



Bilaga till rapport

1 (22)

Insatser vid postcovid och andra närliggande tillstånd och syndrom – en kartläggning

Treatment and rehabilitation interventions for post-COVID and other related conditions and syndromes – a systematic mapping of studies

Rapport 379 (2024)

Bilaga 5 Sammanställning av risk för bias

Studier med låg eller måttlig risk för bias har inkluderats i rapporten. Studier med hög risk för bias har exkluderats.

Innehåll

1. Postcovid	2
2. ME/CFS	7
3. PANS/PANDAS	8
4. Post-Sepsis.....	9
5. POTS	10
6. Referenser	11

1. Postcovid

Figur 1.1 Sammanställning av primärstudier med låg eller måttlig risk för bias [1-49].

	Risk of bias						
	D1	D2	D3	D4	D5	D6	Overall
Berenguel Senen 2024	-	-	-	+	-	+	-
Berube 2023	+	-	-	+	-	+	-
Calvo-Paniagua 2024	+	-	+	-	+	+	-
Capin 2022	+	-	-	+	+	+	-
Chen 2021	+	+	-	+	-	-	-
Chung 2023	+	+	+	+	+	+	+
DalNegro 2022	-	+	+	+	-	+	-
D'Ascanio 2021	-	-	+	+	-	+	-
DelCorral 2023	+	+	+	+	+	+	+
DiStadio 2023b	+	-	-	+	-	+	-
Elhamrawy 2023	+	+	+	+	+	+	+
Espinoza-Bravo 2023	+	+	+	+	+	+	+
Figueiredo 2024	+	+	✗	+	+	+	-
Finnigan 2023	+	+	+	+	+	-	+
Hansen 2023	+	+	+	+	+	+	+
Hosseinpour 2022	-	+	+	+	+	+	+
Ibrahim 2023	+	+	+	+	+	+	+
Jimeno-Almazan 2022	-	+	+	-	+	+	-
Jimeno-Almazan 2023	+	-	+	-	+	+	-
Kerget 2023	+	+	+	-	-	+	-
Kerling 2024	+	-	+	+	+	+	-
Klirova 2024	✗	+	+	+	+	+	-
Kogel 2023	+	-	+	-	+	+	-
Kuut 2023	+	-	+	-	+	+	-
Lasheen 2023	-	-	-	+	-	+	-
Lau 2024	+	+	+	-	-	-	-
Lerner 2023	+	-	+	+	-	+	-
Li 2022	+	-	-	-	-	+	-
Longobardi 2023	+	-	-	-	+	+	-
McGregor 2024	+	-	+	-	+	+	-
McIntyre 2023	+	+	-	+	+	+	-
McNarry 2021	+	-	-	-	-	+	-
Montazmanesh 2023	-	+	-	+	+	+	-
Navas-Otero 2024	-	-	+	-	-	+	-
Ogonowska-Słodownik 2023	-	✗	-	-	+	+	-
Ojeda 2024	+	-	+	-	+	+	-
Oliver-Mas 2023	+	+	+	+	-	+	-
Palau 2022	+	+	+	-	+	+	-
Pleguezuelos 2024	+	-	+	+	+	+	-
Rasmussen 2023	+	-	+	+	+	+	-
Romanet 2023	+	+	+	-	+	-	-
Samper-Pardo 2023	+	-	-	-	+	+	-
Sanchez-Mila 2023	+	-	+	+	-	+	-
Santana 2023	+	+	+	+	+	+	-
Schepens 2022	+	+	+	+	+	+	+
Shamohammadi 2022	+	+	-	+	+	+	+
Tosato 2022	-	-	+	+	+	+	-
Yan 2023	-	-	+	+	+	+	-
Zilberman-Itskovich 2022	+	+	+	+	+	+	+

D1: Bias arising from the randomization process
D2: Bias due to deviations from intended intervention
D3: Bias due to missing outcome data
D4: Bias in measurement of the outcomes
D5: Bias in selection of the reported results
D6: Conflict of interests

Judgement
✗ High
- Some concerns
+ Low

Figur 1.2 Sammanställning av primärstudier med hög risk för bias [50-82].

	Risk of bias						
	D1	D2	D3	D4	D5	D6	Overall
Abdelazim 2022a	+	+	+	+	×	+	×
Abdelazim 2022b	+	+	+	-	×	+	×
Abdelazim 2023	+	-	+	-	×	+	×
AboElNaga 2022	-	×	+	-	-	+	×
Alghitany 2023	×	×	+	×	-	+	×
Ali 2023	×	-	+	+	-	-	×
Altemani 2024	+	+	+	+	×	+	×
Aref 2022	+	-	×	×	+	+	×
Badran 2022	×	+	+	+	×	-	×
Banerjee 2022	×	-	-	-	-	+	×
Bileviciute-Ljungar 2024	+	-	×	×	×	+	×
Cardoso Soares 2023	×	-	-	-	-	+	×
deAraujoFurtado 2023	-	×	-	+	-	+	×
DellavechiadeCarvalho 2022	×	-	-	-	-	+	×
DeLuca 2022	×	×	×	×	×	+	×
Derksen 2023	×	-	×	×	-	-	×
DiStadio 2023a	×	+	×	+	+	+	×
Evman 2023	×	×	+	-	×	+	×
Gohil 2022	-	-	-	-	-	+	×
Hamed 2023	×	-	×	-	×	+	×
Imam 2023	+	+	+	+	×	+	×
Lechner 2022	×	×	×	-	+	+	×
Mahadev 2023	+	-	×	-	+	×	×
Nikrah 2023	×	×	×	×	-	+	×
Pooladgar 2023	-	×	+	-	-	+	×
Raof 2022	×	×	×	×	×	-	×
Saha 2024	+	-	+	-	+	-	×
Shatri 2023	×	×	+	×	+	+	×
Tanashyan 2023	×	-	+	-	-	×	×
Tanhan 2023	×	-	+	×	×	+	×
Toussaint 2023	×	×	×	×	-	×	×
Vallier 2023	-	-	+	-	-	+	×
Versace 2023	×	-	-	-	-	+	×

Study

D1: Bias arising from the randomization process
D2: Bias due to deviations from intended intervention
D3: Bias due to missing outcome data
D4: Bias in measurement of the outcomes
D5: Bias in selection of the reported results
D6: Conflict of interests

Judgement
 High
 Some concerns
 Low

De sammantagna risk för bias-bedömningarna för Chen 2021 [5], D'Ascanio 2021 [7] samt McNarry 2022 [32] kommer från den tidigare SBU-rapporten om behandling och rehabilitering av postcovid från 2022 [83].

