Research Paper
Comparison of the Quality of Life of COVID-19 Patients Cared for at Home and in the Hospital

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ABSTRACT

Background: The demand for home care services has increased not only due to the increase in the elderly population but also due to consumer preference and technological advances that allow for the provision of sophisticated home care. Home healthcare services aim to help people improve their performance, live a more independent life, improve their well-being, and help them stay at home, and avoid hospitalization.

Objective: This study was conducted to compare the quality of life (QoL) of COVID-19 patients under home care at a hospital in Qazvin City, Iran.

Methods: his study was a cohort study. The samples included two groups of patients, hospitalized patients due to COVID-19 and patients with COVID-19 who received medical and nursing care at home. Patients were matched for age, underlying disease, and severity of the COVID-19 disease. In this study, a 3-month follow-up on changes in QoL compared to before hospitalization and receiving care at home was performed using a QoL questionnaire (SF-12).

Findings: The mean score of QoL in the home care group was 32.36±2.15 and in the hospitalized group, it was 29.70±2.94, which shows a statistically significant difference, and the quality of home care patients reported to be higher than hospitalized patients (P<0.001, t=7.20)

Conclusion: Receiving hospital care at home increases the QoL for patients with COVID-19. This finding can be generalized during different epidemics, and home care can be an excellent alternative to hospitalization for some patients.

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1. Introduction

The 2019 coronavirus (COVID-19) pandemic ravaged the world with more than 100 million confirmed cases and more than 2 million deaths by the time vaccination began. COVID-19 In addition to physical health has also affected mental health, caused significant anxiety and depression in people and affected daily life, career, and relationships. Hence, COVID-19 has significantly affected people's quality of life [1]. Home health care (HHC) includes health care services provided to patients in their homes by qualified health care providers under the supervision of a physician. These home health care services aim to help improve all aspects of patient's quality of life (QoL), support their independence, and increase their level of wellbeing [2]. The demand for home care services has grown not only because of the increasing elderly population but also because of consumer preference and technological advances that enable the provision of complex care at home [3]. Home health care services aim to help people improve function and live more independently. Improving the optimal level of patient well-being and helping the patient stay at home avoids hospitalization or hospital admission to long-term care institutions [4]. Home care services include testing, analysis, treatment, medical care, follow-up, rehabilitation, examination, and social and psychological counseling services provided to patients at home and in the family environment [5]. The personal and social environment includes the patient's and family's condition, such as financial resources and life issues. The clinical condition consists of the diagnosis, severity, history, and disease course [6].

Hospitalization is a psychological trauma for the patient because he loses the right to determine the nature and order of his daily activities and becomes dependent on medical personnel. These often lead to depression and fear and reduce the treatment results and the quality of life of a patient suffering from a chronic disease [7]. The hospital-at-home design generally results in similar or improved clinical outcomes, shorter hospital LOS, and higher patient satisfaction than inpatient care. In particular, this plan also improves capacity limitations and increases treatment costs [8]. The COVID-19 disease pandemic has strained health systems, especially hospitals, and the need for ICU beds and ventilators has increased, while many patients with mild symptoms of covid-19 can recover at home [9]. Home care is considered one of the leading models of care to meet the medical needs of patients and vulnerable populations during the COVID-19 pandemic. home care provides high-quality and cost-effective care to individuals [10]. On the other hand, quarantine is an unpleasant experience for patients. Restriction of movement, separation from family or friends, restriction of freedom, and fear of an uncertain future are all factors that may aggravate the negative psychological impact, emotional disturbance, depression, stress, post-traumatic stress symptoms, and irritability [11]. Some discharged patients' physical and mental functions do not return to normal and are at risk of deterioration. Several studies have shown that COVID-19 can affect patients' quality of life. Physical symptoms are still observed among COVID-19 patients after hospital discharge, which may also affect their everyday life and lead to reduced quality of life [12]. WHO defines the quality of life as "an individual's understanding of their position in life in the context of the culture and value systems in which they live and according to their goals, expectations, standards, and concerns" [13].

