Effect of body mass index on cardiac injury/cardiovascular outcomes in coronavirus disease 2019: a systematic review and meta-analysis
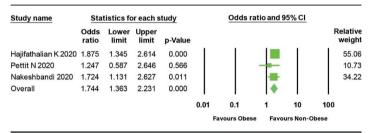
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Coronavirus disease 2019 has affected millions of people worldwide. Its clinical spectrum ranges from completely asymptomatic to significant respiratory and non-respiratory symptoms leading to critical illness, including death. We aimed to study the effects of body mass index (BMI) on cardiovascular and other critical illness outcomes in these patients in the USA. We conducted a systematic search of three databases for the period of November 2019 to August 2020 and selected 37 studies for analysis. One study showed a non-significant difference in cardiac injury among BMI groups, but there is a paucity of data on cardiovascular outcomes among different BMI groups; hence, meta-analysis was not done for cardiovascular outcomes. Both high BMI and cardiac injury are independent predictors of poor outcomes in these patients. Pooled analysis showed obesity as a significant risk factor for intensive care unit admission (OR=1.547, CI=1.208–1.981, P=0.001) and intubation /mechanical ventilation (OR=1.744, CI=1.363–2.231 P=0.000). Therefore, BMI should be considered an important part of risk stratification, and vaccination should be prioritized for obese patients when it becomes widely available.

Study name	Odds ratio	Lower limit	Upper limit	p-Value	Odds ratio and 95% CI	Relative weight
Hajifathalian K 2020	1.875	1.345	2.614	0.000		55.06
Pettit N 2020	1.247	0.587	2.646	0.566		10.73
Nakeshbandi 2020	1.724	1.131	2.627	0.011		34.22
Overall	1.744	1.363	2.231	0.000		

0.01   0.1   1   10   100

Favours Obese   Favours Non-Obese

Random Effects Model

Risk of intubation