

# BMJ Open Clinical practice guidelines and expert consensus statements on rehabilitation for patients with COVID-19: protocol for a systematic review

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## ABSTRACT

**Introduction** COVID-19 is a highly infectious disease, characterised by respiratory, physical and psychological dysfunctions. Rehabilitation could effectively alleviate the symptoms and promote recovery of the physical and mental health of patients with COVID-19. Recently, rehabilitation medical institutions have issued clinical practice guidelines (CPGs) and expert consensus statements involving recommendations for rehabilitation assessments and rehabilitation therapies for COVID-19. This systematic review aims to assess the methodological quality and reporting quality of the guidance documents, evaluate the heterogeneity of the recommendations and summarise the recommendations with respect to rehabilitation assessments and rehabilitation therapies for COVID-19 to provide a quick reference for front-line clinicians, therapists and patients as well as reasonable suggestions for future guidelines.

**Methods and analysis** The electronic databases including PubMed, Embase, Chinese Biomedical Literature Database (CBM), Chinese Science and Technology Periodical Database (VIP), Wanfang Database and China National Knowledge Infrastructure (CNKI) and websites of governments or organisations (eg, National Guideline Clearinghouse, Guidelines International Network, National Institute for Health and Clinical Excellence, Scottish Intercollegiate Guidelines Network and WHO) will be searched for eligible CPGs and expert consensus statements published in Chinese or English and presenting recommendations for modern functional rehabilitation techniques and/or traditional Chinese medicine rehabilitation techniques for COVID-19 will be included. Reviews, interpretations, old versions of CPGs and expert consensus statements and those for the management of other diseases during the pandemic will be excluded. Two reviewers will independently review each article, extract data, appraise the methodological quality following the Appraisal of Guidelines for Research & Evaluation II tool and assess the reporting quality with the Reporting Items for Practice Guidelines in Healthcare statement. The Measurement Scale of Rate of Agreement will be used to evaluate the heterogeneity of the recommendations in different CPGs and expert consensus statements. Agreement between reviewers will be calculated using the intraclass correlation coefficient.

## STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ This systematic review will comprehensively evaluate the methodological and reporting quality of clinical practice guidelines (CPGs) and expert consensus statements, strictly following the Appraisal of Guidelines for Research & Evaluation (AGREE) II instrument and the Reporting Items for Practice Guidelines in Healthcare (RIGHT) statement.
- ⇒ The Measurement Scale of Rate of Agreement will be used to compare the heterogeneity of recommendations in different CPGs and expert consensus statements.
- ⇒ The reviewers will be trained to use the AGREE II instrument and the RIGHT tool, and the intraclass correlation coefficient will be calculated to test the consistency between the two assessors.
- ⇒ This study will include CPGs and expert consensus statements published in Chinese or English, so any guidance produced in other languages will be excluded.
- ⇒ The validity of the recommendations on rehabilitation for patients with COVID-19 cannot be evaluated.

We will also summarise the recommendations for rehabilitation in patients with COVID-19. The results will be narratively described and presented as tables or figures.

**Ethics and dissemination** Ethics approval is not needed for this systematic review because information from published documents will be used. The findings will be submitted for publication in a peer-reviewed journal and reported in accordance with Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines.

**PROSPERO registration number** CRD42020190761.

## INTRODUCTION

COVID-19 was declared a pandemic by the WHO on 11 March 2020 and has affected more than 200 countries, with 551 226 298 confirmed cases and 6 345 595 deaths worldwide until 8 July 2022.<sup>1–3</sup> COVID-19 has posed a huge threat to global public health, the economy and other aspects of people's daily life.<sup>4</sup> During hospitalisation, patients with

COVID-19 may suffer from multisystem dysfunctions, including respiratory, cardiovascular, haematological, renal, digestive, neurological, psychiatric and metabolic systems.<sup>5–7</sup> Of those patients with discharged COVID-19, 76% of them have at least one or more symptoms, the most common symptoms were fatigue or muscle weakness (63%) and sleep difficulties (26%), accompanied by anxiety or depression (23%).<sup>8</sup> Meanwhile, COVID-19 vaccination has been developed as a safe and effective strategy to reduce mortality and severe ICU admission.<sup>9</sup> Recently, long COVID-19 syndrome has been used to describe persistent or developmental symptoms and signs after acute COVID-19.<sup>10</sup> Long COVID-19 syndrome is manifested as fatigue, muscle weakness, sleep difficulties, palpitations, joint/muscle pain, dizziness, chest pain and so on.<sup>8 11</sup> Long COVID-19 affects people's ability to resume normal life and work, increases the medical burden and causes the loss of economy and productivity.<sup>10</sup> Therefore, COVID-19 infection and its long-term sequelae are worthy of attention because the function of these people may deteriorate and require social welfares/medical healthcare in the future.<sup>12</sup>