The home care strategy adopted to reduce the pressure on the health system [14]. Hospitalized patients reported a more significant impact on mobility, self-care, and usual activities than those who were not hospitalized [15]. Initial signs and symptoms leading to hospitalization include fever, cough, shortness of breath, tachypnea, fatigue, and decreased oxygen saturation, which requires supplemental oxygen [16]. Anxiety, depression [17] is the most common problems investigated in studies and affecting the quality of life in people with COVID. Among demographic factors, gender, age, education level, occupational status, and workplace of patients were more effective than other factors involved in the quality of life [18]. Factors such as general information, from official organizations to social media platforms, repeat the increased risk of COVID-19, (2) emphasis on social distancing, (3) separation from family and friends, and (4) the need to use masks In public places(5). Economic concerns due to business closures may also influence anxiety and depression [19]. Cognitive and physical function is one of the most critical factors of quality of life and independent life in older people that COVID-19 causes decreasing this abilities [20]. Studies show that home care appears to be safe and effective in caring for non-severe COVID-19 patients and those going through the acute phase. Studying alternatives to hospitalization during the COVID-19 pandemic is of particular importance due to the relationship between the capacity of health care systems, including shortages of drugs, respiratory devices, and protective equipment [21]. Hospitals face significant challenges in providing beds, staff, and personal protective equipment. Current policy solutions aim to remove barriers for hospitals to hire additional staff or reuse or expand bed capacity. An idea that has not been widely explored is hospital-at-home programs [22]. Deciding between home cares versus hospitalization is a big challenge for doctors, especially in countries with a lack of resources compared to a high volume of

patients [23]. Home health care workers, are essential in supporting those with confirmed and suspected CO-VID-19 [24].

2. Materials and Methods

Study design

This study was conducted as a cohort study. The samples included two groups of patients, patients hospitalized due to COVID-19 and patients with COVID-19 who received medical and nursing care at home. Sample size using d's Cohen table to consider the correlation of the main variables of the study, with the average effect size (r=0.2), for a two-way test with a choice of α=0.05 (95 reliability) And β=0/2 (test power 80%) using the relation $n_0 = \frac{(z_{1-\alpha/2}+z_{1-\beta})^2}{r^2 +3}$ and taking into account the 10% probable loss of samples, the sample size was considered to be at least 180 people. Significance level less than 0.05 was considered. Patients were matched in terms of age, underlying disease, and severity of the COVID-19 disease. From both groups, moderate patients were included in the study based on CDC guideline [25]. In this study, a three-month follow-up was conducted regarding the change in the quality of life compared to before hospitalization and receiving care at home using the quality of life questionnaire (sf-12). The reliability and validity of this scale was investigated in the study of shou. et al

and Cronbach's α value (0.910) was obtained for this tool [26]. The survey of life satisfaction was done using the Life Satisfaction Index-Z scale: LSI-Z, the validity, and reliability of this scale have been investigated in the study of Tagharobi et al and Cronbach's α value (0.79) was obtained for this tool [26]. The results of the quality of life questionnaire were compared in both groups. After obtaining the necessary permits, this research was a multicenter follow-up study of COVID-19 patients who were discharged from the hospital or received care at home. This study was conducted as a cohort study that included two groups of patients hospitalized due to COVID-19 and patients with COVID-19 who received medical and nursing care at home. In this study, a three-month follow-up based on phone calls regarding the change in the quality of life compared to before hospitalization and receiving care at home will be done using a questionnaire.

3. Results

After collecting the data and entering them into the software, statistical analysis of the data using SPSS version 25 software and using descriptive statistics (various tables and graphs), and statistical tests including the chi-square homogeneity test (Chi-Square Homogeneity Test) to compare proportions in different groups, Independent Samples t-test to compare the average of small values in two independent groups (or its non-parametric

Table 1. Examining the homogeneity of the two groups in terms of demographic variables

Group / Variables		No. (%)		Chi-square Result
		Hospitalization (n=95)	Home Care (n=99)	
Sex	Female	64(67.4)	58(58.6)	P=0.171
	Male	31(32.6)	41(41.4)	
Marital status	Single	15(15.6)	21(21.2)	P=0.331
	Married	80(84.2)	78(78.8)	
Education	Illiterate	11(11.6)	9(9.1)	
	Elementary	37(39)	32(32.3)	
	High school	16(16.8)	17(17.2)	P=0.752
	Diploma	14(14.7)	18(18.2)	
	University	17(17.4)	23(23.2)	
Quantitative Variable		**Mean±SD**		**Independent t-test**
Age (y)		50.24±15.22	46.60±17.06	t=-1.48; P=0.14

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equivalent i.e. Mann-Whitney test) Mann-Whitney Test (if the hypothesis of normality is not established in any of the groups), One Way ANOVA test to compare the average of small values in two independent groups (or its non-parametric equivalent i.e. Kruskal-Wallis test (Kruskal-Wallis) if the hypothesis of normality was not established in each of the groups), covariance analysis was used to control the effect of quantitative confounding variables and randomized complete block design was used to control the effect of qualitative confounding variables. According to the obtained results, no statisti-

cally significant difference was observed in the gender, marriage, education, and age of the patients of the two groups, and the frequency and average were almost the same in the two groups (P<0.05) (Table 1).

