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SOCIAL AND MEDICAL RISK FACTORS OF COVID-19 DISEASE

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ABSTRACT

This study was conducted based on a retrospective study of the medical histories of patients who were hospitalized with a diagnosis of COVID-19 in the Bukhara Regional Multidisciplinary Hospital and the Bukhara Regional Infectious Diseases Hospital in 2020-2022. Like all infectious diseases, COVID-19 has its own social characteristics. That is, in this case, the age of patients, their region of residence, social strata of the population, and gender characteristics can have a different impact on the spread of the disease. The social characteristics of the population directly cause changes in the occurrence of medical risk factors in one way or another during the spread of the disease. In turn, the development of medical risk factors also sharply reduces the effectiveness of treatment for the disease. Therefore, the social and medical factors mentioned above are being studied extensively worldwide. This article discusses the likelihood of developing medical risk factors, analyzing each of the social factors listed above separately.

INTRODUCTION

In late December 2019, a cluster of idiopathic pneumonias was identified in hospitals in Wuhan, China, and began to spread rapidly [1]. During the study, researchers identified the disease as a new coronavirus infection called severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), and the disease it causes was later named COVID-19[2]. Since then, various aspects related to the spread of the disease have been analyzed. Among them, the most studied aspect is the age of the patients, and the patients have been analyzed by dividing them into several age categories. According to this, although the incidence of COVID-19 in young children is higher than in adults, the incidence of complications and deaths from the disease is very low [3]. In contrast, older people over 60 years of age are more susceptible to infection, with many of them being admitted to intensive care units, and the morbidity and mortality rates among this age group are very high [4]. On the other hand, it is necessary to clarify data on population density when modeling the spread of diseases in a territorial context. That is, in addition to assessing the impact of population density on COVID-19 infection in studies, it is important to establish the ratio of the role of population density in the overall impact of infection to the total number of infected populations. Accordingly, it is assumed that areas with a large population, mainly in cities, may have more cases of infection due to higher human density [5]. From another perspective, in some developed countries of the world, an opposite trend has been observed in the spread of COVID-19 between urban and rural populations. Accordingly, due to the high level of compliance with quarantine rules among urban residents and the targeted level of medical care, the incidence and mortality in these areas are relatively low compared to rural residents, while due to the relatively weak level of medical care among rural residents and the incomplete level of compliance with quarantine rules, more incidence and mortality have been observed in these areas compared to urban residents [6.7.]. Another social characteristic of the population that has played an important role in the spread of COVID-19 and has caused much discussion is the gender characteristics of patients, as the spread of COVID-19 has been manifested in different waves around the world. According to a study conducted by Chinese scientists Huang et al., the incidence of the disease in men was higher than in women (51%) [8]. In this study, the majority of patients were between 30 and 79 years of age [9], and the condition was more severe in older people with comorbidities [10]. Turning to data sources from other countries, women make up 70 percent of health workers in most countries and are actively involved in primary health care systems around the world [11,12]. Therefore, female healthcare workers are at high risk due to their frequent contact with infected patients. According to the latest data, 72% and 66% of healthcare workers diagnosed with COVID-19 in Italy and Spain, respectively, were women [13]. Among medical risk factors, diabetes was ranked as the most common metabolic disease that weakens the immune system in the world.[14]. The number of people with diabetes is increasing, especially in developed countries. Researchers have shown that diabetes increases the risk of complications from

COVID-19 [15, 16].Treatment efficacy in patients with diabetes is relatively low and often associated with comorbid conditions, leading to a high risk of death [15]. Another common disease is arterial hypertension, which is often hereditary and is aggravated by an unhealthy lifestyle. When researchers analyzed the mortality rate from COVID-19, they found that arterial hypertension was one of the main causes. This is most likely due to the damage to the renin-angiotensin-aldosterone system as a result of the entry of the SARSCoV-2 virus into the AAF2 receptors. That is, according to this mechanism, dysfunction begins in organs where AAF2 receptors are located, including the lungs [17]. In addition, other diseases of the respiratory system, connective tissue diseases, blood system and oncological diseases are considered high medical risks when they occur together with COVID-19. During the social and medical analyses conducted to date on the spread of COVID-19, various conclusions have been reached internationally and the ongoing debates are still ongoing.

Purpose of the work

Statistical and analytical analysis of social factors influencing the spread of COVID-19 in the Bukhara region.

Materials and methods

The scientific research was conducted through statistical and analytical analysis of the medical history of 2,002 patients who were hospitalized with a diagnosis of COVID-19 in 2020-2022 at the Bukhara Regional Hospital and the Bukhara Regional Infectious Diseases Hospital.

Results

Based on the study of available data on patients involved in the study, attention was paid to age indicators. Because the severity of the disease, along with the course of the main and concomitant diseases and the development of complications, is directly related to the age factor.

The distribution of patients by age in the study is shown in Table 1.

