

Competing Interests

The authors declare that they have no competing interests.

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