A systematic review of five randomised controlled trials confirmed that rehabilitation could improve dyspnoea, muscle strength, walking capacity, sit-to-stand performance, anxiety and quality of life of patients with COVID-19.<sup>13</sup> Rehabilitation therapies should be carried out as early as possible to reduce the complications and disability rate and improve the patients' overall function at different stages of COVID-19.<sup>5 14 15</sup> So far, numerous clinical practice guidelines (CPGs) and expert consensus statements of rehabilitation for patients with COVID-19 have been published,<sup>16–19</sup> and they have been developed to assist practitioners and patients in making decisions about appropriate healthcare for specific circumstances.<sup>20</sup> Notwithstanding, the different emphases of the guidelines, inconsistent or biased recommendations, low certainty of evidences in CPGs and expert consensus statements may decrease clinical application.<sup>21 22</sup> Moreover, low methodological quality may reduce the reliability of CPGs and expert consensus statements, attenuate compliance of CPGs and expert consensus statements in clinical practice, waste medical resources and lead to confusion among clinicians, therapists and patients.<sup>23 24</sup> The reporting quality of CPGs and expert consensus statements are also important. Non-standard reporting can decrease the clarity and integrity of the content, and provide unclear guidance for guideline users.<sup>25</sup> Therefore, CPGs and expert consensus statements with high methodological quality and reporting quality can save medical resources and costs and improve patients' care and safety.

So far, the methodological quality and reporting quality of CPGs and expert consensus statements of rehabilitation for COVID-19 have not been evaluated. Thus, this systematic review aims to assess the methodological quality and reporting quality of CPGs and expert consensus statements of rehabilitation for COVID-19 with

the Appraisal of Guidelines for Research & Evaluation (AGREE) II tool and the Reporting Items for Practice Guidelines in Healthcare (RIGHT) statement. Moreover, the heterogeneity of recommendations in different CPGs and expert consensus statements will be appraised using the Measurement Scale of Rate of Agreement (MSRA) and the current recommendations of rehabilitation for COVID-19 will be summarised to provide some valuable suggestions for guideline users and the formulation of related guidelines of rehabilitation for COVID-19 in the future.

## METHODS AND ANALYSIS

### Protocol registration

This protocol was registered on the International Prospective Register of Systematic Reviews.

### Eligibility criteria

#### Inclusion criteria

The inclusion criteria are: (1) CPGs and expert consensus statements of rehabilitation for COVID-19 issued by nationally or internationally recognised government authorities, medical/academic societies or organisations; (2) CPGs and expert consensus statements focusing on patients with COVID-19. Patients with COVID-19 who are clinically diagnosed using any recognised diagnostic criteria (such as positive real-time quantitative PCR detection of new coronavirus nucleic acid and highly homologous with known new coronavirus<sup>26</sup>). There are no restrictions on age, gender, race or nationality; (3) CPGs and expert consensus statements that provide recommendations for modern functional rehabilitation techniques (eg, respiratory training, peripheral muscle training, psychosocial support and occupational therapies, etc) and/or traditional Chinese medicine rehabilitation techniques (eg, tuina, acupuncture, moxibustion and Tai Chi, etc); (4) if there are multiple versions of the CPGs and expert consensus statements, the latest version will be included.

#### Exclusion criteria

CPGs and expert consensus statements not published in Chinese and English, and reviews, interpretations and guidance for the management of other diseases during the pandemic will be excluded.

### Search strategy

The databases including PubMed, Embase, Chinese Biomedical Literature Database (CBM), Chinese Science and Technology Periodical Database (VIP), Wanfang Database, and China National Knowledge Infrastructure (CNKI) will be searched from inception to August 2022. In addition, other international online repositories of guidelines, including the National Guideline Clearinghouse, Guidelines International Network, Scottish Intercollegiate Guidelines Network, National Institute for Health and Clinical Excellence and WHO will be

searched using terms related to rehabilitation therapies, COVID-19, guidelines and expert consensus statements. The full-search strategies of each database are displayed in online supplemental file 1. The relevant websites of advising bodies or healthcare organisations (such as the European Society of Physical and Rehabilitation Medicine, American Congress of Rehabilitation Medicine, Canadian Association of Physical Medicine and Rehabilitation, etc) will also be searched. Rehabilitation experts in this field will be consulted, and the reference lists of potentially eligible citations will be reviewed. Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flowchart is demonstrated in online supplemental file 2.

