Table S1 – Search strategy

Database: PubMed

((("Cannula"[Mesh]) OR ((((((Cannula[Title/Abstract]) OR (Cannulae[Title/Abstract])) Cannula[Title/Abstract])) OR (Cannula, Nasal[Title/Abstract])) OR (Nasal Cannulae[Title/Abstract])) OR (Cannulae, OR (COVID 19[Title/Abstract])) OR (SARS-CoV-2 Infection[Title/Abstract])) OR (Infection, SARS-CoV-2[Title/Abstract])) OR (SARS CoV 2 Infection[Title/Abstract])) OR (SARS-CoV-2 Infections[Title/Abstract])) OR (2019 Novel Coronavirus Disease[Title/Abstract])) OR (2019 Novel Coronavirus Infection[Title/Abstract])) OR (2019-nCoV Disease[Title/Abstract])) OR (2019 nCoV Disease[Title/Abstract])) OR (2019-nCoV Diseases[Title/Abstract])) OR (Disease, 2019-nCoV[Title/Abstract])) OR (COVID-19 Virus Infection[Title/Abstract])) OR (COVID 19 Virus Infection[Title/Abstract])) OR (COVID-19 Virus Infections[Title/Abstract])) OR (Infection, COVID-19 Virus[Title/Abstract])) OR (Virus Infection, COVID-OR (Coronavirus 2019[Title/Abstract])) OR 19[Title/Abstract])) Disease (Disease 2019 Coronavirus[Title/Abstract])) OR (Coronavirus Disease-19[Title/Abstract])) OR (Coronavirus Disease 19[Title/Abstract])) OR (Severe Acute Respiratory Syndrome Coronavirus 2 Infection[Title/Abstract])) OR (SARS Coronavirus 2 Infection[Title/Abstract])) OR (COVID-19 Virus Disease[Title/Abstract])) OR (COVID 19 Virus Disease[Title/Abstract])) OR (COVID-19 Virus Diseases[Title/Abstract])) OR (Disease, COVID-19 Virus[Title/Abstract])) OR (Virus Disease, COVID-19[Title/Abstract])) OR (2019-nCoV Infection[Title/Abstract])) OR (2019 nCoV Infection[Title/Abstract])) OR (2019-nCoV Infections[Title/Abstract])) OR (Infection, 2019nCoV[Title/Abstract])) OR (COVID19[Title/Abstract])) OR (COVID-19 Pandemic[Title/Abstract])) OR (COVID-19 Pandemic[Title/Abstr COVID-19[Title/Abstract])) Pandemic[Title/Abstract])) OR (Pandemic, OR (COVID-19 Pandemics[Title/Abstract])))) AND (("Oxygen Inhalation Therapy"[Mesh]) OR (((((Oxygen Inhalation Therapy[Title/Abstract]) OR (Inhalation Therapy, Oxygen[Title/Abstract])) OR (Inhalation Therapies, Oxygen[Title/Abstract])) OR (Oxygen Inhalation Therapies[Title/Abstract])) OR (Therapies, Oxygen Inhalation[Title/Abstract])) OR (Therapy, Oxygen Inhalation[Title/Abstract])))

Database: Embase

#17. #12 AND #15 AND #16

#16. #3 OR #6 OR #9

#15, #13 OR #14

#14. 'oxygen therapy':ab,ti OR 'o2 administration':ab,ti OR 'o2 therapy':ab,ti OR 'oxygen administration':ab,ti OR 'oxygen inhalation therapy':ab,ti OR 'oxygen insufflation':ab,ti OR 'oxygen treatment':ab,ti

#13. 'oxygen therapy'/exp

#12. #10 OR #11

#11. 'coronavirus disease 2019':ab,ti OR '2019 novelcoronavirus disease':ab,ti OR '2019 novel coronavirus epidemic':ab,ti OR '2019 novel coronavirus infection':ab,ti OR '2019-ncov disease':ab,ti OR '2019-ncov infection':ab,ti OR 'coronavirus disease 2':ab,ti OR 'coronavirus disease 2010':ab,ti OR 'coronavirus disease 2019 pneumonia':ab,ti OR 'coronavirus disease-19':ab,ti OR 'coronavirus infection 2019':ab,ti OR covid:ab,ti OR 'covid 19 induced pneumonia':ab,ti OR 'covid 2019':ab,ti OR 'covid 10':ab,ti OR 'covid 19':ab,ti OR 'covid-19 induced pneumonia':ab,ti OR 'covid-19 pneumonia':ab,ti OR covid19:ab,ti OR 'ncov 2019 disease':ab,ti OR 'ncov 2019 infection':ab,ti OR 'new coronavirus pneumonia':ab,ti OR 'novel coronavirus 2019 disease':ab,ti