Figur 1.3 Sammanställning av risk för bias i de systematiska översikterna [83-90].

	Risk of bias						Overall
	D1	D2	D3	D4	D5	D6	
Calvache-Mateo 2023							
Chen 2022							
Estebanez-Pérez 2023							
Fox 2023							
Lewthwaite 2023							
Pouliopoulou 2023							
SBU 2022							
Wang 2023							

Study

D1: Study eligibility criteria
D2: Identification and selection of studies
D3: Data collection and study appraisal
D4: Synthesis and findings
D5: Conflict of interest
D6: Conclusions supported by evidence

Judgement
 High
 Low
 Not applicable

Systematiska översikter bedömdes med hjälp av en svensk översättning av Cochranes granskningsmall ROBIS [91]. Om översikten bedömdes ha hög risk för bias i en domän granskades den inte vidare enligt de efterföljande domänerna utan bedömdes ha hög risk för bias och exkluderades.

2. ME/CFS

Figur 2.1 Sammanställning av risk för bias för primärstudierna [92-97].

Study	Risk of bias						Overall
	D1	D2	D3	D4	D5	D6	
Fluge 2019							
Gotaas 2021							
Joseph 2022							
Nilsson 2017							
Pinxsterhius 2017							
Witham 2015							

D1: Bias arising from the randomization process
 D2: Bias due to deviations from intended intervention
 D3: Bias due to missing outcome data
 D4: Bias in measurement of the outcomes
 D5: Bias in selection of the reported results
 D6: Conflict of interests

Judgement
 Some concerns
 Low
 Not applicable

De sammantagna risk för bias-bedömningarna för Nilsson 2017 [95], Pinxsterhius 2017 [96] samt Witham 2015 [97] kommer från den tidigare SBU-rapporten om ME/CFS från 2018 [98].

Figur 2.2 Sammanställning av risk för bias för systematisk översikt [99].

Study	Risk of bias						Overall
	D1	D2	D3	D4	D5	D6	
Wormgoor 2021							

D1: Study eligibility criteria
 D2: Identification and selection of studies
 D3: Data collection and study appraisal
 D4: Synthesis and findings
 D5: Conflict of interest
 D6: Conclusions supported by evidence

Judgement
 High
 Some concerns
 Low

3. PANS/PANDAS

Figur 3.1 Sammanställning av risk för bias i primärstudierna [100-105].

		Risk of bias						
		D1	D2	D3	D4	D5	D6	Overall
Study	Perlmutter 1999	⊖	⊖	⊖	⊖	⊖	⊖	⊖
	Williams 2016	⊕	⊕	⊕	⊕	⊕	⊕	⊕
	Garvey 1999	⊕	⊕	⊖	⊖	⊖	⊖	⊖
	Murphy 2017	⊕	⊕	⊕	⊕	⊕	⊕	⊕
	Murphy 2015	⊕	⊖	⊕	⊕	⊖	⊖	⊖
	Snider 2005	⊖	⊕	⊕	⊕	⊖	⊖	⊖

D1: Bias arising from the randomization process

D2: Bias due to deviations from intended intervention

D3: Bias due to missing outcome data

D4: Bias in measurement of the outcomes

D5: Bias in selection of the reported results

D6: Conflict of interests

Judgement

⊖ Some concerns

⊕ Low

Figur 3.2 Sammanställning av risk för bias i de systematiska översikterna [106-111].

		Risk of bias						
		D1	D2	D3	D4	D5	D6	Overall
Study	Burchi 2028							
	Cocuzza 2022							
	Farhood 2016							
	Frønsdal 2021							
	Johnson 2021							
	Sigra 2018							
		D1: Study eligibility criteria D2: Identification and selection of studies D3: Data collection and study appraisal D4: Synthesis and findings D5: Conflict of interest D6: Conclusions supported by evidence						Judgement High Some concerns Low

4. Post-Sepsis

Figur 4.1 Sammanställning av risk för bias i primärstudierna [112, 113].

		Risk of bias						
		D1	D2	D3	D4	D5	D6	Overall
Study	Gawlytta 2022							
	Schmidt 2016							

D1: Bias arising from the randomization process

D2: Bias due to deviations from intended intervention

D3: Bias due to missing outcome data

D4: Bias in measurement of the outcomes

D5: Bias in selection of the reported results

D6: Conflict of interests

Judgement

Some concerns

Low

5. POTS

Figur 5.1 Sammanställning av risk för bias i primärstudierna [114-126].

	Risk of bias						Overall
	D1	D2	D3	D4	D5	D6	
Study							
Arnold 2013	+	+	+	+	+	-	-
Bourne 2021	-	-	+	-	-	-	-
Coffin 2012	-	+	-	+	+	+	-
Gamboa 2015	-	-	-	+	+	+	-
Green 2014	+	-	+	+	-	+	-
Kpaeyeh 2014	-	-	-	+	+	+	-
Mar 2014	-	+	+	+	+	+	-
Moon 2018	-	-	-	-	-	+	-
Raj 2005	-	-	-	-	-	+	-
Smith 2020	+	-	+	-	-	-	-
Taub 2021	+	+	-	+	+	-	-
Wheatley-Guy 2023	-	-	-	-	-	+	-

D1: Bias arising from the randomization process
 D2: Bias due to deviations from intended intervention
 D3: Bias due to missing outcome data
 D4: Bias in measurement of the outcomes
 D5: Bias in selection of the reported results
 D6: Conflict of interests

Judgement
 - Some concerns
 + Low

Figur 5.2 Sammanställning av risk för bias i de systematiska översikterna [127-130].

	Risk of bias						Overall
	D1	D2	D3	D4	D5	D6	
Study							
Deng 2019	+	X	○	○	○	○	X
Hasan 2020	+	X	○	○	○	○	X
Vasavada 2023	+	X	○	○	○	○	X
Wells 2018	+	X	○	○	○	○	X

D1: Study eligibility criteria
 D2: Identification and selection of studies
 D3: Data collection and study appraisal
 D4: Synthesis and findings
 D5: Conflict of interest
 D6: Conclusions supported by evidence

Judgement
 X High
 + Low
 ○ Not applicable

Figurerna är gjorda i visualiseringsverktyget robvis [131].