### Study selection

All retrieved records will be imported into EndNote V.X9 reference management software. After removing the duplicates, two reviewers (YZ and Y-XL) will independently review the titles and abstracts to identify potential records and download the full texts for further screening. Any disagreements will be resolved in discussion with a third reviewer (JL).

### Data extraction

Two reviewers (D-LZ and Y-XL) will extract the data independently using a standardised data extraction form, including: (1) the characteristics of CPGs and expert consensus statements: title, country of origin and publication year; (2) stages of disease; (3) recommended rehabilitation assessments; (4) recommended rehabilitation treatment; (5) related contents of methodological quality and reporting quality. The extracted data will be cross-checked by two reviewers, and any disagreements will be resolved through team discussion.

### Quality assessment

The methodological quality and reporting quality of the included CPGs and expert consensus statements will be evaluated using AGREE II tool and RIGHT statement, respectively. Two assessors (YZ and Y-YZ) will study the AGREE II User's Manual and appraise guidelines with My AGREE PLUS online appraisal platform ([www.agreetrust.org](http://www.agreetrust.org)) to practice the AGREE II tool. Two assessors (Y-XL and D-LZ) will study RIGHT checklist and detailed explanatory documents with examples ([www.annals.org](http://www.annals.org)). Trained assessors will preassess and discuss the samples of eligible records and then independently assess the methodological quality and reporting quality of the included CPGs and expert consensus statements. Discrepancies will be discussed and resolved through consultation with a third reviewer (R-JJ).

### Methodological quality

The AGREE II instrument is developed to evaluate the development and methodological quality of guidelines with high construct validity.<sup>27</sup> The AGREE II consists of two overall assessment with 23 items covering six domains: (1) scope and purpose (items 1–3), (2)

stakeholder involvement (items 4–6), (3) rigour of development (items 7–14), (4) clarity of presentation (items 15–17), (5) applicability (items 18–21) and (6) editorial independence (items 22–23). Each item is ranked on a seven-point scale (1: strongly disagree to 7: strongly agree), and the standardised score is calculated using the AGREE II formula ((obtained score from all raters—minimum possible score from all raters)/(maximum possible score for all raters—minimum possible score for all raters))×100. According to the criteria of previous guideline appraisals, 5 or 6 domains scoring >60% are usually considered as high quality, 3 or 4 domains scoring >60% are usually considered as moderate quality, 2 or fewer domains scoring >60% are usually considered as low quality.<sup>28 29</sup>

### Reporting quality

The RIGHT statement is used to evaluate the reporting quality of the CPGs and expert consensus statements, which helps to report guidelines transparently and standardly.<sup>25</sup> It includes seven domains (22 items in total): (1) basic information (items 1–4), (2) background (items 5–9), (3) evidence (items 10–12), (4) recommendations (items 13–15), (5) review and quality assurance (items 16–17), (6) funding, declaration and management of interest (items 18–19) and (7) other information (items 20–22). Each item is judged as 'yes' (relevant information is sufficiently reported) or 'no' (relevant information is lacking).<sup>30</sup>

### Heterogeneity assessment in rehabilitation entries

If at least four CPGs and expert consensus statements recommend similar rehabilitation suggestions for patients with COVID-19, the MSRA will be used to compare the heterogeneity of this recommendation in different CPGs and expert consensus statements.<sup>31–33</sup> The scoring criteria are 0%–20%: radically different; 20%–40%: numerous major differences; 40%–60%: some major differences; 60%–80%: only minor differences; 80%–100%: essentially identical.<sup>34 35</sup>

### Data analysis

To assess the agreement between reviewers, the intraclass correlation coefficient (ICC) will be calculated using SPSS V.25.0. The scores will be defined as: poor 0.0–0.2, fair 0.21–0.4, moderate 0.41–0.6, good 0.61–0.8 and very good 0.81–1.00.<sup>36</sup>

The recommended rehabilitation assessments and therapies will be presented in textual description and tables. We will stratify our findings according to the clinical staging system of COVID-19 (including early, development, critical and recovery stage). The reporting rate of each item and overall rate will be listed in tables to reflect the methodological quality and reporting quality of the included CPGs and expert consensus statements.