OR 'novel coronavirus 2019 infection':ab,ti OR 'novel coronavirus disease 2019':ab,ti OR 'novel coronavirus infected pneumonia':ab,ti OR 'novel coronavirus infected pneumonia':ab,ti OR 'novel coronavirus infection 2019':ab,ti OR 'novel coronavirus pneumonia':ab,ti OR 'paucisymptomatic coronavirus disease 2019':ab,ti OR 'sars coronavirus 2 infection':ab,ti OR 'sars coronavirus 2 pneumonia':ab,ti OR 'sars-cov-2 disease':ab,ti OR 'sars-cov-2 infection':ab,ti OR 'sars-cov-2 pneumonia':ab,ti OR 'sars-cov-2 disease':ab,ti OR 'sars-cov-2 infection':ab,ti OR 'sars-cov-2 disease':ab,ti OR 'sars-cov-2 infection':ab,ti OR 'severe acute respiratory syndrome 2':ab,ti OR 'severe acute respiratory syndrome 2 pneumonia':ab,ti OR 'severe acute respiratory syndrome coronavirus 2 infection':ab,ti OR 'severe acute respiratory syndrome coronavirus 2019 infection':ab,ti OR 'severe acute respiratory syndrome cov-2 infection':ab,ti OR 'wuhan coronavirus disease':ab,ti OR 'wuhan coronavirus infection':ab,ti

- #10. 'coronavirus disease 2019'/exp
- #9. #7 OR #8
- #8. ((('high flow nasal cannula therapy':ab,ti OR 'hfoxygen therapy':ab,ti OR hfnc:ab,ti) AND 'high flow nasal cannula':ab,ti OR 'hfnc assisted ventilation':ab,ti OR 'hfnc therapy':ab,ti OR 'hfnc ventilation':ab,ti OR hfnct:ab,ti) AND 'high flow nasal cannula therapy':ab,ti OR 'high flow nasal cannula':ab,ti OR 'high flow nasal cannula respiratory support':ab,ti OR 'high flow nasal canula':ab,ti OR 'high flow nasal prong therapy':ab,ti OR 'high flow nasal therapy':ab,ti OR 'high flow oxygenation therapy':ab,ti OR 'high flow':ab,ti) AND hf:ab,ti AND 'oxygen therapy':ab,ti OR 'high-flow oxygen treatment':ab,ti OR 'highflow nasal cannula':ab,ti OR 'highflow nasal cannula therapy':ab,ti OR 'nasal high flow':ab,ti
- #7. 'high flow nasal cannula therapy'/exp
- #6. #4 OR #5
- #5. 'oxygen nasal cannula':ab,ti OR 'acucarehfnc':ab,ti OR 'basic nasal oxygen cannula':ab,ti OR 'basic nasal oxygen delivery catheter':ab,ti OR 'basic oxygen nasal cannula':ab,ti OR 'carbon dioxide sampling cannula':ab,ti OR 'carbon dioxide sampling nasal oxygen cannula':ab,ti OR 'carbon-dioxide-sampling nasal oxygen cannula':ab,ti OR 'cpap nasal oxygen cannula':ab,ti OR 'dispo med':ab,ti OR 'kentron capnography':ab,ti OR 'nasal oxygen cannulae':ab,ti OR 'nasal oxygen delivery catheter':ab,ti OR 'niv linemicrostream':ab,ti OR 'oxygen delivery nasal catheter':ab,ti
- #4. 'oxygen nasal cannula'/exp
- #3. #1 OR #2
- #2. 'nasal cannula':ab,ti OR filterline:ab,ti OR'nasal canula':ab,ti OR 'nasal tube':ab,ti OR 'nose cannula':ab,ti OR 'nose tube':ab,ti OR 'optiflow nasal cannula':ab,ti OR 'pro-flow nasal cannula':ab,ti OR 'smart capnoline':ab,ti