Table 1

№	Age range	Number of infected patients	Average age of infected	Proportion of infected patients
1	0-20	237	8	12%
2	21-30	265	26	13%
3	31-40	383	36	19%
4	41-50	328	46	16%
5	51-60	366	56	18%
6	61-70	306	65	15%
7	71-80	95	75	5%
8	81-90	20	85	1%

As can be seen from the table, patients who have recovered from COVID-19 are divided into eight age categories. Accordingly, patients under 20 years old account for 12% of all hospitalized patients. The average age of this group is 8 years old. Patients aged 21 to 30 years old account for 13% of all studied patients, and their average age is 26 years old. Patients aged 31 to 40 years old account for 19% of all patients, and their average age is 36 years old. Patients aged 41 to 50 years old account for 16% of all patients, and their average age is 46 years old. Patients aged 51 to 60 years old account for 18% of all patients, and their average age is 56 years old. Patients aged 61 to 70 years accounted for 15% of the total patients, with a median age of 65 years. Patients aged 71 to 80 years accounted for 5% of the total patients, with a median age of 75 years. Finally, patients aged 81 to 90 years accounted for approximately 1% of the total patients, with a median age of 85 years. It is clear from this that patient aged 20 to 55-60 years accounted for a very large proportion of the total number of patients, and the incidence of complications among them was very high.

Taking this into account, the population can be conditionally divided into 2 strata based on their social characteristics. Here, it is worth highlighting the socially active population and the population with low social activity.

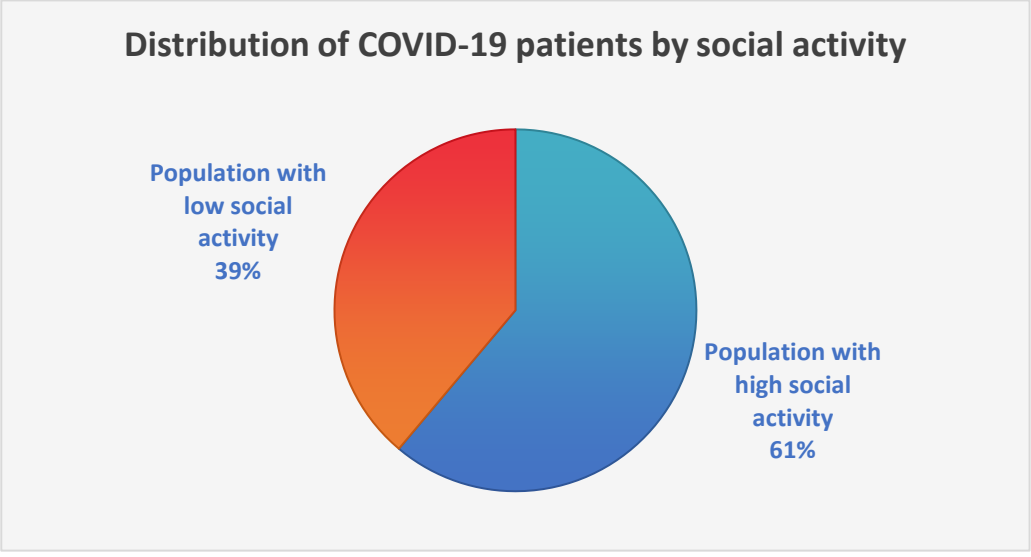

Figure 1

Based on the diagram above, it can be said that the incidence of COVID-19 is significantly higher in the socially active population. That is, in terms of percentage, these indicators are 61% for the socially active population, and 39% for the socially inactive population. It is important to note that the socially active population includes men aged 20 to 60 and women aged 20 to 55, while the socially inactive population includes men and women aged under 20, men over 60, and women over 55.

The clinical course of COVID-19 is directly related to the gender characteristics of patients. Accordingly, the classification of patients with COVID-19 according to gender differences is very important. In this regard, it is necessary to analyze specific data on the spread of COVID-19 in men and women.