6. Referenser

1. Berenguel Senen A, Gadella Fernandez A, Godoy Lopez J, Borrego Rodriguez J, Gallango Brejano M, Cepas Guillen P, et al. Functional rehabilitation based on therapeutic exercise training in patients with postacute COVID syndrome (RECOVER). *Rev Esp Cardiol (Engl)*. 2024;77(2):167-75. Available from: <https://doi.org/10.1016/j.rec.2023.06.016>.
2. Berube S, Demers C, Bussiere N, Cloutier F, Pek V, Chen A, et al. Olfactory Training Impacts Olfactory Dysfunction Induced by COVID-19: A Pilot Study. *ORL J Otorhinolaryngol Relat Spec*. 2023;85(2):57-66. Available from: <https://doi.org/10.1159/000528188>.
3. Calvo-Paniagua J, Diaz-Arribas MJ, Valera-Calero JA, Ramos-Sanchez M, Fernandez-de-Las-Penas C, Navarro-Santana MJ, et al. An Educational, Exercise and Occupational Therapy-Based Telerehabilitation Program versus 'Wait-and-See' for Improving Self-Perceived Exertion in Patients with post-COVID Fatigue and Dyspnea: A Randomized Clinical Trial. *Am J Phys Med Rehabil*. 2024;31:31. Available from: <https://doi.org/10.1097/PHM.0000000000002441>.
4. Capin JJ, Jolley SE, Morrow M, Connors M, Hare K, Mawhinney S, et al. Safety, feasibility and initial efficacy of an app-facilitated telerehabilitation (AFTER) programme for COVID-19 survivors: A pilot randomised study. *BMJ Open*. 2022;12(7). Available from: <https://doi.org/10.1136/bmjopen-2022-061285>.
5. Chen Y LC, Wang T, Qi J, Jia X, Zeng X, et al. Efficacy and safety of Bufei Huoxue capsules in the management of convalescent patients with COVID-19 infection: A multicentre, double-blind, and randomised controlled trial. *J Ethnopharmacol*. 2021;114830. Available from: <https://doi.org/https://doi.org/10.1016/j.jep.2021.114830>.
6. Chung TW-H, Zhang H, Wong FK-C, Sridhar S, Lee TM-C, Leung GK-K, et al. A Pilot Study of Short-Course Oral Vitamin A and Aerosolised Diffuser Olfactory Training for the Treatment of Smell Loss in Long COVID. *Brain Sciences*. 2023;13(7):1014.
7. D'Ascanio L VF, Cingolani C, Maranzano M, Brenner MJ, Di Stadio A. Randomized clinical trial "olfactory dysfunction after COVID-19: olfactory rehabilitation therapy vs. intervention treatment with Palmitoylethanolamide and Luteolin": preliminary results. *Eur Rev Med Pharmacol Sci*. 2021;25(11):4156-62. Available from: https://doi.org/https://doi.org/10.26355/eurev_202106_26059.
8. Dal Negro RW, Turco P, Povero M. Nebivolol: an effective option against long-lasting dyspnoea following COVID-19 pneumonia - a pivotal double-blind, cross-over controlled study. *Multidiscip*. 2022;17:886. Available from: <https://doi.org/10.4081/mrm.2022.886>.
9. Del Corral T, Fabero-Garrido R, Plaza-Manzano G, Fernandez-de-Las-Penas C, Navarro-Santana M, Lopez-de-Uralde-Villanueva I. Home-based respiratory muscle training on quality of life and exercise tolerance in long-term post-COVID-19: Randomized controlled trial. *Ann Phys Rehabil Med*. 2023;66(1):101709. Available from: <https://doi.org/10.1016/j.rehab.2022.101709>.
10. Di Stadio A, Gallina S, Cocuzza S, De Luca P, Ingrassia A, Oliva S, et al. Treatment of COVID-19 olfactory dysfunction with olfactory training, palmitoylethanolamide with

- luteolin, or combined therapy: a blinded controlled multicenter randomized trial. *European Archives of Oto-Rhino-Laryngology*. 2023;280(11):4949-61. Available from: <https://doi.org/10.1007/s00405-023-08085-8>.
11. Elhamrawy MY, Mohammad El Sherbini AEHIES, Mokhtar MM, Mashaal A, Elkady SM, Elsadany SM, et al. Effect of Tai Chi versus Aerobic Training on Improving Hand Grip Strength, Fatigue, and Functional Performance in Older Adults Post-COVID-19: a randomized controlled trial. *Journal of Population Therapeutics and Clinical Pharmacology*. 2023;30(7):e190-e8. Available from: <https://doi.org/10.47750/jptcp.2023.30.07.024>.
 12. Espinoza-Bravo C, Arnal-Gomez A, Martinez-Arnau FM, Nunez-Cortes R, Hernandez-Guillen D, Flor-Rufino C, et al. Effectiveness of Functional or Aerobic Exercise Combined With Breathing Techniques in Telerehabilitation for Patients With Long COVID: A Randomized Controlled Trial. *Phys Ther*. 2023;103(11):04. Available from: <https://doi.org/10.1093/ptj/pzad118>.
 13. Figueiredo LP, Paim P, Cerqueira-Silva T, Barreto CC, Lessa MM. Alpha-lipoic acid does not improve olfactory training results in olfactory loss due to COVID-19: a double-blind randomized trial. *Rev Bras Otorrinolaringol (Engl Ed)*. 2024;90(1):101356. Available from: <https://doi.org/10.1016/j.bjorl.2023.101356>.
 14. Finnigan LEM, Cassar MP, Koziel MJ, Pradines J, Lamlum H, Azer K, et al. Efficacy and tolerability of an endogenous metabolic modulator (AXA1125) in fatigue-predominant long COVID: a single-centre, double-blind, randomised controlled phase 2a pilot study. *EClinicalMedicine*. 2023;59:101946. Available from: <https://doi.org/10.1016/j.eclinm.2023.101946>.
 15. Hansen KS, Mogensen TH, Agergaard J, Schiottz-Christensen B, Ostergaard L, Vibholm LK, et al. High-dose coenzyme Q10 therapy versus placebo in patients with post COVID-19 condition: a randomized, phase 2, crossover trial. *Lancet Reg Health Eur*. 2023;24:100539. Available from: <https://doi.org/10.1016/j.lanepe.2022.100539>.
 16. Hosseinpour M, Kabiri M, Rajati Haghi M, Ghadam Soltani T, Rezaei A, Faghfour A, et al. Intranasal Corticosteroid Treatment on Recovery of Long-Term Olfactory Dysfunction Due to COVID-19. *Laryngoscope*. 2022;132(11):2209-16. Available from: <https://doi.org/10.1002/lary.30353>.
 17. Ibrahim AA, Hussein HM, Ali MS, Kanwal R, Acar T, Shaik DH, et al. A randomized controlled trial examining the impact of low vs. moderate-intensity aerobic training in post-discharge COVID-19 older subjects. *Eur Rev Med Pharmacol Sci*. 2023;27(9):4280-91. Available from: https://doi.org/10.26355/eurrev_202305_32338.
 18. Jimeno-Almazan A, Buendia-Romero A, Martinez-Cava A, Franco-Lopez F, Sanchez-Alcaraz BJ, Courel-Ibanez J, et al. Effects of a concurrent training, respiratory muscle exercise, and self-management recommendations on recovery from post-COVID-19 conditions: the RECOVE trial. *J Appl Physiol*. 2023;134(1):95-104. Available from: <https://doi.org/10.1152/jappphysiol.00489.2022>.
 19. Jimeno-Almazan A, Franco-Lopez F, Buendia-Romero A, Martinez-Cava A, Sanchez-Agar JA, Sanchez-Alcaraz Martinez BJ, et al. Rehabilitation for post-COVID-19 condition through a supervised exercise intervention: A randomized controlled trial. *Scand J Med Sci Sports*. 2022;32(12):1791-801. Available from: <https://doi.org/10.1111/sms.14240>.