Database: Web of Science

#1 TS=(Cannula) 20941

#2 AB=(Cannula OR Cannulae OR (Nasal Cannula) OR (Cannula, Nasal) OR (Nasal Cannulae) OR (Cannulae, Nasal)) 16968

#3 #1 OR #2 20941

#4 TS=(COVID-19) 272414

#5 AB=((COVID-19) OR (COVID 19) OR (SARS-CoV-2 Infection) OR (Infection, SARS-CoV-2) OR (SARS CoV 2 Infection) OR (SARS-CoV-2 Infections) OR (2019 Novel Coronavirus Disease) OR (2019 Novel Coronavirus Infection) OR (2019-nCoV Disease) OR (2019 nCoV Disease) OR (2019-nCoV Diseases) OR (Disease, 2019-nCoV) OR (COVID-19 Virus Infection) OR (COVID 19 Virus Infection) OR (COVID-19 Virus Disease 2019) OR (Disease 2019, Coronavirus) OR (Coronavirus Disease-19) OR (Coronavirus Disease 19) OR (Severe

Acute Respiratory Syndrome Coronavirus 2 Infection) OR (SARS Coronavirus 2 Infection) OR (COVID-19 Virus Disease) OR (COVID 19 Virus Disease) OR (COVID-19 Virus Disease) OR (Disease, COVID-19 Virus) OR (Virus Disease, COVID-19) OR (2019-nCoV Infection) OR (2019 nCoV Infection) OR (2019-nCoV Infections) OR (Infection, 2019-nCoV) OR (COVID19) OR (COVID-19 Pandemic) OR (COVID 19 Pandemic) OR (Pandemic, COVID-19) OR (COVID-19 Pandemics)) 198041

#6 #4 OR #5 278439

#7 TS=(Oxygen Inhalation Therapy) 1367

#8 AB=((Oxygen Inhalation Therapy) OR (Inhalation Therapy, Oxygen) OR (Inhalation Therapies, Oxygen) OR (Oxygen Inhalation Therapies) OR (Therapies, Oxygen Inhalation) OR (Therapy, Oxygen Inhalation)) 613
#9 #7 OR #8 1367

#10 #3 AND #6 AND #9 5

Database: Cochrane Library

- #1 MeSH descriptor: [Cannula] explode all trees
- #2 (Cannula or Cannulae or Nasal Cannula or Cannula, Nasal or Nasal Cannulae or Cannulae, Nasal):ti,ab,kw (Word variations have been searched)
- #3 #1 or #2
- #4 MeSH descriptor: [COVID-19] explode all trees
- #5 (COVID-19 or COVID 19 or SARS-CoV-2 Infection or Infection, SARS-CoV-2 or SARS CoV 2 Infection or SARS-CoV-2 Infections or 2019 Novel Coronavirus Disease or 2019 Novel Coronavirus Infection or 2019 nCoV Disease or COVID-19 Virus Infection or COVID 19 Virus Infection or COVID-19 Virus Infections or Infection, COVID-19 Virus or Virus Infection, COVID-19 or Coronavirus Disease 2019 or Disease 2019, Coronavirus or Coronavirus Disease-19 or Coronavirus Disease 19 or Severe Acute Respiratory Syndrome Coronavirus 2 Infection or SARS Coronavirus 2 Infection or COVID-19 Virus Disease or COVID-19 Virus Disease or COVID-19 Virus Disease or COVID-19 Virus Disease, COVID-19 or 2019 nCoV Infection or COVID19 or COVID-19 Pandemic or COVID 19 Pandemic or Pandemic, COVID-19 or COVID-19 Pandemics):ti,ab,kw (Word variations have been searched)
- #6 #4 or #5
- #7 MeSH descriptor: [Oxygen Inhalation Therapy] explode all trees
- #8 (Oxygen Inhalation Therapy or Inhalation Therapy, Oxygen or Inhalation Therapies, Oxygen or Oxygen Inhalation Therapies or Therapies, Oxygen Inhalation or Therapy, Oxygen Inhalation):ti,ab,kw (Word variations have been searched)
- #9 #7 or #8
- #10 #3 and #6 and #9

Table S2 Methodological quality (cohort studies)

Dear Dr./Prof. ***,

Hope this e-mail finds you well.