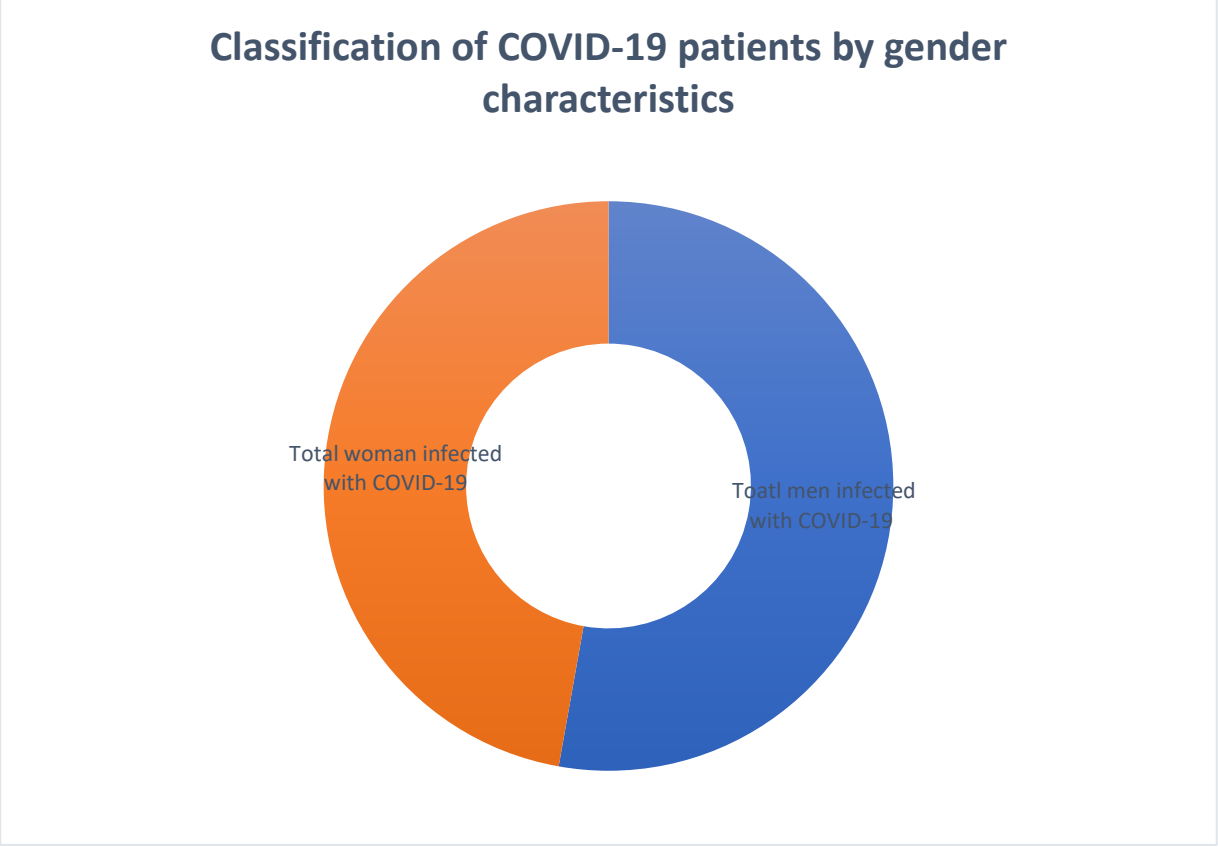

Figure 2

This diagram shows that the incidence of COVID-19 among men is slightly higher than among women. In turn, if we take it as a percentage, the percentage of men infected with COVID-19 is 52.8%, while for women it is 47.2%. This shows that there are specific differences in the spread of COVID-19 between men and women. Therefore, it is important to study the specifics between men and women when studying the spread of the disease. Therefore, we decided to study the spread of COVID-19 between men and women depending on the level of social activity.

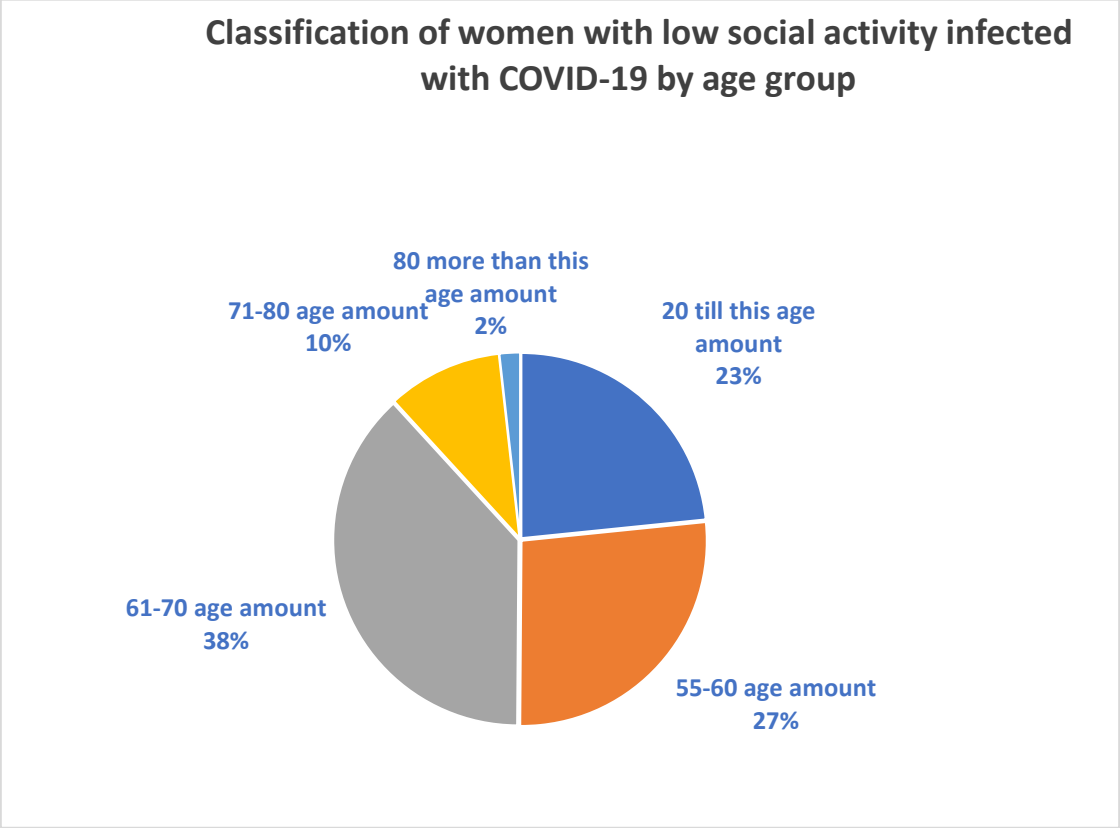

Figure 3

If we classify the group of women with low social activity by age group, women under 20 years old who have contracted COVID-19 accounted for 23% of the total. Women aged 55-60 years old who have contracted COVID-19 accounted for 27%. The highest figure was for women aged 61-70 years old who have contracted COVID-19, accounting for 38%. Women aged 71-80 years old who have contracted COVID-19 accounted for 10% of the total. The total share of women over 90 years old who have contracted COVID-19 is approximately 2%.

