

# Examining Lifestyle Components in Hospitalized COVID-19 Patients, Iran 2021

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**Background:** COVID-19 pandemic is a serious health threatening element throughout the world. One of the key elements to strengthen the body's immune system is to follow a healthy lifestyle to deal with health threatening. The aim of this study was to evaluate the lifestyle components in COVID-19 patients.

**Methods:** This descriptive-analytical study carried on hospitalized COVID-19 patients from October 22, 2020 to January 19, 2021. Demographic characteristics, physical activity, nutritional status, stress and anxiety, and substance abuse were assessed. A simple model and multiple logistic regression model were used.

**Results:** About 32% were hospitalized in the intensive care unit (ICU). Healthy lifestyle was observed only in 28%. About 82% had insufficient physical activity, and 67.3% was reported to be unfavorable in nutritional status. Severe stress and anxiety were observed in 30.4% of people. There were significant relationships between age (AOR = 2.11,  $p = 0.036$ ), education (AOR = 0.35,  $p = 0.002$ ) and a healthy lifestyle. A significant correlation was observed between ICU admission and unhealthy lifestyle (AOR = 0.40,  $p = 0.015$ ).

**Conclusion:** Unhealthy lifestyle behaviors were seen in the most COVID-19 patients. Considering the significance of lifestyle changes could prove effective in reducing the risk of transmissible viral infections.

**Key Words:** Nutritional status, Physical activity, COVID-19, Lifestyle components

## INTRODUCTION

The living environment will never be fully void of pathogens. Currently, COVID-19 pandemic is a serious health threatening

element for people throughout the world. This is while so far, no definitive treatment has been found for it, and the critical advice that is emphasized by the experts is to prevent the disease [1,2]. One of the best approaches to prevent and deal with health threatening factors is to strengthen the immune system that has two parts: innate and acquired immunity. The acquired immune system is a defense mechanism that comes into existence during life and acts by producing antibodies to eliminate invasive agents [3,4]. One of the key elements to maintain and enhance the body's defense mechanism is to follow a healthy lifestyle - using a healthy diet, doing regular exercises, maintaining a healthy weight, not the consumption of alcohol and smoking, getting

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enough sleep and controlling stress [5]. Overall, healthy lifestyle behaviors are related to increased life expectancy and health and decreased mortality associated with all causes [6]. Possible changes in a person's lifestyle during the COVID-19 pandemic and behaviors like the changes in eating habits, insufficient physical activity, health concerns, social isolation, and reduced sleep quality that are all in interaction with are seriously associated with poor health outcomes [5,7]. As no studies have examined all the components of patients' lifestyles during the COVID-19 pandemic in Iran, we sought to carry out a study entitled "Examining lifestyle components in hospitalized COVID-19 patients."

## MATERIALS AND METHODS

The study was descriptive-analytical. The population included all individuals with various degrees of COVID-19 disease hospitalized in general wards and intensive care unit (ICU) of Golestan Hospital, Kermanshah for three months from October 22, 2020 to January 19, 2021. Sampling was done using the convenient sampling method. We visited various wards of the hospital after obtaining the necessary permits from the Vice Chancellor for Research and Technology of the university. The inclusion criteria were suffering from COVID-19 disease based on PCR test results, clinical signs and computed tomography (CT) scan. Exclusion criteria were unwillingness to cooperate and the death of the patient. First of all, the objectives of the study were explained to the participants and their written consents were obtained. Then the questionnaire was given to the samples and filled out. The data was then entered into SPSS16 and statistically analyzed. Data collection tools had four parts. The first part was demographic information: it had six questions about patients' personal information examining age, gender, marital status, level of education and place of residence. The second part had to do with the physical activity performance: International Physical Activity Questionnaire-Short Form (IPAQ-SF) was used. This questionnaire categorizes the last 7 days of physical activity into three categories: weak, moderate and severe. The intensity of activities in the last 7 days is determined based on the final score. The intensity of physical activity was in the weak category if the total energy calculated during the week was less than 600 Metabolic

equivalent of task/calorie/week (Mets/Cal/W), in the medium category if it was between 600 and 3000 Mets/Cal/W, and in the severe category if more than 3000 Mets/Cal/W [8]. The third part included the Nutritional Status Questionnaire with 9 questions taken from the sub-components of the Standard Health-Promoting Lifestyle Profile Questionnaire [9] and Dass Stress and Anxiety Scale with 14 questions. The Likert scale was used to answer this part of the questionnaire [10]. The fourth part was the screening questionnaire and determining the severity of substance abuse with 11 questions [11].