My name is Yang Li and I'm a researcher from Jiangsu Provincial Key Laboratory of Critical Care Medicine, Department of Critical Care Medicine, Zhongda Hospital, School of Medicine, Southeast University, Nanjing, Jiangsu, China.

Recently our group are performing a systematic review and meta-analysis to investigate the effect of high-flow nasal cannula therapy (HFNC) versus conventional oxygen therapy (COT) on intubation rate, 28-day ICU mortality, 28-day ventilator-free days (VFDs) and ICU length of stay (ICU LOS) in adult patients with acute respiratory failure (ARF) by COVID-19. Your paper entitled "***" is of significant importance in this topic. Of course, your excellent work will be included into the meta-analysis. However, some important information and data have not been reported in the paper. We would appreciate it if you could provide us the following data: _____. By the way, on behalf of our group, we will add your contribution in the acknowledgement part of the article. We believe that this paper will result in a good publication.

Your help is of great importance, and the results of the meta-analysis may be useful for future studies.

We are looking forward to hearing from you.

Kindest regards

Table S3 Methodological quality (cohort studies)

		Selec	tion	Comparability		_			
Study	Representative of exposed cohort	Selection of non-exposed cohort	Ascertainment of exposure	Demonstratio n that outcome was not present at start of study	Comparability of cohorts based on design and analysis	Assessment of outcome	Timing of follow-up	Adequate follow-up	Overall quality assessment
Bonnet, 2021	*	*	*	*	*	*	*	*	8
COVID-ICU group,	*	*	*	*	*	*	*	*	8
2021									
Demoule, 2020	*	*	*	*	*	*	*	*	8
Hansen, 2021	*	*	*	*	*	*	*	*	8
Sayan, 2021	*	*	*	*	*	*	*	*	8
Wendel Garcia, 2021	*	*	*	*	*	*	*	*	8
Wendel Garcia, 2022	*	*	*	*	*	*	*	*	8

Table S4 GRADE evidence profile for the studies in the meta-analysis

					Quality assessme	nt		No. of patients		Effect			
Outcomes	No. of Outcomes Study design studies	Risk of	T	T 11	Imprecision	Publication	HFNC	COT	Relative	Absolute	Evidence quality	Importance	
		bias	Inconsistency	Indirectness		bias	HENC	СОТ	(95% CI)	(95% CI)			
IR	7	1 RCT, 6 Cohort	Not serious	Serious ^a	Not serious	Not serious	NA ^b	762/1438	1202/1818	OR 0.44	199 fewer per 1,000 (from 80 fewer to	Low	CRITICAL
										(0.28, 0.71)	308 fewer)		
M	6	1RCT, 5 Cohort	Not serious	Not serious	Not serious	Not serious	NA ^b	174/942	265/1241	OR 0.54	86 fewer per 1,000 (from 5 fewer to	Moderate	CRITICAL
										(0.30, 0.97)	138 fewer)		
VFD	4	1 RCT, 3 Cohort	Not serious	Not serious	Not serious	Not serious	NA ^b	229	242	_	MD 2.58 higher (1.7 to 3.45 higher)	Moderate	IMPORTANT
LOS	8	2 RCT, 6 Cohort	Not serious	Serious ^c	Not serious	Serious d	NA ^b	1334	1656	-	MD 0.52 higher (1.01 lower to 2.06	Very low	IMPORTANT
											higher)		

HFNC: high flow nasal cannula, COT: conventional oxygen therapy, CI: confidence interval, OR: odds ratio, MD: mean difference