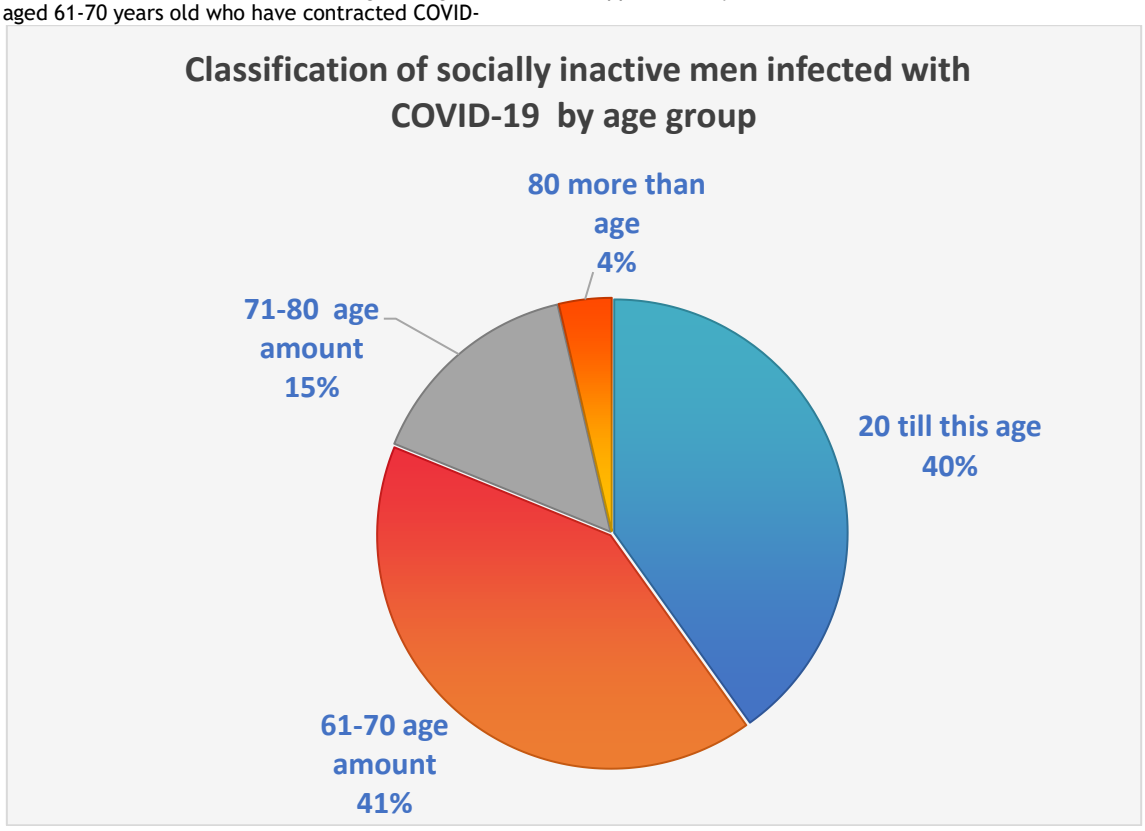

Figure 4

In turn, if we classify men infected with COVID-19 with low social activity by age group based on the diagram above, the total proportion of men infected with COVID-19 under the age of 20 was 40%. The highest figure was for men infected with COVID-19 aged 61-70, which was 41%. Men infected with COVID-19 aged 71-80 were 15%. Men infected with COVID-19 over 80 were approximately 4%.

COVID-19 infection was observed at a significantly higher frequency in the population with high social activity.