The data was statistically analyzed using descriptive and analytical statistics in SPSS 16. Many indices were used in the descriptive statistics part. A simple model and multiple logistic regression model were used in the analytical statistics section to specify the relationship between age, gender, education, income, body mass index (BMI), hospitalization ward, history of substance use and history of chronic diseases. Significance levels were reported for odds ratio  $< 0.05$  and related confidence interval (CI) of 0.95%.

## RESULTS

Among the participants, 51.2% ( $n = 111$ ) were over 30 years old and the rest were under 30 years old. In gender, 66.4% (144) were males and the rest were females. About 57% were married and 49.8% ( $n = 107$ ) earning less than \$ 100 per month. Examining BMI revealed that 40.3% ( $n = 87$ ) were overweight and 8.8% ( $n = 19$ ) were obese. About 68% ( $n = 147$ ) were hospitalized in the general ward and 32% ( $n = 69$ ) in the intensive care unit (ICU). A history of drug use was reported in 22.1% ( $n = 48$ ). In terms of lifestyle patterns, individuals were divided into two groups with healthy and unhealthy lifestyles. About 28% ( $n = 60$ ) had a healthy lifestyle and 72% ( $n = 157$ ) were unhealthy. In examining lifestyle components, 81.6% ( $n = 177$ ) had insufficient physical activity and 18.4% ( $n = 40$ ) more than average. In nutritional status, 32.7% ( $n = 71$ ) was reported to be favorable and the rest unfavorable. Severe stress and anxiety were observed in 30.4% of people ( $n = 66$ ). The sleep hours in 48.8% ( $n = 105$ ) was less than 6 hours per day (Table 1).

There were statistically significant relationships between age and a healthy lifestyle (AOR = 2.11,  $p = 0.036$ ), people

**Table 1.** Lifestyle status and characteristics of study participants (N = 217)

Variable	Level	Total (N = 217)	Healthy lifestyle, n (%)	
			No (n = 157, 72.4%)	Yes (n = 60, 27.6%)
Age	< 30	106 (48.8)	70 (66.0)	36 (34.0)
	> 30	111 (51.2)	87 (78.4)	24 (21.6)
Sex	Female	73 (33.6)	53 (72.6)	20 (27.4)
	Male	144 (66.4)	104 (72.2)	40 (27.8)
Marital statuses	Single	93 (42.9)	67 (72.0)	26 (28.0)
	Married	124 (57.1)	90 (72.6)	34 (27.4)
Education	Under diploma	124 (57.1)	101 (81.5)	23 (18.5)
	More	93 (42.9)	56 (60.2)	37 (39.8)
Job	Freelance	74 (34.1)	52 (70.3)	22 (29.7)
	Employee	79 (36.4)	58 (73.4)	21 (26.6)
	Unemployed	64 (29.5)	47 (73.4)	17 (26.6)
Income	Less than 2 mill	107 (49.8)	84 (78.5)	23 (21.5)
	More than 2 mill	108 (50.2)	71 (65.7)	37 (34.3)
BMI	Normal	110 (50.9)	77 (70.0)	33 (30.0)
	Overweight	87 (40.3)	67 (77.0)	20 (23.0)
	Obese	19 (8.8)	12 (63.2)	7 (36.8)
ICU admission	Yes	69 (31.9)	42 (60.9)	27 (39.1)
	No	147 (68.1)	114 (77.6)	33 (22.4)
Drug abuse history	Yes	48 (22.1)	38 (79.2)	10 (20.8)
	No	168 (77.8)	118 (70.2)	50 (29.8)
Type of drug used	Cigarette	15 (30.6)	13 (86.7)	2 (13.3)
	Hookah	24 (49.0)	16 (66.7)	8 (33.3)
	Other	34 (60.4)	34 (100.0)	0 (0.00)
Age of onset of smoking	< 20	35 (74.5)	26 (74.3)	9 (25.7)
	> 20	12 (74.5)	11 (91.7)	1 (8.3)
Chronic disease history	Yes	12 (25.5)	10 (83.3)	2 (16.7)
	No	35 (74.5)	27 (77.1)	8 (22.9)
Physical activity	< 600	177 (81.6)	141 (79.7)	36 (20.3)
	> 600	40 (18.4)	16 (40.0)	24 (60.0)
Drug abuse	> 25	5 (2.3)	5 (100.0)	0 (00.0)
	< 25	212 (97.7)	152 (71.7)	60 (28.3)
Stress and anxiety	18-25	66 (30.4)	57 (86.4)	9 (13.6)
	13-18	75 (34.6)	50 (66.7)	25 (33.3)
	10-13	76 (35.0)	50 (65.8)	26 (34.2)
Optimal nutritional status	No	71 (32.7)	68 (95.8)	3 (4.2)
	Yes	146 (67.3)	89 (61.0)	57 (39.0)
Sleep hours	< 6	105 (48.8)	101 (96.2)	4 (3.8)
	6-8	88 (40.9)	42 (47.7)	46 (52.3)
	> 8	22 (10.2)	12 (54.5)	10 (45.5)