20. Kerget B, Cil G, Araz O, Alper F, Akgun M. Comparison of two antifibrotic treatments for lung fibrosis in post-COVID-19 syndrome: A randomized, prospective study. *Med Clin (Barc)*. 2023;160(12):525-30. Available from: <https://doi.org/10.1016/j.medcli.2022.12.021>.
21. Kerling A, Beyer S, Dirks M, Scharbau M, Hennemann A-K, Dopfer-Jablonka A, et al. Effects of a randomized-controlled and online-supported physical activity intervention on exercise capacity, fatigue and health related quality of life in patients with post-COVID-19 syndrome. *BMC Sports Science, Medicine and Rehabilitation*. 2024;16(1):33. Available from: <https://doi.org/10.1186/s13102-024-00817-5>.
22. Klírová M, Adamová A, Biačková N, Laskov O, Renková V, Stuchlíková Z, et al. Transcranial direct current stimulation (tDCS) in the treatment of neuropsychiatric symptoms of long COVID. *Sci*. 2024;14(1):2193. Available from: <https://doi.org/10.1038/s41598-024-52763-4>.
23. Kogel A, Machatschek M, Scharschmidt R, Wollny C, Lordick F, Ghanem M, et al. Physical exercise as a treatment for persisting symptoms post-COVID infection: review of ongoing studies and prospective randomized controlled training study. *Clinical Research in Cardiology*. 2023;112(11):1699-709. Available from: <https://doi.org/10.1007/s00392-023-02300-6>.
24. Kuut TA, Muller F, Csorba I, Braamse A, Aldenkamp A, Appelman B, et al. Efficacy of cognitive behavioral therapy targeting severe fatigue following COVID-19: results of a randomized controlled trial. *Clin Infect Dis*. 2023;08:08. Available from: <https://doi.org/10.1093/cid/ciad257>.
25. Lasheen H, Abou-Zeid MA. Olfactory mucosa steroid injection in treatment of post-COVID-19 olfactory dysfunction: a randomized control trial. *The Egyptian Journal of Otolaryngology*. 2023;39(1):118. Available from: <https://doi.org/10.1186/s43163-023-00478-0>.
26. Lau RI, Su Q, Lau ISF, Ching JYL, Wong MCS, Lau LHS, et al. A synbiotic preparation (SIM01) for post-acute COVID-19 syndrome in Hong Kong (RECOVERY): a randomised, double-blind, placebo-controlled trial. *The Lancet Infectious Diseases*. 2024;24(3):256-65. Available from: [https://doi.org/https://doi.org/10.1016/S1473-3099\(23\)00685-0](https://doi.org/https://doi.org/10.1016/S1473-3099(23)00685-0).
27. Lerner DK, Garvey KL, Arrighi-Allisan A, Kominsky E, Filimonov A, Al-Awady A, et al. Omega-3 Fatty Acid Supplementation for the Treatment of Persistent COVID-Related Olfactory Dysfunction. *Am J Rhinol Allergy*. 2023;19458924231174799. Available from: <https://doi.org/10.1177/19458924231174799>.
28. Li J, an, Xia W, Zhan C, Liu S, Yin Z, et al. A telerehabilitation programme in post-discharge COVID-19 patients (TERECO): a randomised controlled trial. *Thorax*. 2022;77(7):697. Available from: <https://doi.org/10.1136/thoraxjnl-2021-217382>.
29. Longobardi I, Goessler K, de Oliveira Junior GN, Prado D, Santos JVP, Meletti MM, et al. Effects of a 16-week home-based exercise training programme on health-related quality of life, functional capacity, and persistent symptoms in survivors of severe/critical COVID-19: a randomised controlled trial. *BJSM online*. 2023;10:10. Available from: <https://doi.org/10.1136/bjsports-2022-106681>.
30. McGregor G, Sandhu H, Bruce J, Sheehan B, McWilliams D, Yeung J, et al. Clinical effectiveness of an online supervised group physical and mental health rehabilitation