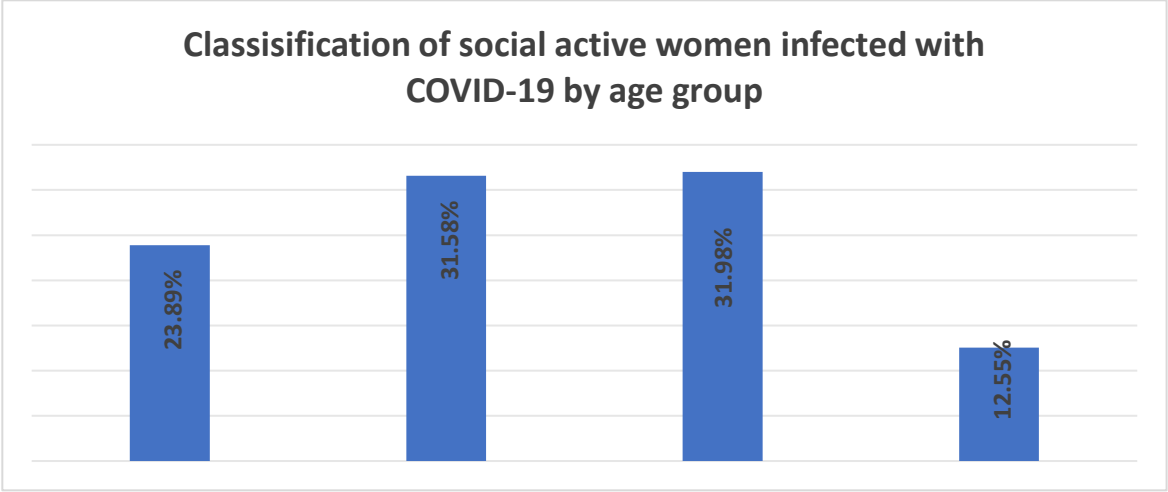

Figure 5

The percentage of socially active women aged 21-30 infected with COVID-19 was approximately 24%. Women infected with COVID-19 aged 31-40 were on average 31.5%. Women infected with COVID-19 aged 41-50 were approximately 32%. The lowest figure was for the group of patients aged 51-60 and was 12.5%.

These results show that among the socially active women, the incidence of the disease is very high in the age groups 31-40 and 41-50. On the contrary, the incidence of the disease is significantly lower in the group of patients aged 51-60. Among women, the higher incidence of the disease in patients aged 31-40 and 41-50 is explained by the fact that women in this age group generally constitute the main workforce.

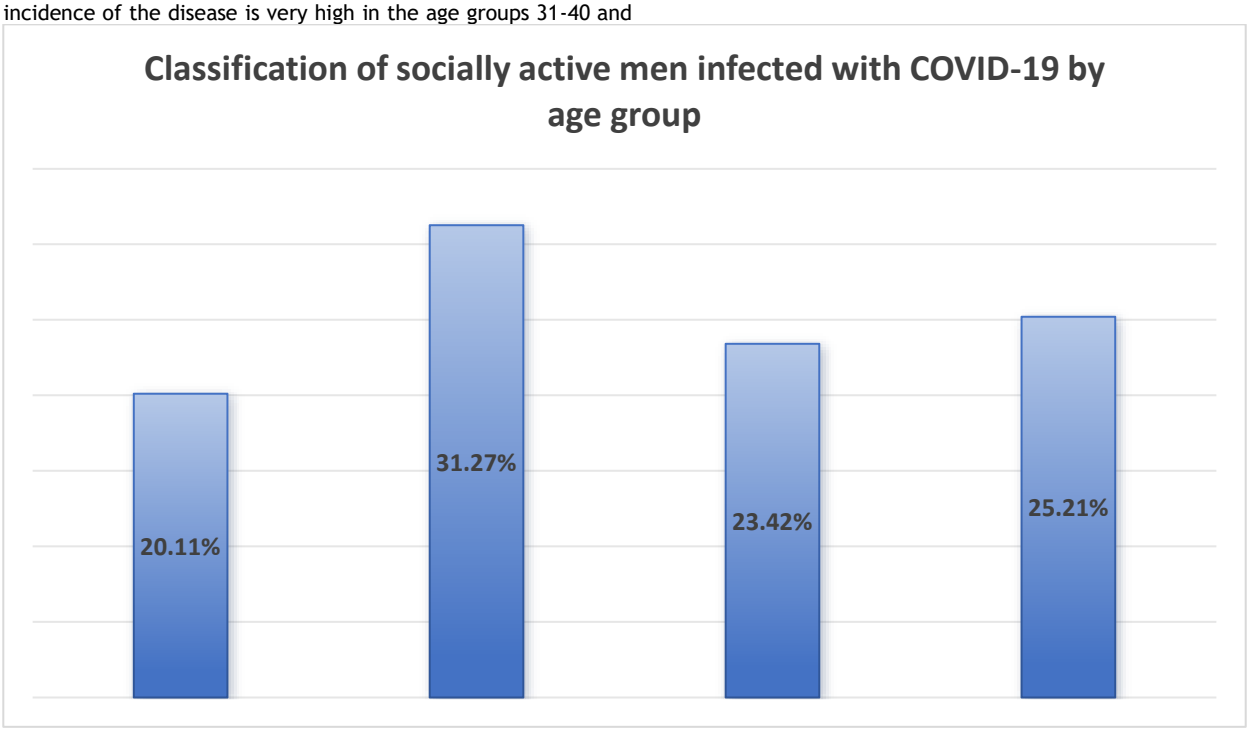

Figure 6

Based on the results in the figure, the incidence of COVID-19 in the group of men aged 21-30 was 20%. In turn, the total proportion of patients infected with COVID-19 in the group of 31-40 years was 31% on average. While the incidence of COVID-19 in men aged 41-50 years was 23% on average, this figure is 25% for the group of patients aged 51-60 years. As can be seen from the above, the incidence of men aged 31-40 years, although slightly higher than in other age groups, is almost similar to other age groups. Unlike women, the incidence of men infected with COVID-19 was almost the same in all age groups. It can be seen that the incidence of men infected with COVID-19 was slightly higher only in the age group of men aged 31-40 years. This situation is also explained by the slightly higher proportion of men in this age group in the upper communication work class.

When analyzing the spread of COVID-19, it is very important to systematize data on the place of residence of patients. In this regard, analyzing COVID-19 patients by place of residence in urban

and rural areas will allow us to study the spread of this disease in more depth.