BMI: Body mass index, ICU: intensive care unit.

over 30 had a healthier lifestyle by controlling the confounding and significant variables in the multiple-model. There was a significant relationship between education and a healthy lifestyle (AOR = 0.35,  $p = 0.002$ ). There was a statistically significant relationship between the ICU admission and unhealthy lifestyle (AOR = 0.40,  $p = 0.015$ ) (Table 2).

## DISCUSSION

This descriptive-analytical study was performed to examine the lifestyle components in COVID-19 patients. Among the participants, 51.2% were over 30 years old and the rest were under 30 years old. Examining BMI revealed that 40.3% were overweight and 8.8% were obese. About 68%

**Table 2.** Bivariate and multivariate logistic regression of factors associated with lifestyle

Variable	Level variable	Non adjusted		Adjusted	
		OR (95% CI)	p	AOR (95% CI)	p
Age	< 30		0.044	1 (Baseline)	0.036
	> 30	0.53 (0.29, 0.98)		2.11 (1.05,4.24)	
Sex	Female	1 (Baseline)	0.953	1 (Baseline)	0.799
	Male	1.02 (0.54,1.92)		1.12 (0.477,2.62)	
Marital statuses	Single	1 (Baseline)	0.930	-	-
	Married	0.97 (0.53,1.77)		-	-
Education	Under diploma	1 (Baseline)	0.001	1 (Baseline)	0.002
	More	2.90 (1.57,5.36)		0.35 (0.18,0.67)	
Job	Freelance	1 (Baseline)		-	-
	Employee	0.86 (0.42,1.73)	0.665	-	-
	Unemployed	0.85 (0.41,1.80)	0.680	-	-
Income	Less than 2 mill	1 (Baseline)	0.038	1 (Baseline)	0.153
	More than 2 mill	1.90 (1.03,3.49)		1.71 (0.82,3.59)	
BMI	Normal	1 (Baseline)		1 (Baseline)	
	Overweight	0.67 (0.37, 1.32)	0.272	0.66 (0.22,2.05)	0.478
	Obese	1.36 (0.49,3.76)	0.553	0.42 (0.13,1.32)	0.137
ICU admission	Yes	1 (Baseline)	0.012*	1 (Baseline)	0.015*
	No	0.45 (0.24, 0.84)		0.40 (0.19,0.84)	
Drug abuse history	Yes	1 (Baseline)	0.226	-	-
	No	1.61 (0.74,3.48)		-	-
Age of onset of smoking	< 20	1 (Baseline)	0.230	-	-
	> 20	0.26 (0.03,2.33)		-	-
Chronic disease history	Yes	1 (Baseline)	0.653	-	-
	No	1.48 (0.27,8.20)		-	-

BMI: Body mass index, ICU: intensive care unit.

