

## Low BMI and malnutrition, but not obesity, are risk factors for older adults dying from COVID-19

## September 21 2021

		COVID-19				Non-COVID-19			
Variable		N	Odds ratio		р	N	Odds ratio		р
Age		1409	:	1.13 (1.10, 1.17)	<0.001	8622		1.13 (1.09, 1.18)	<0.001
Sex	Women	765	•	Reference		5247	•	Reference	
	Men	644		2.46 (1.59, 3.84)	< 0.001	3375		1.47 (0.88, 2.45)	0.14
Number of diseases		1409	•	0.97 (0.86, 1.08)	0.551	8622	-	1.02 (0.84, 1.24)	0.82
CCI		1409	· <b>-</b>	1.25 (1.08, 1.45)	0.004	8622		1.37 (1.18, 1.58)	< 0.001
HFRS		1409	-	1.22 (1.02, 1.46)	0.027	8622	-	1.17 (1.02, 1.34)	0.02
Number of drugs		1409		1.05 (1.01, 1.10)	0.018	8622		1.06 (1.01, 1.11)	0.02
Wave	1st	846	•	Reference		5484		Reference	
	2nd	563	<b>—</b>	0.97 (0.63, 1.48)	0.897	3138		0.67 (0.37, 1.15)	0.16
ВМІ	Normal weight, 18.5 <bmi<25.0< td=""><td>709</td><td>•</td><td>Reference</td><td></td><td>4408</td><td>•</td><td>Reference</td><td></td></bmi<25.0<>	709	•	Reference		4408	•	Reference	
	Underweight, BMI<18.5	112		2.30 (1.17, 4.31)	0.012	847		0.84 (0.31, 1.88)	0.70
	Overweight, 25.0 <bmi<30.0< td=""><td>394</td><td><del></del></td><td>1.05 (0.63, 1.70)</td><td>0.861</td><td>2228</td><td></td><td>0.66 (0.33, 1.23)</td><td>0.21</td></bmi<30.0<>	394	<del></del>	1.05 (0.63, 1.70)	0.861	2228		0.66 (0.33, 1.23)	0.21
	Obese, BMI>30.0	194 -	<b></b>	1.23 (0.57, 2.45)	0.579	1139 -		0.67 (0.25, 1.52)	0.38

Figure 1. The fully adjusted mortality risk model for the BMI analysis in geriatric patients hospitalized for COVID-19 (n = 1409, 112 died) and other causes (n = 8622, 67 died). Abbreviations: BMI = body mass index, CCI = Charlson comorbidity index, HFRS = Hospital Frailty Risk Score. Credit: DOI: 10.1016/j.clnu.2021.07.025

A recent study published in *Clinical Nutrition* shows that low BMI and malnutrition are risk factors for in-hospital mortality in geriatric COVID-19 patients. The study was performed at Karolinska Institutet in collaboration with Theme Inflammation & Aging at Karolinska University Hospital and geriatric clinics in the Stockholm Region.

These results are important as information on the groups with the highest mortality, i.e. the very old and <u>frail patients</u>, is underrepresented. For



example, obesity is a risk factor in COVID-19 infection in younger adults but we instead found that low BMI and malnutrition increased the risk of in-hospital mortality in geriatric COVID-19 patients who were mostly older than 75 years, says Ph.D. Laura Kananen, a researcher at the Department of medical epidemiology and biostatistics, KI.

## **COVID-19** in hospitalized geriatric patients

During the first COVID-19 wave in the spring 2020 in Sweden, researchers at Karolinska Institutet reported that in-hospital mortality was 24% among older hospitalized geriatric patients. The risk of death was almost doubled for patients classified as frail according to the Clinical Frailty Scale (CFS) as compared to non-frail older patients. In these patients, acute kidney injury and multimorbidity were also strong risk factors for death.

## BMI and nutritional status as risk factors?

The role of body composition and nutritional status in COVID-19 pathology has not been characterized well in hospitalized <u>older adults</u> (>65 years). Therefore, in our study, we analyzed the associations of body mass index, and nutritional status assessed using Mini Nutritional Assessment-Short Form (MNA-SF) with in-geriatric <u>hospital mortality</u> in older patients treated for COVID-19. As a reference, the analyses were performed also in older patients who were hospitalized for other causes than COVID-19 in the same geriatric hospitals during the same time period. Data in the analysis comprised medical records of ~10 000 patients in Stockholm during the first two pandemic waves. Age range of the patients was from 65 to 105 years, and their median age was 83 years. Follow-up of survival was short, i.e., only the hospitalization period.



The major finding of this study was that indicators of undernutrition; i.e., underweight (BMI

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