In terms of the distribution of the frequency of stable symptoms of the disease after treatment in the two groups, according to the results obtained in terms of the amount of pain, weakness, fever, heart palpitations, digestive and taste problems in the two test and control groups, no statistically significant difference was ob-

Table 2. Examination of stable symptoms of patients

Group / Variables		No. (%)		Chi-square Result
		Hospitalization (n=95)	Home Care (n=99)	
Pain	Yes	6(6.3)	9(9.1)	P=0.469
	No	89(93.7)	90(90.9)	
Weakness	Yes	15(15.8)	22(22.3)	P=0.254
	No	80(84.2)	77(77.7)	
Tiredness	Yes	0(0)	9(9.1)	P=0.003
	No	95(100)	90(90.9)	
Dizzy	Yes	0(0)	6(6.1)	P=0.029
	No	95(100)	93(93.9)	
Heart beat	Yes	0(0)	2(2)	P=0.498
	No	95(100)	97(98)	
Shortness of breath	Yes	27(28.4)	9(9.1)	P=0.001
	No	68(71.6)	90 (90.9)	
Sleep disorder	Yes	0(0)	11(11.2)	P=0.001
	No	95(100)	88(88.8)	
Digestion	Yes	0(0)	2(2)	P=0.498
	No	95(100)	97(98)	
Fever	Yes	0(0)	2(2)	P=0.498
	No	95(100)	97(98)	
Taste	Yes	0(0)	4(4.1)	P=0.121
	No	95(100)	95(95.9)	
Smell	Yes	0(0)	7(7.1)	P=0.014
	No	95(100)	92(92.9)	

Table 3. Examining the average scores of qualities of life and life satisfaction after the intervention in two groups

Group / Variables	Mean±SD		The Result of Independent t-test
	Hospitalization (n=95)	Home Care (n=99)	
Quality of life	29.70±2.94	32.36±2.15	P<0.001, t=7.20
Life satisfaction	16.43±1.57	25.01±3.70	P<0.001, t=20.82

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served. They show almost the same frequency (P<0.05) (Table 2). In the examination of the level of fatigue, dizziness, sleep disorder, and smell, a statistically significant difference was observed in the two groups, and the condition of the patients admitted to the hospital was reported to be better than the patients cared for at home (P<0.05) (Table 2). Also, in the examination of shortness of breath, a statistically significant difference has been observed in the patients, that the condition of the patients treated at home is much better than the patients admitted to the hospital (P<0.05). (Table 2). According to the results obtained from the scores of quality and life satisfaction of patients in two groups, the average QoL score in the group cared for at home was 32.36±2.15, and in the group of patients admitted to the hospital, it was estimated to be 29.70±2.94. This shows a statistically significant difference, and the quality of patients cared for at home is reported to be higher than hospitalized patients (P<0.001, t=7.20) (Table 3). Also, the average score of life satisfaction in the group cared for at home was 25.01±3.70 and in the group cared for in the hospital, it was 16.43±1.57, which shows a statistically significant

difference and satisfaction with the life expectancy of patients cared for at home is also estimated to be higher than hospitalized patients (P<0.001, t=20.82) (Table 3).

The frequency (percentage) of the quality scores and life satisfaction of patients in two groups under home and hospital care has been investigated using the Chi-square (Fisher) test. According to the results, the QoL scores of the patients in the group under home care are reported to be at medium and reasonable levels, and in the hospital group, the most frequent scores are at poor and medium levels; the differences are statistically significant (P=0.001) (Table 4). Also, the highest frequency of life satisfaction scores of the patients in the group under home care was reported at the levels of satisfaction and high satisfaction, but in the group of patients admitted to the hospital, the highest frequency was related to the levels of dissatisfied and slightly dissatisfied, and these differences are statistically significant (P<0.001) (Table 4).