- programme for adults with post-covid-19 condition (REGAIN study): multicentre randomised controlled trial. *Bmj*. 2024;384:e076506. Available from: <https://doi.org/10.1136/bmj-2023-076506>.
31. McIntyre RS, Phan L, Kwan ATH, Mansur RB, Rosenblat JD, Guo Z, et al. Vortioxetine for the treatment of post-COVID-19 condition: a randomized controlled trial. *Brain*. 2023;147(3):849-57. Available from: <https://doi.org/10.1093/brain/awad377>.
 32. McNarry MA BR, Shelley J, Hudson J, Saynor ZL, Duckers J, et al. Inspiratory Muscle Training Enhances Recovery Post COVID-19: A Randomised Controlled Trial. *The European respiratory journal*. 2022. Available from: <https://doi.org/https://doi.org/10.1183/13993003.03101-2021>.
 33. Momtazmanesh S, Ansari S, Izadi Z, Shobeiri P, Vatankhah V, Seifi A, et al. Effect of famotidine on cognitive and behavioral dysfunctions induced in post-COVID-19 infection: A randomized, double-blind, and placebo-controlled study. *J Psychosom Res*. 2023;172:111389. Available from: <https://doi.org/10.1016/j.jpsychores.2023.111389>.
 34. Navas-Otero A, Calvache-Mateo A, Calles-Plata I, Valenza-Peña G, Hernández-Hernández S, Ortiz-Rubio A, et al. A lifestyle adjustments program in long COVID-19 improves symptomatic severity and quality of life. A randomized control trial. *Patient Education and Counseling*. 2024;122:108180. Available from: <https://doi.org/https://doi.org/10.1016/j.pec.2024.108180>.
 35. Ogonowska-Slodownik A, Labecka MK, Maciejewska-Skrendo A, McNamara RJ, Kaczmarczyk K, Starczewski M, et al. Effect of Water-Based vs. Land-Based Exercise Intervention (postCOVIDkids) on Exercise Capacity, Fatigue, and Quality of Life in Children with Post COVID-19 Condition: A Randomized Controlled Trial. *Journal of Clinical Medicine*. 2023;12(19):6244.
 36. Ojeda A, Calvo A, Cuñat T, Mellado-Artigas R, Costas-Carrera A, Sánchez-Rodríguez MM, et al. Effectiveness of a specific follow up program for the management of the mental components of post-intensive care syndrome and chronic pain after COVID-19: results from the PAIN-COVID randomized clinical trial. *Revista Española de Anestesiología y Reanimación (English Edition)*. 2024;71(5):349-59. Available from: <https://doi.org/https://doi.org/10.1016/j.redare.2023.12.009>.
 37. Oliver-Mas S, Delgado-Alonso C, Delgado-Álvarez A, Díez-Cirarda M, Cuevas C, Fernández-Romero L, et al. Transcranial direct current stimulation for post-COVID fatigue: A randomized, double-blind, controlled pilot study. *Brain Communications*. 2023;5(2). Available from: <https://doi.org/10.1093/braincomms/fcad117>.
 38. Palau P, Dominguez E, Gonzalez C, Bondia E, Albiach C, Sastre C, et al. Effect of a home-based inspiratory muscle training programme on functional capacity in postdischarged patients with long COVID: the InsCOVID trial. *BMJ Open Respir Res*. 2022;9(1):12. Available from: <https://doi.org/10.1136/bmjresp-2022-001439>.
 39. Pleguezuelos E, Del Carmen A, Moreno E, Miravittles M, Serra M, Garnacho-Castaño MV. Effects of a telerehabilitation program and detraining on cardiorespiratory fitness in patients with post-COVID-19 sequelae: A randomized controlled trial. *Scandinavian Journal of Medicine & Science in Sports*. 2024;34(1):e14543. Available from: <https://doi.org/https://doi.org/10.1111/sms.14543>.
 40. Rasmussen IE, Løk M, Durrer CG, Foged F, Schelde VG, Budde JB, et al. Impact of high-intensity interval training on cardiac structure and function after COVID-19: an

- investigator-blinded randomized controlled trial. *Journal of Applied Physiology*. 2023;135(2):421-35. Available from: <https://doi.org/10.1152/jappphysiol.00078.2023>.
41. Romanet C, Wormser J, Fels A, Lucas P, Prudat C, Sacco E, et al. Effectiveness of exercise training on the dyspnoea of individuals with long COVID: A randomised controlled multicentre trial. *Ann Phys Rehabil Med*. 2023;66(5):101765. Available from: <https://doi.org/10.1016/j.rehab.2023.101765>.
 42. Samper-Pardo M, León-Herrera S, Oliván-Blázquez B, Méndez-López F, Domínguez-García M, Sánchez-Recio R. Effectiveness of a telerehabilitation intervention using ReCOVery APP of long COVID patients: a randomized, 3-month follow-up clinical trial. *Sci Rep*. 2023;13(1):7943. Available from: <https://doi.org/10.1038/s41598-023-35058-y>.
 43. Sánchez-Milá Z, Abuín-Porras V, Romero-Morales C, Almazán-Polo J, Velázquez Saornil J. Effectiveness of a respiratory rehabilitation program including an inspiration training device versus traditional respiratory rehabilitation: a randomized controlled trial. *PeerJ*. 2023;11:e16360. Available from: <https://doi.org/10.7717/peerj.16360>.
 44. Santana K, Franca E, Sato J, Silva A, Queiroz M, de Farias J, et al. Non-invasive brain stimulation for fatigue in post-acute sequelae of SARS-CoV-2 (PASC). *Brain Stimul*. 2023;16(1):100-7. Available from: <https://doi.org/10.1016/j.brs.2023.01.1672>.
 45. Schepens EJA, Blijleven EE, Boek WM, Boesveldt S, Stokroos RJ, Stegeman I, et al. Prednisolone does not improve olfactory function after COVID-19: a randomized, double-blind, placebo-controlled trial. *BMC Med*. 2022;20(1):445. Available from: <https://doi.org/10.1186/s12916-022-02625-5>.
 46. Shamohammadi I, Kazemeyni S, Sadighi M, Hasanzadeh T, Dizavi A. Efficacy of tadalafil on improvement of men with erectile dysfunction caused by COVID-19: A randomized placebo-controlled trial. *Asian J Urol*. 2022;13:13. Available from: <https://doi.org/10.1016/j.ajur.2022.05.006>.
 47. Tosato M, Calvani R, Picca A, Ciciarello F, Galluzzo V, Coelho-Junior HJ, et al. Effects of L-Arginine Plus Vitamin C Supplementation on Physical Performance, Endothelial Function, and Persistent Fatigue in Adults with Long COVID: A Single-Blind Randomized Controlled Trial. *Nutrients*. 2022;14(23):23. Available from: <https://doi.org/10.3390/nu14234984>.
 48. Yan CH, Jang SS, Lin HC, Ma Y, Khanwalkar AR, Thai A, et al. Use of platelet-rich plasma for COVID-19-related olfactory loss: a randomized controlled trial. *Int Forum Allergy Rhinol*. 2023;13(6):989-97. Available from: <https://doi.org/10.1002/alr.23116>.
 49. Zilberman-Itskovich S, Catalogna M, Sasson E, Elman-Shina K, Hadanny A, Lang E, et al. Hyperbaric oxygen therapy improves neurocognitive functions and symptoms of post-COVID condition: randomized controlled trial. *Sci*. 2022;12(1):11252. Available from: <https://doi.org/10.1038/s41598-022-15565-0>.
 50. Abdelazim MH, Abdelazim AH. Effect of Sodium Gluconate on Decreasing Elevated Nasal Calcium and Improving Olfactory Function Post COVID-19 Infection. *Am J Rhinol Allergy*. 2022;36(6):841-8. Available from: <https://doi.org/10.1177/19458924221120116>.
 51. Abdelazim MH, Abdelazim AH, Moneir W. The effect of intra-nasal tetra sodium pyrophosphate on decreasing elevated nasal calcium and improving olfactory function post COVID-19: a randomized controlled trial. *Allergy Asthma Clin Immunol*. 2022;18(1):67. Available from: <https://doi.org/10.1186/s13223-022-00711-0>.

