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Original article

ALAMA COVID-19 MEDICAL RISK ASSESSMENT TOOL - KOSOVO DEMOGRAPHIC EXPERIENCE

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Abstract

Introduction: The coronavirus disease 2019 (COVID-19) is an infectious disease caused by the newly discovered Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2).

Aim: In our study, we aimed to present the Kosovo's COVID-19 pandemic experience using the ALAMA COVID-19 Medical Risk Assessment tool to evaluate overall vulnerability as a part of the health assessment of fitness for work related to gender and age groups.

Material and methods: This analytical cross-sectional study was conducted during a period of two years (2020-2021) on a national sample of 200 patients with COVID-19 treated at the Clinical Center in Prishtina, Republic of Kosovo. All patients had a confirmed COVID-19 positive status by RC-PCR test.

Results: The average vulnerability of ALAMA COVID-19 Medical Risk Assessment score in the study group of patients was 46.42±19.92, with min/max of 20/85, and 50% of the patients had an ALAMA COVID-19 score of ≤43 (low vulnerability), with a median IQR = 43 (28-65). The average ALAMA COVID-19 score was higher in males compared to females: 50.21±20.09 *vs*. 42.74±19.14, respectively. Approximately 25% of males had an ALAMA COVID-19 score >70 (high vulnerability) compared to 25% of females with a score > 57 (moderate vulnerability). The ALAMA COVID-19 Medical Risk Assessment tool showed significantly higher vulnerability in male compared to female patients (p=0.0065).

Discussion: The ALAMA COVID-19 Medical Risk Assessment tool showed significantly higher vulnerability in male compared to female patients.

Keywords: risk assessment, COVID-19, ALAMA methodology

Introduction

The pandemic of coronavirus disease 2019 (COVID-19) is an infectious disease caused by a newly discovered Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2)[1]. Genetic sequencing of the virus suggests that it is a betacoronavirus closely linked to the SARS virus. By way of definition, a symptomatic COVID-19 case is a person who has developed signs and symptoms suggestive of COVID-19. Symptomatic transmission refers to transmission of SARS-CoV-2 from persons with symptoms. Epidemiology and virologic studies suggest that transmission mainly occurs from symptomatic people to others by close

contact through respiratory droplets, by direct contact with infected persons, or by contact with contaminated objects and surfaces[2-5].

Most people infected with the COVID-19 virus will experience mild to moderate respiratory illness and recover without requiring special treatment. Approximately 30% of pregnant women with COVID-19 experience preterm delivery, whereas the mean birth weight is 2855.9 g. Fetal death and detection of SARS-CoV-2 were observed in about 2%[6]. Older people and those with underlying medical problems like cardiovascular disease, diabetes, chronic respiratory disease and cancer are more likely to develop serious illness[7,8].

A cross-sectional study conducted on a sample of 69,054 university students in France showed self-reported prevalence of suicidal thoughts, severe distress, high level of perceived stress, severe depression, and high level of anxiety - 11.4%, 22.4%, 24.7%, 16.1%, and 27.5%, respectively. The following factors were associated with reporting at least 1 mental health outcome: female gender or nonbinary gender, precariousness, low-quality housing, history of psychiatric follow-up, symptoms compatible with COVID-19, social isolation, and low quality of the information received[9].

This pandemic has been characterized by a high variability in death rate (defined as the ratio between the number of deaths and the total number of infected people) across world countries. Several possible explanations have been proposed, but it is not clear whether this variability is due to a single predominant factor or instead to multiple causes[10].

Since the outbreak of COVID-19 pandemic, several hypotheses have been proposed to explain the great variability in the death rate across countries. The Italian study provided evidence that one of the most crucial factors affecting the death rate was the availability of hospital beds[11].

