

THE RELATIONSHIP BETWEEN LOCOMOTIVE SYNDROME AND QUALITY OF LIFE IN THE ELDERLY

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ABSTRACT**BACKGROUND**

Locomotive system diseases during aging are causes of disability. Locomotive syndrome is a condition where the elderly depends on nursing care for self-care or will be at risk in near future. This syndrome leads to impairment in daily functioning and self-care, loss of autonomy, dependence and movement constraints.

The aim of this study was to investigate the association between locomotive syndrome and quality of life in the Qaemshahr elderly.

MATERIALS AND METHODS

This study is a descriptive study and from the thesis by available sampling. This study was performed on 120 Iranian elders in 2017. Data collection was done using demographic questionnaire, Geriatric Locomotive Function Scale questionnaire (GLFS-25) and European Quality of Life questionnaire (EQ-5D). Data were analysed using SPSS V23, t-test, Chi-square and R-correlation coefficient.

RESULTS

According to the results, there was a positive correlation between the scores of the GLFS-25 and EQ-5D questionnaires and a negative correlation with the visual level of health ($p= 0.01$). Also, level of quality of life in two groups with locomotive syndrome and without locomotive syndrome were significantly different (mean differences=-3.3, $p= 0.01$).

CONCLUSION

Early diagnosis of LS leads to prevention of physical and psychological effects, increasing the quality of life, reducing the cost of treatment and reducing families and community burden.

KEY WORDS

Locomotive Syndrome, Quality of Life, Elderly.

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BACKGROUND

The elderly population will increase from 10.5% in 2007 to 21.8% in 2050.⁽¹⁾ By 2050, the population of the elderly of Iran will be 5 times and it will reach more than 25 million.^(2,3) Aging population needs the preparation and predictions in health system policies.⁽⁴⁾ From a biological point of view, aging is a total of physiological, psychological, progressive and calm events that begin after puberty and cause structural and functional changes. These changes make the elderly more susceptible to the disease than younger.⁽⁵⁾ Increasing life

expectancy without disability is an important indicator in assessing the level of public health and the capabilities of a community. Diseases of the locomotive system are one of the causes of the disability in elderly. Most of these problems are related to the musculoskeletal system.⁽⁶⁾ The locomotive syndrome is referred to as the condition that the elderly is dependent on nursing services for self-care or in the future, while this condition is related to impaired functioning of one of the motor and motion-dependent organs.^(7,8) In recent years, special attention has been paid to the quality of life of the elderly, its dimensions and relation with other health conditions. According to the WHO definition, quality of life, people's perception of their position in life from the point of view of their community's culture and values, goals, expectations, standards and priorities.⁽⁹⁾ Evaluating the quality of life is an effective method for assessing their functional independence. Diseases of the locomotive system cause chronic pain in the joints, impairment in daily functioning and self-care, limitation of mobility, dependence and loss of autonomy, and ultimately a reduced quality of life.^(6,10,11) The aim of this study was to determine the association between LS and quality of life among elderly residents in the Qaemshahr County.

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MATERIALS AND METHODS

This study is part of a Descriptive study and approved by the Ethics Committee of Tehran University of Social Welfare and Rehabilitation Sciences. Samples were collected from the elderly in various urban spaces with available convenient sampling method, based on inclusion and exclusion criteria during the period from July 2017 to August 2017. The sample size study was determined according to correlation analysis. Considering the results of previous studies and one-sided research hypothesis, the lowest R was considered equal to 0.3 ($\alpha = 0.05$, $\beta = 0.05$). As the formula 116 samples were needed, which the researcher sampled 120 people. In this study, 120 elderly residents in the Qaemshahr county (60 ≥, 74 men, 46 women) participated in the study to determine the relationship between locomotive syndrome and quality of life.

Inclusion Criteria

1. Individuals ≥ 60 years old of either sex.
2. Individuals who can check and answer questionnaires by themselves.
3. The satisfaction to participate in the research.
4. Life in Iran and Persian language ability.

Exclusion Criteria

1. Individuals who are unable to walk without assistance from another person.
2. Individual with brain disease or severe cardiovascular, pulmonary or renal disease.
3. Individuals with mental illness.
4. Individuals with the history of fractures of the lower extremities and/or spine within the preceding 6 months.
5. Individuals who are receiving treatments for acute trauma.