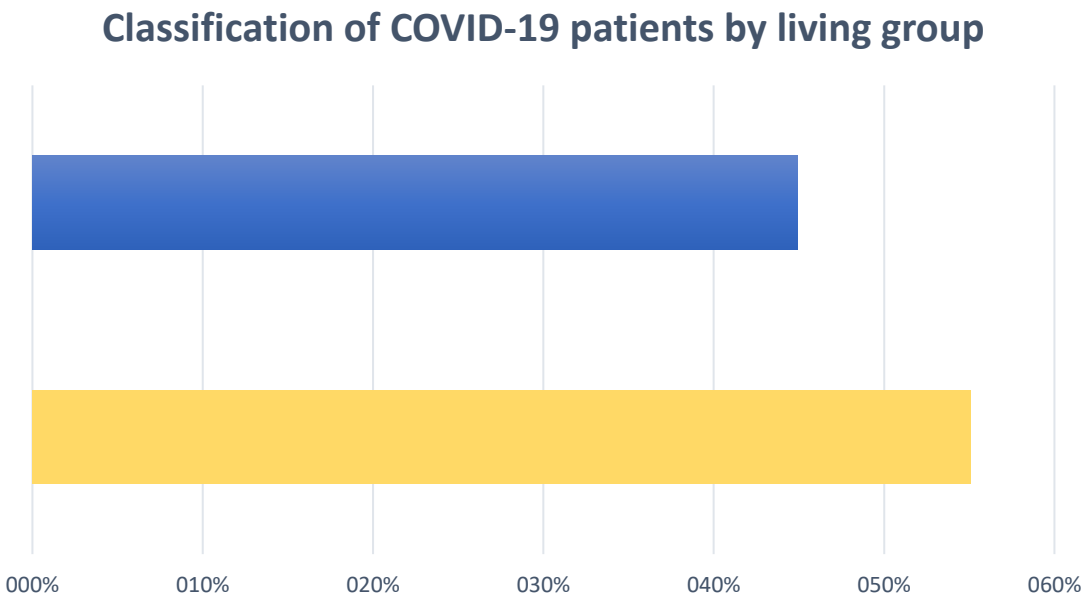

Figure 7

The data presented in this figure show that the incidence of COVID-19 is slightly higher in urban areas than in rural areas. This is mainly explained by the higher population density among urban areas.

In turn, analyzing the incidence of COVID-19 between urban and rural areas by gender of treated patients allows us to understand specific differences in the spread of the disease.

Table 2

Adress	Male patients	Percentage	Female patients	Percentage
City	592	56,11%	553	58,52%
Rural area	463	43,89%	392	41,48%

Based on the above table, if we analyze the male and female patients infected with COVID-19 according to their belonging to the urban and rural population, we can see that 58.5% of the total women infected with COVID-19 belong to the urban population, while 56.1% of the total men infected with COVID-19 belong to the urban population. When the rural population is monitored, it can be seen that 41.5% of the total women infected with COVID-19 and 43.9% of the infected men belong to this stratum. From the above analysis, it can be said that, in general, we can observe almost equality between the prevalence of the disease between women and men, whether they belong to the urban or rural population.

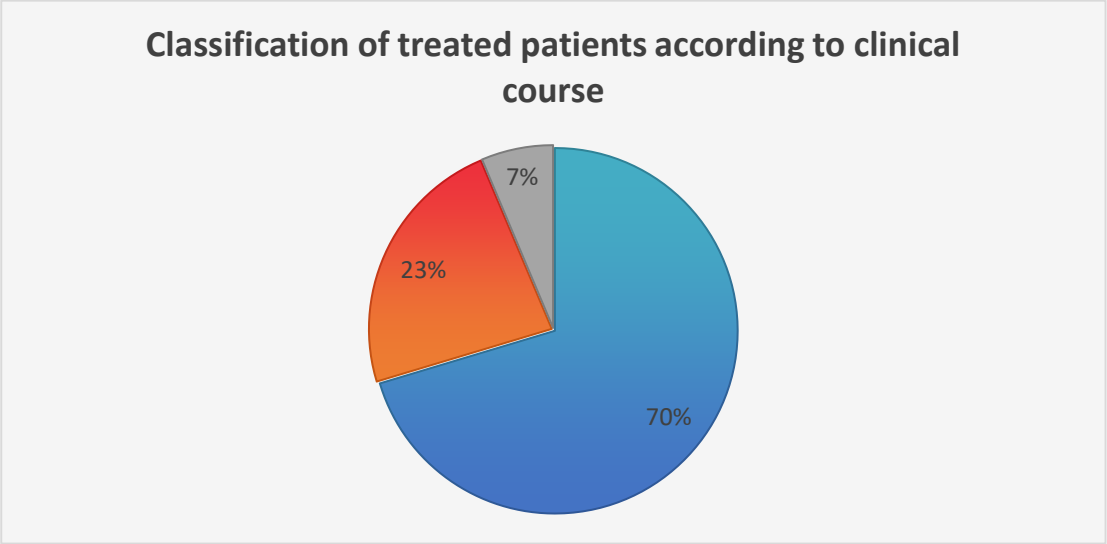

Figure 8

When analyzing the severity of COVID-19 in 2020-2022, 70% of hospitalized patients were hospitalized in severe condition. 23% of all patients were hospitalized in moderate severity. Only 7% of cases were hospitalized with mild COVID-19. This ratio is largely due to the different attitudes towards the course of the disease over the years.