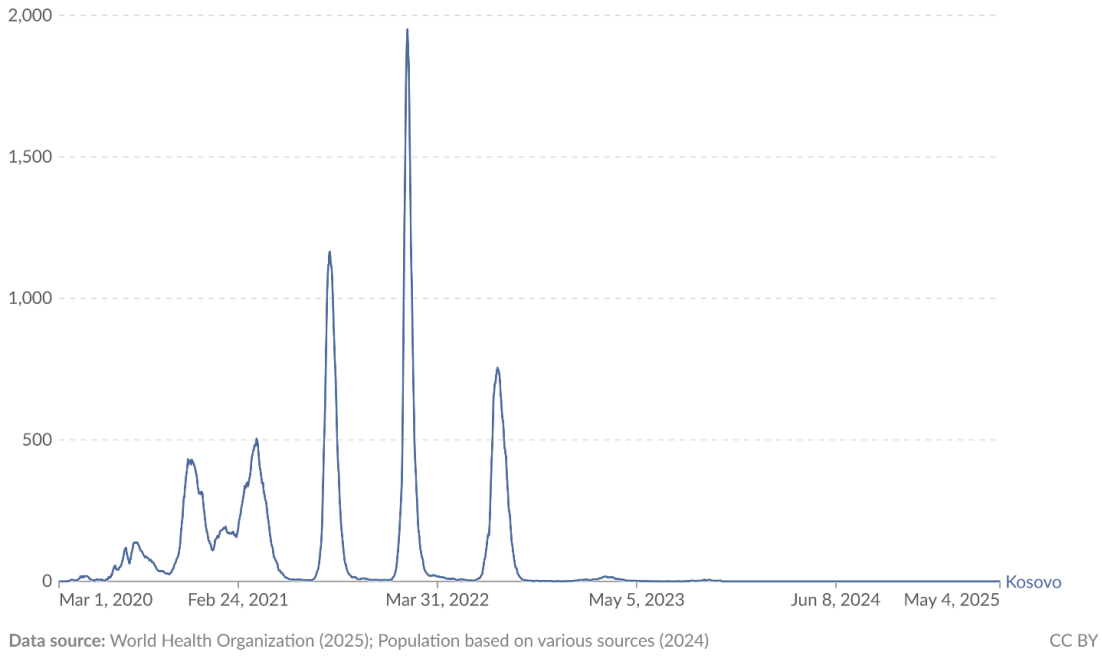

Fig. 1. Daily new confirmed Covid-19 cases in Kosovo per million people

To date, systemic corticosteroids remain the only treatment known to reduce mortality in patients with severe COVID-19, limiting treatment options and putting more pressure on supportive care alternatives such as oxygen support[12].

There is still uncertainty regarding the effectiveness of vaccines in reducing transmission and/or severity of illness or the duration of immunity they confer. Therefore, vaccines must be seen as a potential future tool to be used in conjunction with robust application of existing measures[13].

The COVID-19 pandemic has had a profound impact on the world, causing tens of millions of deaths, overwhelming healthcare systems, and disrupting societies and economies. According to the WHO data, from December 31, 2019 to December 31, 2024, a total of 777,074,803 cases of COVID-19 and 7,079,142 deaths have been reported and 13.64 billion doses of COVID-19 vaccine have been administered[14].

In Kosovo, from 08.02.2020 to 31.12.2024, a total of 2,004,191 tests were performed on suspected cases of the SARS-CoV-2 virus. A total of 276,174 cases were diagnosed[15]. As of December 2024, a total of 3,233 deaths have been registered. The mortality rate is 1.17% (Figure 1).

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In our study, we aimed to present the Kosovo COVID-19 pandemic experience in using the ALAMA COVID 19 Medical Risk Assessment tool to evaluate overall vulnerability as part of the health assessment of fitness for work related to gender and age groups.

Material and methods

The research was an analytical cross-sectional study that was applied during a period of two years 2020-2021 on a national sample of 200 patients with COVID-19 treated at the Clinical Center in Pristina, Republic of Kosovo. All of the patients had a confirmed COVID 19 positive status by RC-PCR test. Official medical records from National Institute of Public Health and other relevant health institutions were used for collecting the data of study interest.

The ALAMA COVID-19 Medical Risk Assessment tool was developed to assist health professionals in advising workers on their personal vulnerability to COVID-19, and implications for their employment. It varies according to age, sex, ethnicity, the presence of other health conditions (comorbidities), and immunity due to vaccination or previous infection. The ALAMA COVID-19 Medical Risk Assessment tool summarises published evidence on the impact of age, sex, ethnicity and comorbidities in the absence of vaccination or previous infection. It is intended for use as part of occupational health assessment of individuals' fitness for work.