52. Abdelazim MH, Mandour Z, Abdelazim AH, Ismaiel WF, Gamal M, Abourehab MAS, et al. Intra Nasal Use of Ethylene Diamine Tetra Acetic Acid for Improving Olfactory Dysfunction Post COVID-19. *Am J Rhinol Allergy*. 2023;37(6):630-7. Available from: <https://doi.org/10.1177/19458924231184055>.
53. Abo El Naga HA, El Zaiat RS, Hamdan AM. The potential therapeutic effect of platelet-rich plasma in the treatment of post-COVID-19 parosmia. *Egyptian Journal of Otolaryngology*. 2022;38(1). Available from: <https://doi.org/10.1186/s43163-022-00320-z>.
54. Alghitany SI, Fouad SA, Nassif AA, Guirguis SA. The effect of laser acupuncture on immunomodulation and dyspnea in post-COVID-19 patients. *Advances in Rehabilitation*. 2023;37(1):33-9. Available from: <https://doi.org/10.5114/arch.2023.125836>.
55. Ali AA, Elnahas NG, Algazzar SA, Lotfy AWM, Taha EM. Impact of Active Cycle of Breathing Technique on Selected Pulmonary Outcomes in Post-COVID Syndrome Patients. *Journal of Pharmaceutical Negative Results*. 2023;14:710-7. Available from: <https://doi.org/10.47750/pnr.2023.14.S02.87>.
56. Altemani AH, Alanazi MA, Alharbi A, Alsahali S, Alotaib NM, Abdelazim MH. The Efficacy of Sodium Phytate as a Natural Chelating Agent in Reducing Elevated Calcium Levels in Nasal Mucus Among Individuals Experiencing Olfactory Dysfunction Following COVID-19: A Prospective Randomized Double-Controlled Clinical Trial. *American Journal of Rhinology and Allergy*. 2024;38(2):116-22. Available from: <https://doi.org/10.1177/19458924231220545>.
57. Aref ZF, Bazeed S, Hassan MH, Hassan AS, Ghweil AA, Sayed MAA, et al. Possible Role of Ivermectin Mucoadhesive Nanosuspension Nasal Spray in Recovery of Post-COVID-19 Anosmia. *Infect*. 2022;15:5483-94. Available from: <https://doi.org/10.2147/IDR.S381715>.
58. Badran BW, Huffman SM, Dancy M, Austelle CW, Bikson M, Kautz SA, et al. A pilot randomized controlled trial of supervised, at-home, self-administered transcutaneous auricular vagus nerve stimulation (taVNS) to manage long COVID symptoms. *Bioelectron*. 2022;8(1):13. Available from: <https://doi.org/10.1186/s42234-022-00094-y>.
59. Banerjee T, Das M, Mitra K. The effect of Pirfenidone on pulmonary function parameters in post recovery COVID-19 patients with pulmonary fibrosis compared to placebo in a Government Medical College, West Bengal. *Biomedicine (India)*. 2022;42(5):1005-7. Available from: <https://doi.org/10.51248/v42i5.1996>.
60. Bileviciute-Ljungar I, Norrefalk JR, Borg K. Improvements in functioning and activity according to ICF after 8-week multidisciplinary telerehabilitation for postcovid-19 condition – a randomized control study. *Journal of the neurological sciences*. 2023;455. Available from: <https://doi.org/10.1016/j.jns.2023.122148>.
61. Cardoso Soares P, de Freitas PM, Eduardo CP, Azevedo LH. Photobiomodulation, Transmucosal Laser Irradiation of Blood, or B complex as alternatives to treat Covid-19 Related Long-Term Taste Impairment: double-blind randomized clinical trial. *Lasers Med Sci*. 2023;38(1):261. Available from: <https://doi.org/10.1007/s10103-023-03917-9>.
62. de Araújo Furtado PL, Brasileiro-Santos MDS, de Mello BLC, Araújo AA, da Silva MAS, Suassuna JA, et al. The Effect of Telerehabilitation on Physical Fitness and Depression/Anxiety in Post-COVID-19 Patients: A Randomized Controlled Trial.

- International Journal of Telerehabilitation. 2023;15(1):1-11. Available from: <https://doi.org/10.5195/ijt.2023.6560>.
63. De Luca P, Camaioni A, Marra P, Salzano G, Carriere G, Ricciardi L, et al. Effect of Ultra-Micronized Palmitoylethanolamide and Luteolin on Olfaction and Memory in Patients with Long COVID: Results of a Longitudinal Study. *Cells*. 2022;11(16):17. Available from: <https://doi.org/10.3390/cells11162552>.
 64. Dellavechia de Carvalho C, Bertucci DR, Ribeiro FA, Costa GP, Toro DM, Camacho-Cardenosa M, et al. Effects of Moderate-Intensity Training Under Cyclic Hypoxia on Cardiorespiratory Fitness and Hematological Parameters in People Recovered From COVID-19: The Aerobicovid Study. *Sports health*. 2022;19417381221120639. Available from: <https://doi.org/10.1177/19417381221120639>.
 65. Derksen C, Rinn R, Gao L, Dahmen A, Cordes C, Kolb C, et al. Longitudinal Evaluation of an Integrated Post-COVID-19/Long COVID Management Program Consisting of Digital Interventions and Personal Support: Randomized Controlled Trial. *J Med Internet Res*. 2023;25:e49342. Available from: <https://doi.org/10.2196/49342>.
 66. Di Stadio A, Cantone E, De Luca P, Di Nola C, Massimilla EA, Motta G, et al. Parosmia COVID-19 Related Treated by a Combination of Olfactory Training and Ultramicrozonized PEA-LUT: A Prospective Randomized Controlled Trial. *Biomedicines*. 2023;11(4):06. Available from: <https://doi.org/10.3390/biomedicines11041109>.
 67. Evman MD, Cetin ZE. Effectiveness of platelet-rich plasma on post-COVID chronic olfactory dysfunction. *Revista da Associação Médica Brasileira*. 2023;69.
 68. Gohil D, Shaji M, Baxi G, Palekar T. Role of proprioceptive neuromuscular facilitation exercises in post-COVID individuals: A randomized-control trial. *Journal of the Scientific Society*. 2022;49(3):277-83. Available from: https://doi.org/10.4103/jss.jss_73_22.
 69. Hamed SA, Ahmed MAA-R. The effectiveness of cerebrolysin, a multi-modal neurotrophic factor, for treatment of post-covid-19 persistent olfactory, gustatory and trigeminal chemosensory dysfunctions: a randomized clinical trial. *Expert Review of Clinical Pharmacology*. 2023;16(12):1261-76. Available from: <https://doi.org/10.1080/17512433.2023.2282715>.
 70. Imam MS, Abdelazim MH, Abdelazim AH, Ismaiel WF, Gamal M, Abourehab MAS, et al. Efficacy of pentasodium diethylenetriamine pentaacetate in ameliorating anosmia post COVID-19. *Am J Otolaryngol*. 2023;44(4):103871. Available from: <https://doi.org/10.1016/j.amjoto.2023.103871>.
 71. Lechner M, Liu J, Counsell N, Gillespie D, Chandrasekharan D, Ta NH, et al. The COVANOS trial - insight into post-COVID olfactory dysfunction and the role of smell training. *Rhinology*. 2022;60(3):188-99. Available from: <https://doi.org/10.4193/Rhin21.470>.
 72. Mahadev A, Hentati F, Miller B, Bao J, Perrin A, Kallogjeri D, et al. Efficacy of Gabapentin For Post-COVID-19 Olfactory Dysfunction: The GRACE Randomized Clinical Trial. *JAMA Otolaryngology-Head & Neck Surgery*. 2023;149(12):1111-9. Available from: <https://doi.org/10.1001/jamaoto.2023.2958>.
 73. Nikrah N, Bahari F, Shiri A. Effectiveness of the acceptance and commitment therapy on resilience and quality of life in patients with post-acute COVID-19 syndrome. *Applied Nursing Research*. 2023;73:151723. Available from: <https://doi.org/https://doi.org/10.1016/j.apnr.2023.151723>.