### Patient and public involvement

None.



## Ethics and dissemination

No ethics approval is required for this systematic review because information from published documents will be used. Our findings will be published in a peer-reviewed journal and reported in accordance with PRISMA guidelines.

## DISCUSSION

This systematic review has several strengths. Firstly, to our knowledge, this will be the first systematic review to comprehensively assess the methodological quality and reporting quality of CPGs and expert consensus statements on rehabilitation for COVID-19. Secondly, the appraisers will be extensively trained to use the AGREE II instrument and the RIGHT tool, and ICC will be calculated to test the consistency between the assessors. Thirdly, the MSRA will be used to evaluate the heterogeneity of recommendations in the CPGs and expert consensus statements. Fourthly, we will summarise the recommendations of rehabilitation assessments and therapies for COVID-19 in CPGs and expert consensus statements according to the disease stages.

Nonetheless, this study also has some limitations. Firstly, there may be language bias as only CPGs and expert consensus statements published in Chinese or English will be included. Secondly, the validity of the recommendations on rehabilitation for COVID-19 cannot be evaluated.

It is anticipated that the findings will provide reasonable suggestions to develop higher quality CPGs and expert consensus statements or improve existing guidelines, and quick references for COVID-19 rehabilitation therapies for clinicians, therapist and patients.

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**Contributors** JL designed the study. YZ, Y-XL and D-LZ drafted the manuscript. Y-XL and YZ will search the literature. YZ, Y-YZ, Y-XL and D-LZ will conduct the quality assessment. D-LZ and Y-XL will analyse the data. R-JJ and JL revised the manuscript. YZ, Y-XL and D-LZ contributed equally to this work and shared first authorship. All authors approved the manuscript.

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**Patient and public involvement** Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

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**Supplementary file 1. Search Strategy****Search Strategy for PubMed**

Number	Search terms
#1	Coronavirus[MeSH Terms]
#2	coronavirus infections[MeSH Terms]
#3	COVID-19[Title/Abstract] OR COVID-19 pneumonia[Title/Abstract] OR novel coronavirus[Title/Abstract] OR novel coronavirus pneumonia[Title/Abstract] OR coronaviru*[Title/Abstract] OR 2019-ncov [Title/Abstract] OR 2019-ncov pneumonia[Title/Abstract] OR novel cov[Title/Abstract] OR severe acute respiratory syndrome cov2[Title/Abstract] OR SARS-CoV-2[Title/Abstract] OR severe acute respiratory disease[Title/Abstract]
#4	#1 OR #2 OR #3
#5	rehabilitation [MeSH Terms]
#6	rehab*[Title/Abstract] OR respiratory rehabilitation [Title/Abstract] OR pulmonary rehabilitation [Title/Abstract] OR exercise therap* [Title/Abstract] OR physio[Title/Abstract] OR physiotherap*[Title/Abstract] OR physical therap*[Title/Abstract] OR PT[Title/Abstract] OR traditional Chinese medicine rehabilitation [Title/Abstract]
#7	#5 OR #6
#8	guideline[Title/Abstract] OR practice guideline[Title/Abstract] OR CPG[Title/Abstract] OR consensus development conference[Title/Abstract] OR consensus[Title/Abstract] OR consensus statement[Title/Abstract] OR expert consensus[Title/Abstract] OR standards[Title/Abstract] OR recommendation[Title/Abstract]
#9	#4 AND #7 AND #8

**Search Strategy for Embase**

Number	Search terms
#1	'coronavirus disease 2019'/exp
#2	'covid-19':ti,ab,kw OR 'covid-19 pneumonia':ti,ab,kw OR 'novel coronavirus':ti,ab,kw OR 'novel coronavirus pneumonia':ti,ab,kw OR coronaviru*:ti,ab,kw OR '2019 ncov':ti,ab,kw OR '2019-ncov pneumonia':ti,ab,kw OR 'novel cov':ti,ab,kw OR 'severe acute respiratory syndrome cov2':ti,ab,kw OR 'sars cov 2':ti,ab,kw OR 'severe acute respiratory disease':ti,ab,kw
#3	#1 OR #2
#4	'rehabilitation'/exp
#5	rehab*:ti,ab,kw OR 'respiratory rehabilitation':ti,ab,kw OR 'pulmonary rehabilitation':ti,ab,kw OR 'exercise therap':ti,ab,kw OR physio:ti,ab,kw OR