NA: not applicable

a. I2=85%, the heterogeneity was high

b. Publication bias could not be determined as the number of studies was less than 10

c. I2=80%, the heterogeneity was high

d. Wide confidence interval including benefits and harms

Figure S1 Risk of bias graph

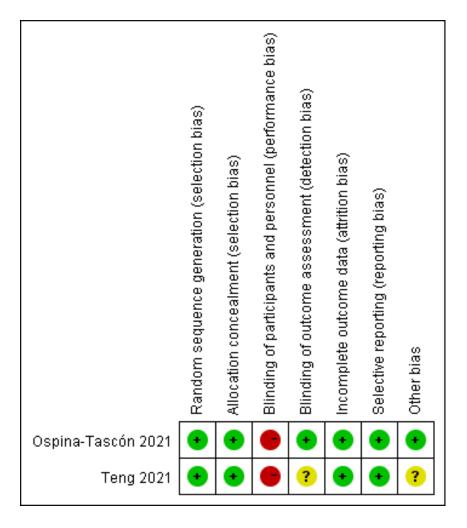


Figure S2 Risk of bias summary

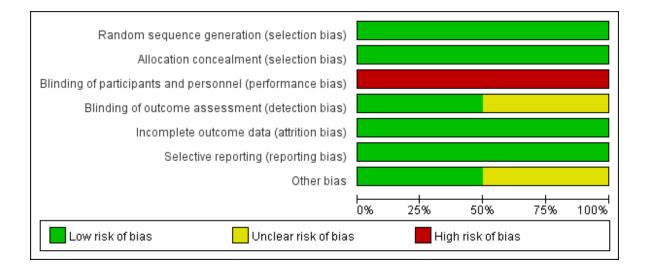


Figure S3 Funnel plot for intubation rate

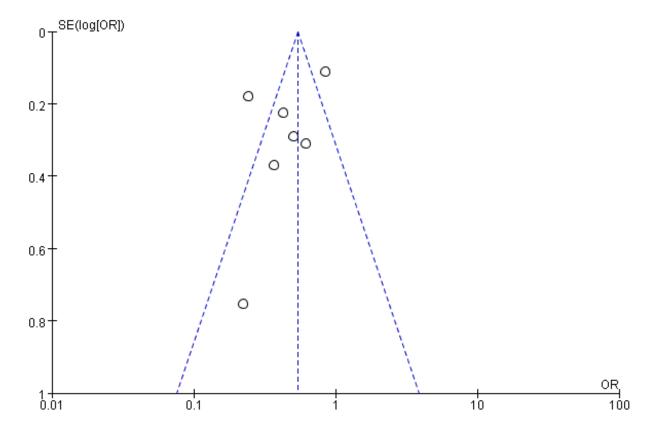


Figure S4 Trial sequential analysis of weaning success

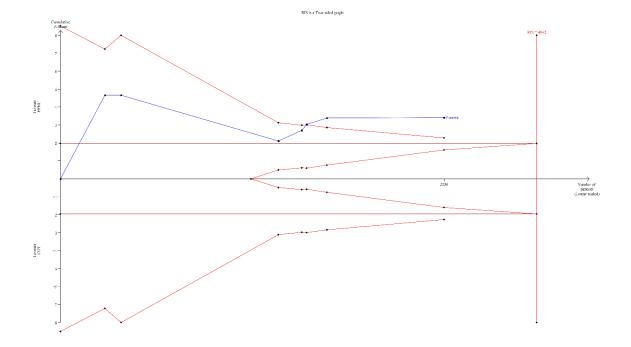


Figure S5 Subgroup analysis of intubation rate between the two groups with regard to type of ARF

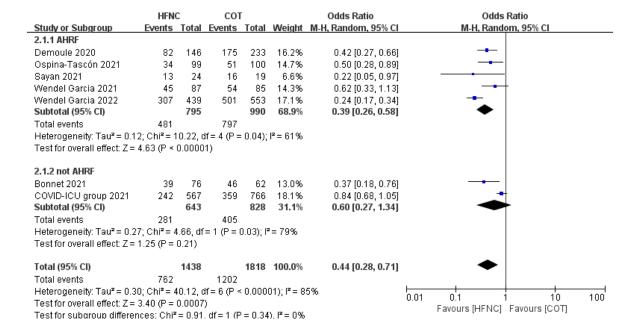


Figure S6 Subgroup analysis of mortality between the two groups with regard to type of ARF

