Table 1. Main characteristics of the epidemiological studies.

Author/ Year	Study Design	Country of Study	Total Number of Patients	Number of Patients with MAFLD (%)	Mean Body Mass Index ± SD kg/m2	Mean Age ± SD (Range) Years	Male/ Female Ratio	Assessment of MAFLD (test or score criteria)	Assessment of COVID-19	Study Outcomes	Patient Co-Morbidities	New-Castle-Ottawa Score
Bramante et al., 2020[22]	Retrospective cohort study	USA	6700	373 (5.5%)	35.3 ± 8.2	46 (28-66)	44%: 56%	Patients with MAFLD were defined by ICD codes or with BMI > 30 or with High ALT done 3 times on separate dates	SARS-CoV-2 infection positive with PCR	COVID-19 severity, ICU admission and mortality	Obesity, Hypertension, DM2	7
Mahamid et al., 2020[23]	Case-control study	Israel	71	22 (31%)	29.2 ± 4.3	53.7 ± 19.9	28.2%: 71.8%	New definition of MAFLD: an international expert consensus statement from 202 and CT imaging of liver.	SARS-CoV-2 infection positive by RT-PCR assay of nasal and oropharyngeal swab	The relationship of COVID-19 severity and MAFLD	Obesity, Hypertension, DM2	8
Targher et al., 2020[24]	Retrospective study	China	310	94 (30.3%)	26.5 ± 4.7	41.2 ± 14.2	58.53%: 41.7%	MAFLD diagnosis was made based on hepatic steatosis on CT scan	COVID-19 PCR laboratory confirmed	Risk of severe COVID-19 due to MAFLD	Obesity, Hypertension, DM2	8
Targher et al., 2020[25]	Retrospective study	China	339	59 (17.4%) with diabetes and obesity	25.0 ± 4.3	57.0 ± 11.7	52.2%: 47.8%	MAFLD was diagnosed if patients were positive for DM2 self-reported history and have HbA1c > 6.5%	COVID-19 PCR laboratory confirmed	Presence of metabolic deregulation (DM2) associated with COVID-19 severity	Obesity, Hypertension, DM2	8
Zhou et al., 2020[26]	Retrospective cohort study	China	327	93 (28.4%)	NA	NA	NA	Recent consensus criteria were used for MAFLD diagnosis	COVID-19 PCR of oropharyngeal swab specimen laboratory confirmed	COVID-19 severity	Obesity, Hypertension, DM2	7

Zheng et al., 2020[27]	**Cohort study**	China	214	66 (31%)	26.5 ± 3.9	NA	64.2%: 25.8%	MAFLD diagnosed by CT liver (presence of steatosis)	Laboratory confirmed COVID-19 by RT-PCR	COVID-19 severity	Obesity, Hypertension, DM2	7
Chen et al., 2020[28]	Retrospective cohort study	USA	342	178 (52%)	30 (25.9-36.0)	63 (52-73)	53.5%: 46.5%	Patients with MAFLD were diagnosed by liver imaging or by hepatic steatosis index >36 for Asians and > 39 for non-Asians	SARS-CoV-2 infection positive with PCR	Severity of cardiopulmonary disease, transaminitis, jaundice, and portal hypertensive complications	Obesity, Hypertension, DM2, Dyslipidemia	8
Forlano et al., 2021[30]	Prospective cohort study	UK	193	61 (31.6%)	30.6 (27-33.8)	60 (53-75)	60%: 40%	Patients with MAFLD were diagnosed either by imaging of the liver within one year of admission or by known diagnosis of MAFLD from patient records.	SARS-CoV-2 infection positive with PCR	Clinical characteristics and outcomes of MAFLD patients with COVID-19	Obesity, DM2, Hypertension, Dyslipidemia, Ischemic Heart Disease, Lung Disease, CKD	8
Gao et al., 2020[30]	Prospective cohort study	China	150	75 (50%)	27.7 ± 2.7	48	62.7%: 57.3%	No mention of MAFLD; only obesity	SARS-CoV-2 infection positive with PCR	Association between obesity and severity of COVID-19 infection	Obesity, DM2	7
Marjot el al., 2021[33]	Retrospective cohort study	UK (origin) but data is multinational	1365	322 (23.5%)	NA	59 (47-68)	62%: 38%	Presence of MAFLD was determined based on submitted report from clinical records	SARS-CoV-2 infection positive with PCR	Hospitalizations, ICU admissions and mortality	Smoking, Obesity, Heart Disease, DM, HTN, COPD, HCC, Non-HCC CA	7