The demographic questionnaire, the Geriatric locomotive function scale-25 and the European quality of life questionnaire were used. The locomotive questionnaire was created by the Japanese Orthopedic Association in 2012. The questionnaire contains 25 questions including 4 questions for pain assessment, 17 questions related to daily activities and the quality of life of the elderly, and 4 questions related to social and psychological functioning. Each item is rated 0 to 4 on a Likert scale. Total score is 0 to 100 points.^(6,7) More points mean more movement impairment. Cut-off point is 16. Individuals with a score of 16 upward are in the group with LS. The psychometric of tool in Iranian elderly have been confirmed. The reliability results in the test-retest method and Cronbach's alpha were 0.84 and 0.93, respectively,⁽¹²⁾ ($p = 0.01$). European quality of life questionnaire was used to assess the quality of life of the elderly. This standard questionnaire has five questions related to quality of life, which assesses five dimensions of mobility, self-care, lifestyle activities, pain, anxiety and depression. The questionnaire is scored on a 3-point scale from 0 to 2 points. Reliability of the tool by test-retest and validity and variance analysis showed that this questionnaire has credibility in Iranian elderly.⁽¹³⁾ The validity and reliability of the questionnaire for various components have been reported from 0.77 to 0.88. The Cohen coefficient of Kappa is obtained between 0.61 and 1.⁽¹⁴⁾ EQ-5D questionnaire is shorter than other quality of life questionnaires. This tool is translated into 172 languages. Self-perceive Health (VAS) rating scale from 0

to 100, which is marked by the participant. A higher score on the chart represents more health.⁽¹⁵⁾ Initially, the researcher explained the research objectives to the samples, then he was informed for participation in the study of informed consent. Participation in the study was voluntary and all samples were free to leave the study. All data were analysed using SPSS version 23, unpaired t-test, Chi-square and R-correlation coefficient. P-value was considered to be 0.05.

RESULTS

120 elders (74 males and 46 females) with a mean age of 67.5 ± 5.9 years participated in this study. The mean age of subjects in the LS group was 71.4 ± 7.9 and in the non-locomotive syndrome group was 67.5 ± 5.9 , which was statistically significant ($\alpha = 0.05$ and $\text{sig} = 0.009$). Most people were aged 60 - 69 (55.9%). 74.2% were married, 50% were retired, 76.7% had at least one chronic disease, 48.3% had chronic pain history and 49.2% had a history of fall Table 1. 85.8% had diploma education and higher than diploma. The frequency of chronic diseases is presented in Table 2. Pearson correlation coefficient was calculated between the GLFS-25 questionnaire and the EQ5D questionnaire and the VAS of the health level were equal to 0.86 and -0.77 respectively and were significant at the $p = 0.01$. These results indicate a significant positive association between locomotive syndrome and low quality of life in the elderly. Also, there was a significant negative association between locomotive syndrome and self-perception of health (Table 3).

In the next step, the samples were divided into two groups: locomotive syndrome and non-locomotive syndrome. The cut-off point was determined at 16. Differences between age and sex variables in two groups were calculated using T-test and Chi-square test. According to Chi-square, there was a significant correlation between gender and LS ($p = 0.05$, $\text{sig} = 0.01$). It is necessary to know that the T-statistic for the comparison of the mean of two independent samples with equal variance in comparison with the two groups with unequal variance is not the same. Therefore, we used the Levene's test and the condition for inequality of variances to test the research hypothesis. Based on the T-test, there was a significant difference. The mean score of the GLFS-25 and EQ-5D questionnaires between the two groups ($p = 0.05$, $\text{sig} = 0$). Also, T-test was used to examine the difference between the mean score of the GLFS-25 questionnaire and the VAS of health in two groups. According to the Levene's test ($\text{sig} > \alpha$), the H0 hypothesis is accepted. Considering the values ($p = 0.05$, $\text{sig} = 0$), we can say that the average level of health reported by individuals in the two groups is significantly different (Table 4).

Variable		The Number (Percentage)
Age	60 - 64	32 (26.7%)
	65 - 69	35 (29.2%)
	70 - 74	22 (18.3%)
	75 - 79	16 (3/13)
	80 years up	15 (5/12)
Marital status	Single	4 (3.3%)
	Married	89 (74.2%)
	Widow or divorced	27 (22.5%)
Chronic disease	Yes	92 (76.7%)
	No	28 (23.3%)

History of chronic pain (More than 6 months)	58 (48.3%)
There is no history of chronic pain	62 (51.7%)
There is no fall history	61 (50.8%)
The record has a fall once	38 (31.7%)
The record has fallen 2 times	14 (11.7%)
The record has 3 falls and more	7 (5.8%)

Table 1. Frequency of Variables

	Cardiovascular	Diabetes	Kidney	Musculoskeletal	Pulmonary	Brain	Mental	Cancer
Frequency	67	21	17	20	4	4	7	1

Table 2. Frequency of Chronic Diseases

Variables	Pearson Correlation Coefficient	P value N= 120
GLFS-25 questionnaire scores * EQ5D questionnaire scores	0.858	0.01
GLFS-25 questionnaire scores * VAS scores	-0.772	0.01

Table 3. Association between LS and QOL

P < 0.01

	Mean of Age	Sex		Total	df= 1 sig= 0.01 p < 0.05
		Male	Female		
LS positive	71.4±7.8	34	35	69	
LS negative	67.5±5.9	40	11	51	
Total		74	46	120	