\*p-value < 0.05 was considered as significant.

were hospitalized in the general ward and 32% in the intensive care unit (ICU). A history of drug use was reported in 22.1%. In terms of lifestyle patterns, individuals were divided into two groups with healthy and unhealthy lifestyles. About 28% had a healthy lifestyle and 72% were unhealthy. In examining lifestyle components, 81.6% had insufficient physical activity and 18.4% more than average. In nutritional status, 32.7% was reported to be favorable and the rest unfavorable. Severe stress and anxiety were observed in 30.4% of people. The sleep hours in 48.8% was less than 6 hours per day.

There were statistically significant relationships between age and a healthy lifestyle, people over 30 had a healthier lifestyle by controlling the confounding and significant variables in the multiple-model. There was a significant relationship between education and healthy lifestyle, which means that adherence to a healthy lifestyle was more in people with higher education levels. There was a statistically

significant relationship between the ICU admission and unhealthy lifestyle (AOR = 0.40, p = 0.015).

About 28% of people had a healthy lifestyle and 72% had an unhealthy lifestyle. Giuntella et al. [12], studying the lifestyle of adults before and during the COVID-19 pandemic, reported significant disturbances in physical activity, sleep patterns, and depression in the subjects with the onset and throughout the COVID-19 pandemic compared to before this period. In Müller et al. [13], the level of inactivity increased by 30% during the COVID-19 epidemic. In line with this, Curtis et al. [14], examining the changes in lifestyle components (activity pattern, diet, and weight) before and during the COVID-19 pandemic in Australia - argued that individuals' physical activity decreased during the pandemic, protein intake decreased, and alcohol consumption increased. On the contrary, Di Renzo et al. [15], studying lifestyle changes and eating habits during the COVID-19 pandemic in Italy indicated that attention and adherence to

a healthy lifestyle pattern in individuals increased significantly with the prevalence of COVID-19. Thus, more attention was paid to the complications associated with overweight and obesity in 48.6% of people and 3.3% of smokers decided to quit smoking. Also, increased physical activity, especially weight loss activities were reported in 38.3% of people. The tendency towards a more Mediterranean diet and buying organic products increased significantly. According to the results of studies, exercising keeps the immune cells active by increasing the body's blood circulation [16,17]. In contrast, an unhealthy diet and a lack of certain nutrients may weaken and suppress immune responses. Sleep deprivation and lack of stress control are connected with reduced immune response and fighting diseases [15,18,19].

There was a significant relationship between unhealthy lifestyle variables and hospitalization ward (ICU admission). Hamer et al. [20], reported unhealthy lifestyle behaviors in 51% of people with severe COVID-19, and unhealthy lifestyle habits were related to an increased risk of hospitalization. Morgan et al. [21], studying obesity as a risk factor for hospitalization and death from influenza A (H1N1) in 2009, showed that obesity in people over 20 years of age increased their chances of hospitalization and mortality due to H1N1 infection. Although the relationship between lifestyle factors and risk of hospitalization for COVID-19 is unknown, developing mild inflammation because of this disease appears to be a key mechanism. More studies in this regard are required for better interpretation of these results.

This study had some limitations like cross-sectional design and lack of determining the cause-and-effect relationship and relatively small sample size. The strengths of this study, is the examining the lifestyle components of COVID-19 patients that have not been examined enough in Iran.

## CONCLUSION

According to the findings, unhealthy lifestyle behaviors including poor nutritional status and insufficient physical activity were seen in most COVID-19 patients. Lack of sleep and severe stress and anxiety existed in many people too. Considering the significance of lifestyle changes on current and future epidemics, as well as the emphasis on lifestyle

guidelines on the role of healthy eating and regular physical activity in managing the prevalence of COVID-19, planning and taking interdisciplinary measures for making simple lifestyle changes could prove effective in reducing the risk of transmissible viral infections and its complications.

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