	physiotherap*:ti,ab,kw OR 'physical therap*:ti,ab,kw OR pt:ti,ab,kw OR 'traditional chinese medicine rehabilitation':ti,ab,kw
#6	#4 OR #5
#7	'guideline'/exp
#8	guideline:ti,ab,kw OR 'practice guideline':ti,ab,kw OR cpq:ti,ab,kw OR 'consensus development conference':ti,ab,kw OR consensus:ti,ab,kw OR 'consensus statement':ti,ab,kw OR 'expert consensus':ti,ab,kw OR standards:ti,ab,kw OR recommendation:ti,ab,kw
#9	#7 OR #8
#10	#3 AND #6 AND #9

### Search Strategy for CBM

Number	Search terms
#1	COVID-19 OR SARS-CoV-2 OR 冠状病毒 OR 严重急性呼吸综合征 OR 非典型肺炎 OR 2019 新型冠状病毒 OR 肺炎 OR 呼吸衰竭[常用字段:智能]
#2	康复 OR 呼吸康复 OR 肺康复 OR 运动训练 OR 物理疗法 OR 中医康复 OR 太极拳 OR 八段锦 OR 六字诀 OR 传统功法 OR 冥想 OR 针刺 OR 艾灸 OR 针灸 OR 灸法 OR 穴位敷贴 OR 推拿 OR 按摩[常用字段:智能]
#3	指南 OR 专家共识 OR 专家意见 OR 指导意见 OR 建议 OR 方案 OR 标准 OR 规范 OR 推荐 OR 共识声明[常用字段:智能]
#4	#1 AND #2 AND #3

### Search Strategy for VIP

Number	Search terms
#1	题名或关键词:COVID-19 OR SARS-CoV-2 OR 冠状病毒 OR 严重急性呼吸综合征 OR 非典型肺炎 OR 2019 新型冠状病毒 OR 肺炎 OR 呼吸衰竭
#2	题名或关键词:康复 OR 呼吸康复 OR 肺康复 OR 运动训练 OR 物理疗法 OR 中医康复 OR 太极拳 OR 八段锦 OR 六字诀 OR 传统功法 OR 冥想 OR 针刺 OR 艾灸 OR 针灸 OR 灸法 OR 穴位敷贴 OR 推拿 OR 按摩
#3	题名或关键词:指南 OR 专家共识 OR 专家意见 OR 指导意见 OR 建议 OR 方案 OR 标准 OR 规范 OR 推荐 OR 共识声明
#4	#1 AND #2 AND #3

### Search Strategy for Wan Fang database

Number	Search terms
#1	题名或关键词:COVID-19 OR SARS-CoV-2 OR 冠状病毒 OR 严重急性呼吸综合征 OR 非典型肺炎 OR 2019 新型冠状病毒 OR 肺炎 OR 呼吸衰竭
#2	题名或关键词:康复 OR 呼吸康复 OR 肺康复 OR 运动训练 OR 物理疗法 OR 太极拳 OR 中医康复 OR 八段锦 OR 六字诀 OR 传统功法 OR 冥想 OR 针刺

#3	OR 艾灸 OR 针灸 OR 灸法 OR 穴位敷贴 OR 推拿 OR 按摩 题名或关键词:指南 OR 专家共识 OR 专家意见 OR 指导意见 OR 建议 OR 方案 OR 标准 OR 规范 OR 推荐 OR 共识声明
#4	#1 AND #2 AND #3