In turn, when examining the statistics of hospitalization of hospitalized patients over the years, the following situation can be observed.

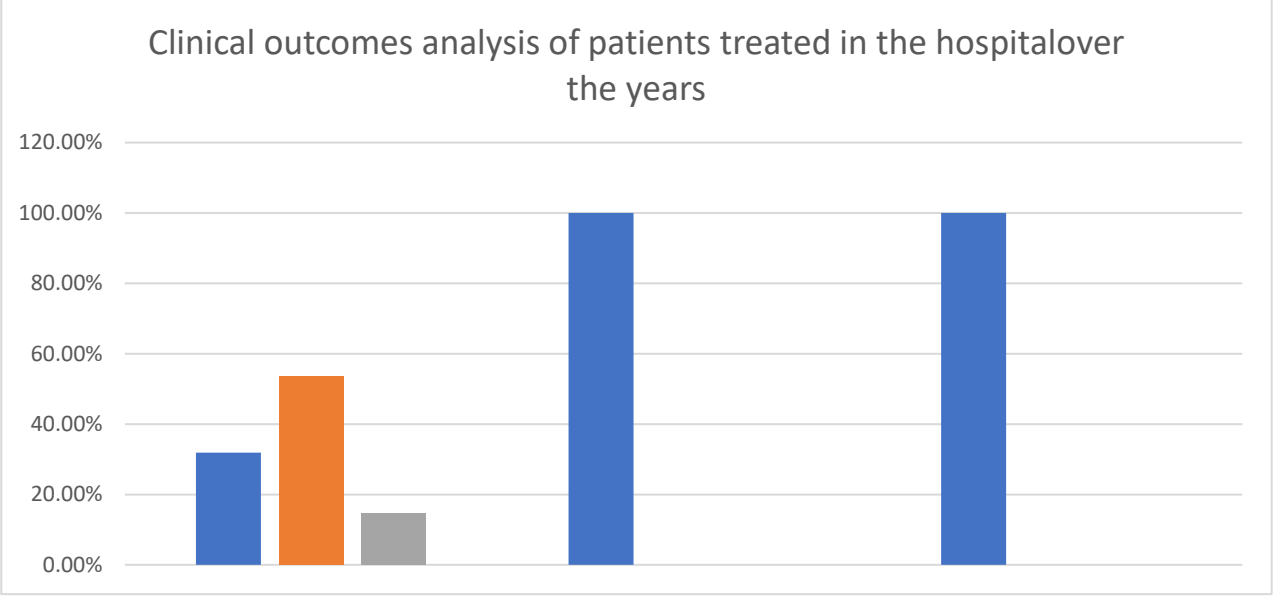

Figure 9

The above figure shows that when analyzing the clinical course of COVID-19 over the years, due to the isolation of any person with symptoms of the disease in 2020, when the COVID-19 pandemic began, all types of patients were treated in inpatient conditions. That is, 31.9% of the total number of patients treated were patients in severe and very severe condition, while 53.5% of patients were patients in moderate severity. The remaining 14.6% of patients were patients in mild disease. Consistently, all (100%) of the patients treated in inpatient conditions in 2021-2022 were patients in severe condition. During this time, patients in mild and partially moderate severity were treated on an outpatient basis.