HFNC			COT	Γ		Odds Ratio	Odds Ratio			
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% CI	M-H, Random, 95% CI			
2.2.1 AHRF										
Demoule 2020	30	146	70	233	21.0%	0.60 [0.37, 0.98]	-			
Hansen 2021	9	30	33	61	15.2%	0.36 [0.14, 0.92]				
Ospina-Tascón 2021	8	99	16	100	15.5%	0.46 [0.19, 1.13]				
Sayan 2021	12	24	16	19	9.6%	0.19 [0.04, 0.82]				
Subtotal (95% CI)		299		413	61.3%	0.49 [0.34, 0.71]	◆			
Total events	59		135							
Heterogeneity: Tau ² = 0.0	10 ; $Chi^2 = 2$	2.74, df	= 3 (P = 1)	0.43); l ^a	2= 0%					
Test for overall effect: Z=	3.71 (P =	0.0002)							
2.2.2 not AHRF										
Bonnet 2021	9	76	15	62	15.4%	0.42 [0.17, 1.04]				
COVID-ICU group 2021	106	567	115	766	23.2%	1.30 [0.97, 1.74]	 -			
Subtotal (95% CI)		643		828	38.7%	0.81 [0.27, 2.41]				
Total events	115		130							
Heterogeneity: Tau ² = 0.5	i2; Chi ² = 6	5.41, df	= 1 (P = I	0.02); l ^a	²= 82%					
Test for overall effect: Z=	0.39 (P =	0.70)								
Total (95% CI)		942		1241	100.0%	0.54 [0.30, 0.97]	•			
Total events	174		265							
Heterogeneity: Tau ² = 0.3	86; Chi * = 2	21.57, 0	f= 5 (P =	0.000	6); P = 779	%	100 100			
Test for overall effect: Z =	2.06 (P =	0.04)	,				0.01 0.1 1 10 100			
Test for subgroup differences: $Chi^2 = 0.71$. $df = 1$ ($P = 0.40$). $I^2 = 0\%$										

Figure S7 Subgroup analysis of VFDs between the two groups with regard to type of ARF

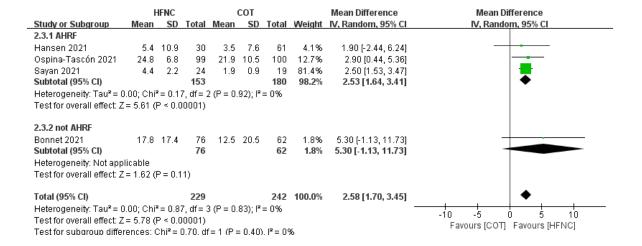


Figure S8 Subgroup analysis of LOS between the two groups with regard to type of ARF

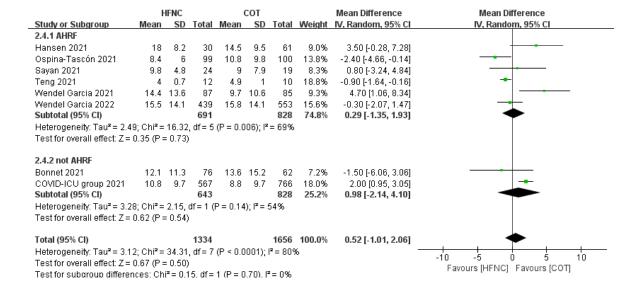


Figure S9 Subgroup analysis of intubation rate between the two groups with regard to OI

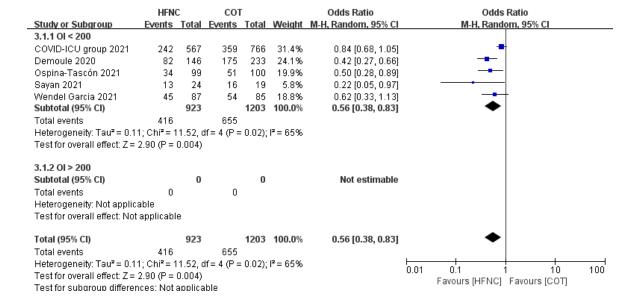


Figure S10 Subgroup analysis of mortality between the two groups with regard to OI