74. Pooladgar P, Sakhabakhsh M, Soleiman-Meigooni S, Taghva A, Nasiri M, Darazam IA. The effect of donepezil hydrochloride on post-COVID memory impairment: A randomized controlled trial. *Journal of Clinical Neuroscience*. 2023;118:168-74. Available from: <https://doi.org/https://doi.org/10.1016/j.jocn.2023.09.005>.
75. Raoof A, Asif Shaik M, Mohammed SS, Chormalle R, Ansari A, Praneeth M. COMPARISON OF THE EFFICACY OF β BLOCKER AND IVABRADINE IN POST COVID-19 ASSOCIATED INAPPROPRIATE SINUS TACHYCARDIA. *Journal of Cardiovascular Disease Research*. 2022;13(4):57-63. Available from: <https://doi.org/10.31838/jcdr.2022.13.04.8>.
76. Saha S, Singh R, Mani I, Chakraborty K, Sarkar P, Saha S, et al. Individualized Homeopathic Medicines in the Treatment of Post-COVID-19 Fatigue in Adults: Single-Blind, Randomized, Placebo-Controlled Trial. *Complementary Medicine Research*. 2023;31(1):1-9. Available from: <https://doi.org/10.1159/000535279>.
77. Shatri H, Sinulingga DI, Rumende CM, Setiati S, Putranto R, Ginanjar E, et al. Effectiveness of Internet-Based Group Supportive Psychotherapy on Psychic and Somatic Symptoms, Neutrophil-Lymphocyte Ratio, and Heart Rate Variability in Post COVID-19 Syndrome Patients. *Acta med*. 2023;55(4):411-20.
78. Tanashyan M, Morozova S, Raskurazhev A, Kuznetsova P. A prospective randomized, double-blind placebo-controlled study to evaluate the effectiveness of neuroprotective therapy using functional brain MRI in patients with post-covid chronic fatigue syndrome. *Biomedicine & Pharmacotherapy*. 2023;168:115723. Available from: <https://doi.org/https://doi.org/10.1016/j.biopha.2023.115723>.
79. Tanhan A, Ozer AY, Timurtas E, Batirel A, Polat MG. Is asynchronous telerehabilitation equal to synchronous telerehabilitation in COVID-19 survivors with classes 4–6? *Journal of Telemedicine and Telecare*. 0(0):1357633X231189761. Available from: <https://doi.org/10.1177/1357633x231189761>.
80. Toussaint LL, Bratty AJ. Amygdala and Insula Retraining (AIR) Significantly Reduces Fatigue and Increases Energy in People with Long COVID. *Evidence-Based Complementary and Alternative Medicine*. 2023;2023(1):7068326. Available from: <https://doi.org/https://doi.org/10.1155/2023/7068326>.
81. Vallier JM, Simon C, Bronstein A, Dumont M, Jobic A, Paleiron N, et al. Randomized controlled trial of home-based vs. hospital-based pulmonary rehabilitation in post COVID-19 patients. *Eur J Phys Rehabil Med*. 2023;59(1):103-10. Available from: <https://doi.org/10.23736/S1973-9087.22.07702-4>.
82. Versace V, Ortelli P, Dezi S, Ferrazzoli D, Alibardi A, Bonini I, et al. Co-ultramicronized palmitoylethanolamide/luteolin normalizes GABA_B-ergic activity and cortical plasticity in long COVID-19 syndrome. *Clin Neurophysiol*. 2023;145:81-8. Available from: <https://doi.org/10.1016/j.clinph.2022.10.017>.
83. SBU. Postcovid – behandling och rehabilitering: en evidenskartä – juni 2022. Stockholm: Statens beredning för medicinsk och social utvärdering (SBU); 2021. SBU Bereder 328. Available from: <https://www.sbu.se/328>.
84. Calvache-Mateo A, Heredia-Ciuró A, Martín-Núñez J, Hernández-Hernández S, Reyckler G, López-López L, et al. Efficacy and Safety of Respiratory Telerehabilitation in Patients with Long COVID-19: A Systematic Review and Meta-Analysis. *Healthcare*. 2023;11(18):2519.