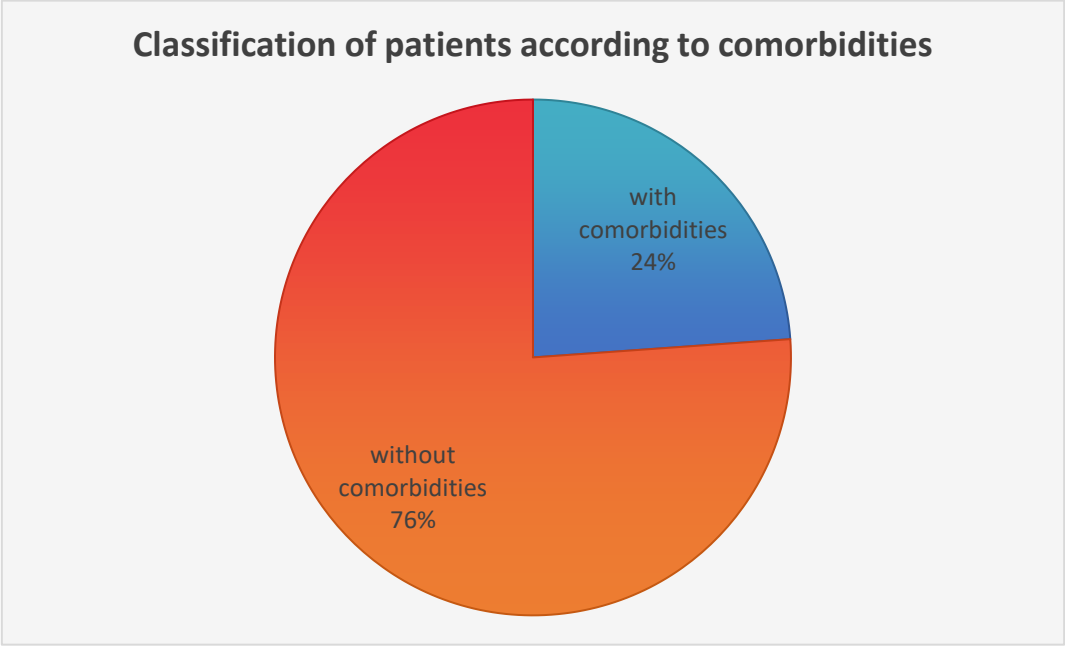

Figure 10

In turn, it can be seen from the above figure that a very large proportion of the total number of patients, i.e. 76.13%, did not have any comorbidities, while only 23.87% had comorbidities. This is due to the participation of patients of all age groups in the study, and the majority of comorbidities were noted in the older group of patients.

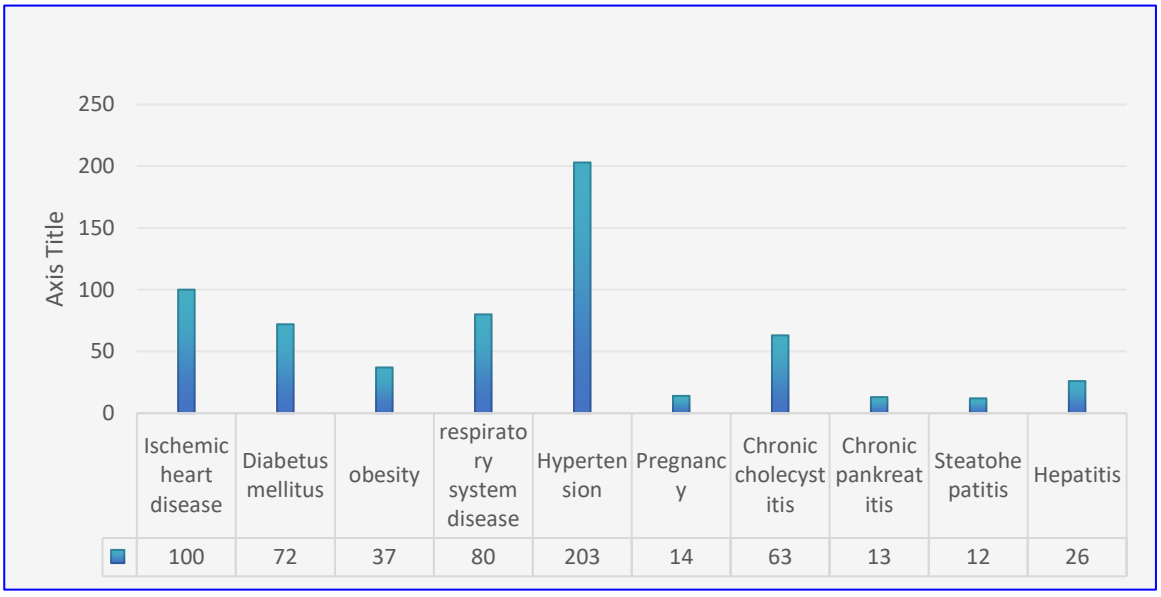

Figure 11

When analyzing the number of comorbidities observed in patients with COVID-19, hypertension and ischemic heart disease ranked high, followed by respiratory diseases and diabetes mellitus. That is why, this group of diseases are considered as a high medical risk.

CONCLUSION

When analyzing various factors related to the spread of COVID-19 worldwide, medical factors play a special role, along with social characteristics of the population. A retrospective analysis conducted on the example of Bukhara region showed that there are a number of relationships between the clinical course of the disease, severity levels, and the risk of complications from the disease and social characteristics in the spread of COVID-19.

In turn, when analyzing patients by age group, it can be seen that the incidence of the disease is higher in the socially active population. However, it can be observed that the severity of the disease and the degree of complications are higher in the population over 60 years of age. This is mainly explained by the weakening of the functional state of the immune system in the elderly population and the tendency to comorbidities.

When analyzing the spread of infectious diseases, emphasis is often placed on their gender sensitivity. When analyzing the gender characteristics of patients with COVID-19, it can be determined that men are slightly more likely to be infected than women. However, this does not mean that COVID-19 is more sensitive to the male gender. This is more likely due to the slightly higher proportion of men in the highly active communication layer in the Bukhara region.

The study confirmed that, in terms of territorial affiliation, the incidence of infection among urban residents is slightly higher than that among rural residents. In this process, the high population density among urban residents plays an important role in the chain of transmission of COVID-19.

The clinical course of COVID-19 can be directly affected by patients' comorbidities, which can aggravate the course of the

disease. Among the comorbidities present in patients, cardiovascular diseases occupy a significant place. In the next places, we can mention diseases of the respiratory system and endocrine system. In particular, when diabetes mellitus is among the comorbidities with other systemic diseases, the final indicators of treatment from the disease worsen significantly.
Developing preventive measures to prevent the spread of the disease, taking into account the above-mentioned social and medical factors, will effectively reduce the incidence rate among the population.

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