Parlak et al., 2021[35]	Retrospective cohort study	Turkey	343	55 (16%)	NA	48.43 ± 16.85	58.6%: 41.3%	Patients with MAFLD were diagnosed by the presence of diffuse hepatic steatosis on any prior imaging or liver histology in the absence of secondary causes of hepatic fat accumulation	SARS-CoV-2 infection positive with PCR	COVID-19 severity, ICU admissions, mortality, incidence of livery injury, degree of lung lobe involvement	DM, HTN, CAD, COPD, CKD	7
Gao et al., 2021[36]	Retrospective cohort study	China	130	65 (50%)	NA	46 (33-59)	66%: 34%	Patients with MAFLD were defined by the evidence of hepatic steatosis on CT + one of the following: BMI >/= 23kg/m2, presence of T2DM or presence of metabolic dysregulation	COVID positive by high throughput sequencing or PCR of oropharyngeal swab	COVID-19 severity	Obesity, HTN, CLD, Smoking, overweight, metabolic dysregulation, fatty liver	7
Hashemi et al., 2020[37]	Retrospective cohort study	USA	363	55 (15.2%)	30.3 ± 6.6	63.4 ± 16.5	56%: 44%	Patients with MAFLD were defined by the presence of diffuse hepatic steatosis on any prior imaging or liver histology in the absence of secondary causes of hepatic fat accumulation	COVID positive by PCR of nasopharyngeal swab or tracheal aspirate	ICU admission, mechanical ventilation needs, in hospital mortality, length of stay	HTN, DM, cardiac conditions, and pulmonary diseases	8

| Lopez-Mendez et al., 2020[38] | Retrospective cohort study | Mexico | 155 | 66 (42.6%) | 27.9 ± 2.1 | 51 (42-62) | 71%: 29% | Hepatic Steatosis Index (HSI): 8*Alanine Aminotransferase (ALT) / Aspartate Aminotransferase (AST) + BMI (+2 if T2DM, +2 if female), which detects metabolic associated fatty liver diseases (MAFLD) with a value above 36 | RT-PCR SARS-CoV-2 test in nasopharyngeal swab | Mortality and ICU Admission | Obesity, Hypertension, DM2 | 8 |
| Huang et al., 2020[40] | Retrospective cohort study | China | 280 | 86 (30.7%) | 24 ± 2 | 43 (32-56) | 53%: 48% | Hepatic Steatosis Index (HSI): 8*Alanine Aminotransferase (ALT) / Aspartate Aminotransferase (AST) + BMI (+2 if T2DM, +2 if female), which detects Metabolic Associated Fatty Liver Diseases (MAFLD) with a value above 36. | SARS-CoV-2 throat swab samples by PCR | COVID-19 severity, ICU admission and mortality | HTN, DM2, Chronic Lung Disease, Malignant Tumor | 8 |

| Ji et al., 2020[41] | Retrospective cohort study | China | 202 | 76 (37.6% | 24 ± 2.8 | 44.5 (34.8-54.1) | 60%: 40% | Hepatic Steatosis Index (HSI): 8*Alanine Aminotransferase (ALT) / Aspartate Aminotransferase (AST) + BMI (+2 if T2DM, +2 if female), which detects Metabolic Associated Fatty Liver Diseases (MAFLD) with a value above 36 | SARS-CoV-2 throat swab samples by PCR | Progression to Severe Covid-19, Viral shedding time | NR | 7 |

Abbreviations: MAFLD: metabolic-associated fatty liver disease, BMI: body mass index, SARS-CoV-2: severe acute respiratory syndrome coronavirus-2, HTN: hypertension, CLD: chronic liver disease, T2DM: type2 diabetes mellitus, CVD: cardiovascular disease, ALT: alanine aminotransferase, AST: aspartate aminotransferase, RT-PCR: reverse transcriptase polymerase chain reaction, ICD-10: international classification for disease code, NOS: New-Castle-Ottawa Score.