Estimates of personal vulnerability from the ALAMA COVID-19 Medical Risk Assessment calculator are derived from published studies in populations with no SARS-CoV-2 previous infection or vaccination. Risks associated with health conditions are estimated as averages and may vary within a disease category. Clinical judgement was used to adjust the values where appropriate. For conditions with no available evidence, the added year estimates were derived from other similar conditions. The ALAMA COVID-19 Medical Risk Assessment calculator also estimates vulnerability in the absence of vaccination or previous infection. Risk depends also on history of vaccination/previous infection, local infection rates (viral prevalence), job role (and controls in place), and behaviours in relation to social distancing, hygiene and face-covering. Clinical judgement was also used to assign individuals in a higher or lower group where appropriate. The stratification used for the ALAMA COVID-19 Medical Risk Assessment vulnerability was as follows: a) age 85 and over = very high; b) age 70-84 = high; c) age 50-69 = moderate, and d) under 50 = low. A higher ALAMA COVID-19 Medical Risk Assessment score indicated higher vulnerability.

This study was conducted in accordance with the principles of the Helsinki Declaration of 1975, as revised in 2024.

Statistical analysis

The quantitative parameters were analyzed using mean, median, range and standard deviation. Categorical data were presented as counts and percentages. The Shapiro-Wilk W test was used to determine the normality of frequency distribution of age. The Mann Whitney U test was used to compare differences between genders related to ALAMA COVID-19 Medical Risk Assessment score. Data obtained were analyzed with the SPSS software package, version 22.0 for Windows (SPSS, Chicago, IL, USA). A two-sided analysis with a significance level of $p<0.05$ was used to determine statistical significance.

Results

Study group characteristics

A total of 200 patients that met the already established inclusion and exclusion criteria were recruited in the study. Among patients with COVID-19 confirmed by RC-PCR test, 98 (49.5%) were male and 101 (50.5%) were female. The male/ female ratio was 0.97:1.

The average age of patients in the study group was 46.86±19.73 years, with a median IQR=46 (31 – 63.5), and 50% of patients aged ≤46 years. Minimum and maximum age of patients in the study group was 1/87 years. The average age of males was 48.43±19.96 years, with a median IQR=47.5 (33 - 67), and of females 45.35±19.50 years, with a median IQR=44.5 (29-60). Approximately 50% of male and female patients were younger than 47 and 44 years, respectively. No significant difference was found between genders related to age (Z=(-1.172; p=0.2412) (Table 1).

Table 1. Comparison of ALAMA COVID-19 Medical Risk Assessment score by gender

Parameters	ALAMA COVID-19 Medical Risk Assessment score					p
	N	Mean± SD	Min / Max	Median	IQR	
Gender						
Male	98	50.21±20.09	20/85	47	33-70	Z=(2.721); p=0.0065*
Female	101	42.74±19.14	20/79	40	25-57	
Total	200	46.42±19.92	20/85	43	28-65	
Male – age groups						
≤50 years	55	34.47±9.19	20/50	36	27-41	Z=(-8.467; p=0.00001*
>50 years	43	70.34±9.20	50/85	72	65-75	
Total	98	50..21±20.09	20/85	47.5	33-70	
Female – age groups						
≤50 years	59	29.02±10.09	20/62	26	20-34	Z=(-8.244; p=0.00001*
>50 years	42	62.02±9.88	46/79	62	53-70	
Total	101	42.74±19.14	20/79	40	25-57	
Total - age groups						
≤50 years	114	31.64±10.01	20/62	30	22-39	Z=11.864; p=0.00001*
>50 years	85	66.23±10.37	46/85	69	56-75	
Total	199	46.42±19.92	20/85	43	28-65	
Male /Female – ≤50 years						
Male	55	34.47±9.19	20/50	36	27-41	Z=-3.302; p=0.001*
Female	59	29.02±10.09	20/62	26	20-34	
Total	114	31.64±10.01	20/62	30	22-39	
Male /Female – >50 years						
Male	43	70.34±9.20	50/85	72	65-75	Z=-3.645; p=0.00001*
Female	42	62.02±9.88	46/79	62	53-70	
Total	85	66.23±10.37	46/85	69	56-75	

SD – standard deviation; IQR – Interquartile range, *significant for p<0,05

ALAMA COVID-19 Medical Risk Assessment score

The average vulnerability of the ALAMA COVID-19 Medical Risk Assessment score in the study group of patients was 46.42±19.92, with min/max of 20/85, and 50% of patients had ALAMA COVID-19 score ≤43 (low vulnerability), with a median IQR = 43 (28-65). The average ALAMA COVID-19 score was higher in males compared to females: 50.21±20.09 *vs*. 42.74±19.14, respectively. Approximately 25% of males had an ALAMA COVID-19 score >70 (high vulnerability) compared to 25% of females with a score > 57 (moderate vulnerability).