Table 4. Chi-Square Test Result

	LS Group N= 69	Non-LS Group N= 51	T-Test for Equality of Means P= 0.05		
			T	Sig (α=0.05)	Mean Differences
GLFS-25 score	32±13.9	7.8±4.54	-11.9	0.00	-24.1
EQ5D score	4.6±1.9	1.3±1.05	-11.3	0.00	-3.3
Eq. VAS score	53.4±15.9	14.6±80.1	9.4	0.00	26.7

Table 5. Mean Scores in Two Groups (LS and Non-LS) and T-Test Result

DISCUSSION

Results of our study showed that there was a strong positive correlation between locomotive syndrome and low quality of life and people with locomotive syndrome reported lower quality of life. Quality of life and perceived health had a moderate correlation based on average scores of the questionnaire and VAS. The result of our study was confirmed by previous studies. Saeedi Mehr et al (2016) reported that among the elderly, quality of life is moderate.⁽¹⁶⁾ Zahmatkesh and colleagues (2015) reported that quality of life in Bushehr's elderly is less than 50.⁽¹⁷⁾ Ahmadi et al (2004) with the same goal in Zahedan, they reported that quality of life is weak in all dimensions of the

questionnaire.⁽¹⁸⁾ Darvishpoor (2010), Kakhki and Abed Saidi (2013) have reported that Tehranian elderly quality of life is in different dimensions of the questionnaire.^(19,20) But other studies have found other results. Ashayeri and Nejati (2008) stated that quality of life in elderly was moderate-to-high.⁽²¹⁾ Salarilak et al (2009), in evaluating the quality of the elderly in the city of Kamyaran, found that the quality of life in the elderly was at a desirable level (50 with a standard deviation of 10).⁽²²⁾

LS is a new construct in medicine. Clinical studies on this concept are few. Hirano et al, in study entitled "Impact of LS on the quality of life in the elderly concluded that there is a significant relationship between the LS and quality of life. The results of other studies suggest that LS and musculoskeletal-skeletal disorders lead to poor quality of life.⁽²³⁾ Few studies have examined the relation between quality of life and LS worldwide, but there are studies that examined the effects of musculoskeletal disorders on quality of life. To better understand the construct of LS, the dimensions of the construct should be explored and fully explained. It seems that LS is associated with degenerative musculoskeletal diseases such as spondylosis, osteoporosis and osteoarthritis. These diseases are the most common musculoskeletal disorders in the elderly, requiring special attention. Many studies have examined the relationship between quality of life and musculoskeletal disorders. Ghasemi and Chabok (2011) measured the quality of life in patients with low back and knee arthritis in Mashhad. They found that these patients had lower quality of life.⁽²⁴⁾ Nasiri and colleagues (2015) studied the relationship between musculoskeletal disorders associated with work and quality of life in nurses. They found that there was a meaningful relationship between these two variables (p= 0.05, β= 0.05). Whatever disorders increase, the quality of life is lower.⁽²⁵⁾ Tabatabaei (2017) reported that there is a significant relationship between skeletal disorders and quality of life dimensions, and these diseases are associated with a decrease in the quality of life.⁽²⁶⁾ Picavet and Hoeymans (2008) say locomotive fractures result in pain and reduced physical performance. Due to the high prevalence of these diseases and the direct impact on quality of life, they should be carefully followed and treated.⁽²⁷⁾ In a prospective study for 28 months, Ruck and colleagues found that musculoskeletal disorders have a negative impact on the various dimensions of quality of life (physical, social and psychological). They emphasised that screening disorders require timely interventions and treatments.⁽²⁸⁾ Previous studies confirm the link between quality of life and musculoskeletal disorders.⁽²⁹⁻³¹⁾ The result of this study is the same with the study in Japan. The results of Pearson correlation coefficient show that there is a significant correlation between the scores of the GLFS-25 and EQ-5D (r= 0.85, p= 0.01). EQ-5D questionnaire used to measure the quality of life in elders. Individuals in the LS group received lower scores from the quality of life questionnaire than non-LS. 87% of elders have history of one or more chronic diseases. The frequency of musculoskeletal disorders in this group was 33.3%. Considering the validity of the results of the questionnaire, its simplicity and ease of use in the elderly population, the strong relationship between LS and different dimensions of quality of life and the use of this questionnaire is highly recommended. As mentioned above, there are

studies to show the relation between LS and quality of life already.

CONCLUSION

The results of the research show that there is a direct relationship between LS and low levels of quality of life in elderly. Clearly, persons with LS have lower score from EQ-5D too. LS is a useful measure for screening people with motor disorders, so learning about this construct should be used to reduce the incidence and prevalence of LS in the community. Early diagnosis of LS leads to prevention of physical and psychological effects, increasing the quality of life, reducing the cost of treatment and reducing families and community burden. Due to the nature of the job, nurses play an important role in teaching, consulting and screening of older people at risk for development of locomotive syndrome.

Research Limit

Due to the limited access to eligible samples in study, it is recommended that study be done in a larger, randomised sample.

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