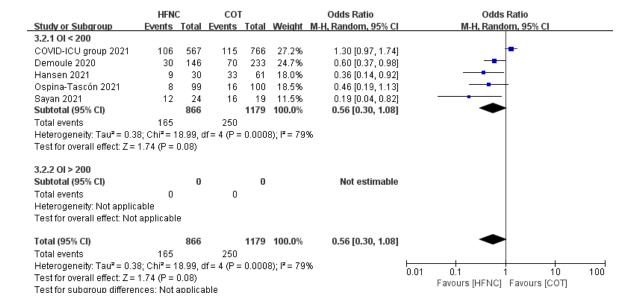


Figure S11 Subgroup analysis of VFDs between the two groups with regard to OI

	- 1	IFNC			COT			Mean Difference	Mean Difference		
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI		
3.3.1 New Subgroup											
Hansen 2021	5.4	10.9	30	3.5	7.6	61	4.1%	1.90 [-2.44, 6.24]			
Ospina-Tascón 2021	24.8	6.8	99	21.9	10.5	100	12.9%	2.90 [0.44, 5.36]	_ 		
3ayan 2021	4.4	2.2	24	1.9	0.9	19	83.0%	2.50 [1.53, 3.47]	🖷		
Subtotal (95% CI)			153			180	100.0%	2.53 [1.64, 3.41]	◆		
Heterogeneity: Tau² = (0.00; Chi ²	$^{2} = 0.1$	7, df = 2	2(P = 0.	92); l²	= 0%					
Test for overall effect: 2	Z = 5.61 (I	P < 0.0	00001)								
3.3.2 OI > 200											
Subtotal (95% CI)			0			0		Not estimable			
Heterogeneity: Not app	licable										
Test for overall effect: N	lot applic	able									
Total (95% CI)			153			180	100.0%	2.53 [1.64, 3.41]	•		
Heterogeneity: Tau² = (0.00; Chi²	$^{2} = 0.1$	7, df = 2	2(P = 0.	92); l²	= 0%		-	-10 -5 0 5 10		
Test for overall effect: Z = 5.61 (P < 0.00001)									Favours [COT] Favours [HFNC]		
Test for subaroup diffe	rences: N	Not ap	plicable	е					ravours [CO1] ravours [HrNC]		

Figure S12 Subgroup analysis of LOS between the two groups with regard to OI

	HFNC				сот			Mean Difference	Mean Difference		
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI		
3.4.1 OI < 200											
COVID-ICU group 2021	10.8	9.7	567	8.8	9.7	766	22.1%	2.00 [0.95, 3.05]	-		
Hansen 2021	18	8.2	30	14.5	9.5	61	12.5%	3.50 [-0.28, 7.28]			
Ospina-Tascón 2021	8.4	6	99	10.8	9.8	100	17.9%	-2.40 [-4.66, -0.14]			
Sayan 2021	9.8	4.8	24	9	7.9	19	11.7%	0.80 [-3.24, 4.84]			
Wendel Garcia 2021	14.4	13.6	87	9.7	10.6	85	12.9%	4.70 [1.06, 8.34]			
Subtotal (95% CI)			807			1031	77.1%	1.52 [-0.86, 3.89]	-		
Heterogeneity: Tau ^z = 5.0	Heterogeneity: Tau ² = 5.08; Chi ² = 16.51, df = 4 (P = 0.002); i ² = 76%										
Test for overall effect: Z=	1.25 (P =	= 0.21)	1								
3.4.2 OI > 200											
Teng 2021	4	0.7	12	4.9	1	10	22.9%	-0.90 [-1.64, -0.16]	-		
Subtotal (95% CI)			12			10	22.9%	-0.90 [-1.64, -0.16]	•		
Heterogeneity: Not applica	able										
Test for overall effect: Z=	2.40 (P =	= 0.02)	i								
Total (95% CI)			819			1041	100.0%	0.94 [-1.00, 2.89]	•		
Heterogeneity: Tau ² = 4.1	6; Chi ^z =	33.68	, df = 5	(P < 0.0]	0001)	; I² = 85	i%		10 10 10 10		
Test for overall effect: Z=	0.95 (P =	= 0.34)		•		-			-10 -5 0 5 10		
Test for subaroup differer	nces: Ch	i² = 3.6	33. df=	1 (P = 0	i.06). P	²= 72.4	%		Favours [HFNC] Favours [COT]		

Figure S13 Subgroup analysis of IR between the two groups with regard to type of research