The ALAMA COVID-19 Medical Risk Assessment tool showed significantly higher vulnerability in male compared to female patients (p=0.0065) (Table 1).

The study group of patients aged ≤50 years had an ALAMA COVID-19 score of 30 (low vulnerability), with a median IQR = 26 (20-34) that was significantly lower compared to patients aged >50 years where the score was 69 (moderate vulnerability), with a Median IQR = 62 (53-70) (p=0.00001) (Table 1).

The separate analysis by gender showed that in patients aged ≤50 years, the average ALAMA COVID-19 Medical Risk Assessment score was 31.64±10.01, with a median IQR=30 (22 – 39), which was significantly lower compared to that in patients aged > 50 years, 66.23±10.37, with a median IQR= 69 (56 - 75) (p=0.00001) (Table 1).

In the male group, 50% of patients aged ≤50 years had an ALAMA COVID-19 score ≤36 (low vulnerability), with a median IQR=36 (27 – 41) compared to those aged >50 years who had a score of ≤72 (high vulnerability), with a median IQR= 72 (65 – 75). Also, in the female group, 50% of patients aged ≤50 years had an ALAMA COVID-19 score of ≤26 (low vulnerability), with a median IQR =26 (20 – 34) compared to those aged >50 years who had a score of ≤62 (moderate vulnerability), with a median IQR=62 (53 – 70) (Table 1).

Additionally, it was found that females had significantly lower ALAMA COVID-19 Medical Risk Assessment scores compared to males, both overall (p=0.00001), and within each age groups separately: ≤50 years (p=0.001) and >50 years (p=0.00001) (Table 1).

Dıscussıon

The ALAMA COVID-19 Medical Risk Assessment scores showed significantly higher vulnerability in male compared to female patients in Kosovo.

It was found that females had significantly lower ALAMA COVID-19 Medical Risk Assessment scores compared to males, both overall and within age groups separately: -≤50 years and >50 years.

In Europe, approximately 75% of the population, corresponding to approx. 60 million European men and 71 million women, had at least one risk factor for severe COVID-19, 46% (approx. 36 million men and 43 million women) had at least two risk factors, and 21% (approx. 17 million men and 20 million women) had at least three risk factors. Overall, the prevalence of risk factors increased with age, until 80–89 years[14].

The prevalences were similar between the European regions, except for higher prevalence of risk factors in Eastern Europe, mainly explained by a higher prevalence in women in Eastern Europe compared with women in Northern, Western, and Southern Europe[15].

Age remains the strongest risk factor for severe COVID-19 outcomes, with risk of severe outcomes increasing markedly with increasing age. Based on data from the National Vital Statistics System (NVSS) at NCHS (Risk for COVID-19 Infection, Hospitalization, and Death by Age Group), compared with individuals aged 18-29 years, the risk of death is 25 times higher in those aged 50–64 years, 60 times higher in those aged 65-74 years, 140 times higher in those aged 75–84 years, and 340 times higher in those aged 85+ years. These data include

all deaths in the United States that occurred throughout the pandemic, from February 2020 to July 1, 2022, including deaths among unvaccinated individuals.

Risk of severe outcomes is increased in people of all ages with certain underlying medical conditions and in people who are 50 years and older, with risk increasing substantially at ages >65 years[14,15]. Residents of long-term care facilities are also at increased risk, making up less than 1% of the U.S. population but accounting for more than 35% of all COVID-19 deaths[16-21].

Conclusion

Male patients in Kosovo had significantly higher vulnerability (ALAMA score) than female patients overall.

Older patients (>50 years) had significantly higher ALAMA scores than younger patients, indicating age as a strong risk factor.

The difference in ALAMA scores between genders was consistent across all age groups, suggesting gender-specific vulnerability differences to COVID-19 risk.

Conflict of interest statement. None declared.

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