Table 4. Examining the frequency of quality of life (QOL) scores and life satisfaction after the intervention in two groups

Group / Variables		No. (%)		Chi-square Result
		Hospitalization (n=95)	Home Care (n=99)	
Quality of life	Weak	8(8.4)	0(0)	P=0.001 Fisher-exact=11.52
	Medium	87(19.6)	96(97)	
	Good	0(0)	3(3)	
Life satisfaction	Unhappy	10(10.6)	0(0)	P<0.001 Fisher-exact=183.95
	A little unhappy	81(85.2)	10(10)	
	Neutral	4(4.2)	2(2)	
	A little satisfied	0(0)	38(38)	
	Satisfied	0(0)	43(43)	
	Extremely satisfied	0(0)	6(6)	

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4. Discussion

The results of the present study showed that care at home compared to receiving care at the hospital in COVID-19 patients leads to an increase in the quality of life and an increase in the patients' life satisfaction.

COVID-19 has caused significant psychological and physiological stress for patients and their families worldwide [27]. The communication of hospitalized COVID-19 patients with society decreases. Meanwhile, they focus more on themselves and less on the people around them and social affairs, which leads to a lower SF score. Recent studies reported that in the early stages of the outbreak of COVID-19, patients were at higher risk for mental health problems compared to the general population [28]. Most of the studies conducted have examined the QoL of patients with the COVID-19 outbreak after discharge from the hospital, and the researchers of this study, like the present study, compared the QoL of patients under hospital and home care after recovery. A review study conducted by Nandasena et al. reported that the QoL score was low in hospitalized and discharged COVID-19 patients [29]. The present study also observed that the QoL scores of patients admitted to the hospital were lower than those cared for and treated at home. In another study conducted by Poudel et al., a low QoL score was reported in hospitalized COVID-19 patients compared to the general population [30]. COVID-19 patients are quarantined for 10 to 14 days with zero social interaction, so the prevalence of loneliness is high among people experiencing symptoms related to COVID-19 [31]. However, this feeling of loneliness and depression is decreased in patients who receive standard treatment at home. Al-Surimi et al.'s study showed that home care improves patients' QoL [32]; our study investigated the QoL in COVID-19 patients compared to other diseases due to public concerns and long-term separation. Family patients have a higher risk factor for reducing satisfaction and QoL, and providing standard care at home to this group of patients increases satisfaction and QoL. Investigating the QoL of patients receiving medical care at home has been reported in many studies, including the study of Flanagan et al., in which, in a review study, they found that the QoL of patients with different medical diagnoses who received treatment at home was relatively high. Furthermore, it has improved [33], but the authors did not find a study on QoL of patients with COVID-19 who received treatment at home. A systematic review and meta-analysis conducted by Arsenault et al. showed that patients with chronic diseases who presented to the emergency department and were treated with home-based interventions had a lower risk

than those who received in-hospital care. The hospitalization and long-term hospitalizations are less. However, the two groups had no difference in mortality, but the results of the previous study showed that the length of treatment in the group cared for at home was longer than in the hospital group. It has also been shown that home care may be associated with better anxiety and depression scores [34]. In times of epidemics and a lack of hospital beds, providing care at home may be a viable option. On the other hand, mental and emotional damage caused by hospitalization, especially for the elderly, is accompanied by increased concerns due to the epidemic. It is not a secret; as stated in the study by Perikas et al., "Hospital home units appear to be safe and effective for providing care to patients with COVID-19, and therefore could be used to reduce the healthcare burden in hospitals" [35].

5. Conclusion

Receiving hospital care at home increases the QoL for patients with COVID-19. This finding can be generalized during different epidemics, and home care can be a suitable alternative to hospital admission for some patients.

Ethical Considerations

Compliance with ethical guidelines

After receiving the code of ethics from the Ethics Committee under the No. IR.QUMS.REC.1400.431, this study started to collect information. Also, the authors are committed to the confidentiality of information.

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Authors' contributions

Conceptualization and methodology: Sareh Mohammadi and Leili Yekefallah; Validation, analysis, and resource investigation: Leili Yekefallah, Abbas Ahmadi, and Rohollah Kalhor; Data gathering, writing–original draft preparation: Sareh Mohammadi, Abbas Ahmadi, and Soheil Soltani; Writing–review, and editing: Leili Yekefallah, Sareh Mohammadi, and Peyman Namdar; Project administration: Sareh Mohammadi, and Leili Yekefallah.

Conflict of interest

The authors declared no conflict of interest.

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