### Search Strategy for CNKI

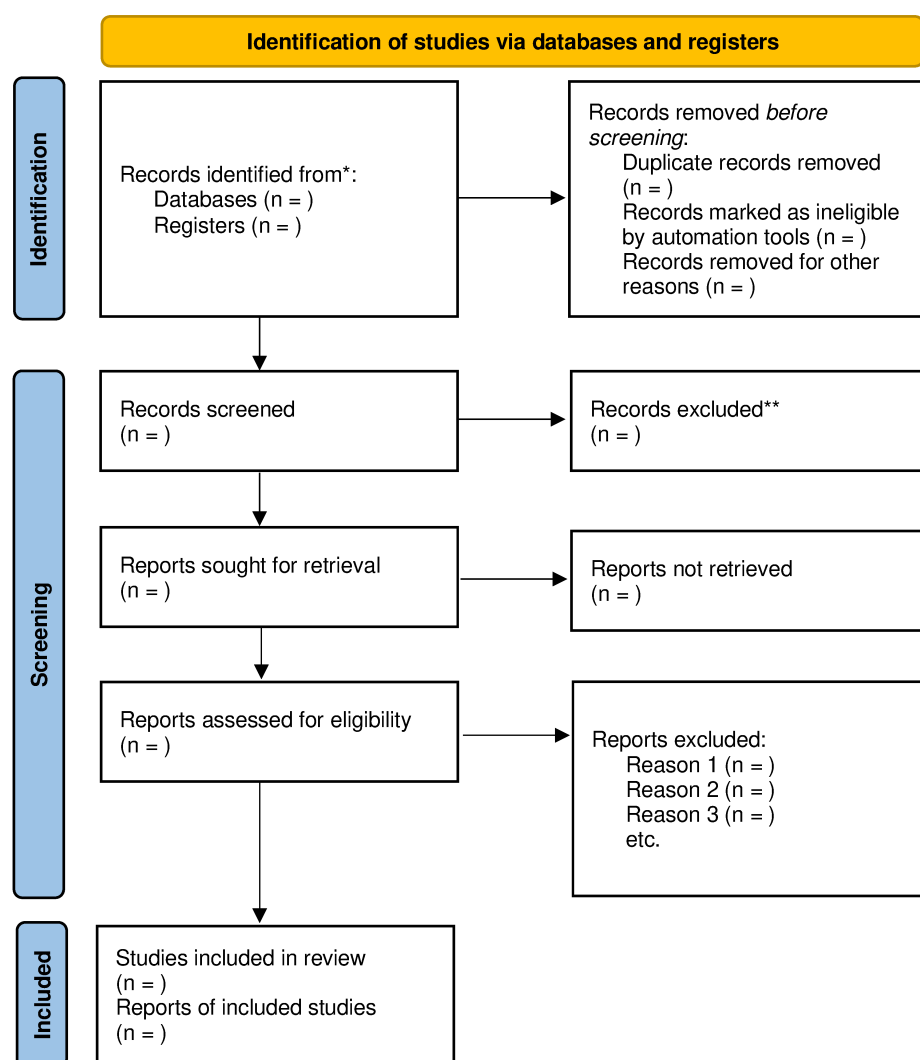
Number	Search terms
#1	SU='COVID-19'+ 'SARS-CoV-2'+ '冠状病毒'+ '严重急性呼吸综合征'+ '非典型肺炎'+ '2019 新型冠状病毒'+ '肺炎'+ '呼吸衰竭'
#2	SU='康复'+ '呼吸康复'+ '肺康复'+ '运动训练'+ '物理疗法'+ '中医康复'+ '太极拳'+ '八段锦'+ '六字诀'+ '传统功法'+ '冥想'+ '针刺'+ '艾灸'+ '灸法'+ '穴位敷贴'+ '推拿'+ '按摩'
#3	SU='指南'+ '专家共识'+ '专家意见'+ '指导意见'+ '建议'+ '方案'+ '标准'+ '规范'+ '推荐'+ '共识声明'
#4	#1 AND #2 AND #3
SU=主题	

### Search Strategy for NGC, GIN, SIGN, NICE and WHO

Number	Search terms
#1	COVID-19 OR COVID-19 pneumonia OR novel coronavirus OR novel coronavirus pneumonia OR coronaviru OR 2019-ncov OR 2019-ncov pneumonia OR novel cov OR severe acute respiratory syndrome cov2 OR SARS-CoV-2 OR severe acute respiratory disease
#2	rehabilitation OR respiratory rehabilitation OR pulmonary rehabilitation OR exercise therapy OR OR physiotherapy OR physical therapy OR traditional Chinese medicine rehabilitation
#3	#1 AND #2



## PRISMA 2020 flow diagram for new systematic reviews which included searches of databases and registers only



\*Consider, if feasible to do so, reporting the number of records identified from each database or register searched (rather than the total number across all databases/registers).

\*\*If automation tools were used, indicate how many records were excluded by a human and how many were excluded by automation tools.

From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ* 2021;372:n71. doi: 10.1136/bmj.n71

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