85. Chen H, Shi H, Liu X, Sun T, Wu J, Liu Z. Effect of Pulmonary Rehabilitation for Patients With Post-COVID-19: A Systematic Review and Meta-Analysis. *Frontiers in Medicine*. 2022;9. Available from: <https://doi.org/10.3389/fmed.2022.837420>.
86. Estebanez-Pérez M-J, Martín-Valero R, Vinolo-Gil MJ, Pastora-Bernal J-M. Effectiveness of Digital Physiotherapy Practice Compared to Usual Care in Long COVID Patients: A Systematic Review. *Healthcare*. 2023;11(13):1970.
87. Fox T, Hunt BJ, Ariens RAS, Towers GJ, Lever R, Garner P, et al. Plasmapheresis to remove amyloid fibrin(ogen) particles for treating the post-COVID-19 condition. *Cochrane Database of Systematic Reviews*. 2023(7). Available from: <https://doi.org/10.1002/14651858.CD015775>.
88. Lewthwaite H, Byrne A, Brew B, Gibson PG. Treatable traits for long COVID. *Respirology*. 2023;28(11):1005-22. Available from: <https://doi.org/https://doi.org/10.1111/resp.14596>.
89. Pouliopoulou DV, Macdermid JC, Saunders E, Peters S, Brunton L, Miller E, et al. Rehabilitation Interventions for Physical Capacity and Quality of Life in Adults With Post-COVID-19 Condition: A Systematic Review and Meta-Analysis. *JAMA Network Open*. 2023;6(9):e2333838-e. Available from: <https://doi.org/10.1001/jamanetworkopen.2023.33838>.
90. Wang J-Y, Pao J-B, Lee C-H, Wang J-Y, Lee M-C, Wu T-T. Corticosteroids for COVID-19-induced olfactory dysfunction: A comprehensive systematic review and meta-analysis of randomized controlled trials. *PLoS ONE*. 2023;18(12):e0289172. Available from: <https://doi.org/10.1371/journal.pone.0289172>.
91. SBU. Bedömning av systematiska översikter (ROBIS). Stockholm: Statens beredning för medicinsk och social utvärdering; 2020. [accessed May 2 2023]. Available from: https://www.sbu.se/globalassets/ebm/bedomning_systematiska_oversikter_robis.pdf.
92. Fluge O, Rekeland IG, Lien K, Thurmer H, Borchgrevink PC, Schafer C, et al. B-Lymphocyte Depletion in Patients With Myalgic Encephalomyelitis/Chronic Fatigue Syndrome: A Randomized, Double-Blind, Placebo-Controlled Trial. *Ann Intern Med*. 2019;170(9):585-93. Available from: <https://doi.org/10.7326/M18-1451>.
93. Gotaas ME, Stiles TC, Bjørngaard JH, Borchgrevink PC, Fors EA. Cognitive Behavioral Therapy Improves Physical Function and Fatigue in Mild and Moderate Chronic Fatigue Syndrome: A Consecutive Randomized Controlled Trial of Standard and Short Interventions. *Front Psychiatr*. 2021;12:580924. Available from: <https://doi.org/10.3389/fpsy.2021.580924>.
94. Joseph P, Pari R, Miller S, Warren A, Stovall MC, Squires J, et al. Neurovascular Dysregulation and Acute Exercise Intolerance in Myalgic Encephalomyelitis/Chronic Fatigue Syndrome: A Randomized, Placebo-Controlled Trial of Pyridostigmine. *Chest*. 2022;162(5):1116-26. Available from: <https://doi.org/10.1016/j.chest.2022.04.146>.
95. Nilsson MKL ZO, Gottfries CG, Matousek M, Peilot B, Forsmark S, et al. A randomised controlled trial of the monoaminergic stabiliser (–)-OSU6162 in treatment of myalgic encephalomyelitis/chronic fatigue syndrome. *Acta Neuropsychiatrica*. 2017:1-10.
96. Pinxsterhuis I SL, Strand EB, Bautz-Holter E, Sveen U. Effectiveness of a group-based self-management program for people with chronic fatigue syndrome: a randomized controlled trial. *Clin Rehabil*. 2017;31:93-103. Available from: <https://doi.org/10.1177/0269215515621362>.

97. Witham MD AF, McSwiggan S, Kennedy G, Kabir G, Belch JFF, et al. Effect of intermittent vitamin D3 on vascular function and symptoms in chronic fatigue syndrome-a randomised controlled trial. *Nutr Metab Cardiovasc Dis*. 2015;25:287-94.
98. SBU. Myalgisk encefalomyelit och kroniskt trötthetssyndrom (ME/CFS). En systematisk översikt. Stockholm: Statens beredning för medicinsk och social utvärdering (SBU); 2018. SBU Bereder 295. Available from: <https://www.sbu.se/295>.
99. Wormgoor MEA, Rodenburg SC. The evidence base for physiotherapy in myalgic encephalomyelitis/chronic fatigue syndrome when considering post-exertional malaise: a systematic review and narrative synthesis. *J*. 2021;19(1):1. Available from: <https://doi.org/10.1186/s12967-020-02683-4>.
100. Garvey MA, Perlmutter SJ, Allen AJ, Hamburger S, Lougee L, Leonard HL, et al. A pilot study of penicillin prophylaxis for neuropsychiatric exacerbations triggered by streptococcal infections. *Biol Psychiatry*. 1999;45(12):1564-71.
101. Murphy TK, Brennan EM, Johnco C, Parker-Athill EC, Miladinovic B, Storch EA, et al. A Double-Blind Randomized Placebo-Controlled Pilot Study of Azithromycin in Youth with Acute-Onset Obsessive-Compulsive Disorder. *J Child Adolesc Psychopharmacol*. 2017;27(7):640-51. Available from: <https://doi.org/https://dx.doi.org/10.1089/cap.2016.0190>.
102. Murphy TK, Parker-Athill EC, Lewin AB, Storch EA, Mutch PJ. Cefdinir for recent-onset pediatric neuropsychiatric disorders: a pilot randomized trial. *J Child Adolesc Psychopharmacol*. 2015;25(1):57-64. Available from: <https://doi.org/https://dx.doi.org/10.1089/cap.2014.0010>.
103. Perlmutter SJ, Leitman SF, Garvey MA, Hamburger S, Feldman E, Leonard HL, et al. Therapeutic plasma exchange and intravenous immunoglobulin for obsessive-compulsive disorder and tic disorders in childhood. *Lancet*. 1999;354(9185):1153-8.
104. Snider LA, Lougee L, Slattery M, Grant P, Swedo SE. Antibiotic prophylaxis with azithromycin or penicillin for childhood-onset neuropsychiatric disorders. *Biol Psychiatry*. 2005;57(7):788-92.
105. Williams KA, Swedo SE, Farmer CA, Grantz H, Grant PJ, D'Souza P, et al. Randomized, Controlled Trial of Intravenous Immunoglobulin for Pediatric Autoimmune Neuropsychiatric Disorders Associated With Streptococcal Infections. *J Am Acad Child Adolesc Psychiatry*. 2016;55(10):860-7.e2. Available from: <https://doi.org/https://dx.doi.org/10.1016/j.jaac.2016.06.017>.
106. Burchi E, Pallanti S. Antibiotics for PANDAS? Limited Evidence: Review and Putative Mechanisms of Action. *Prim Care Companion CNS Disord*. 2018;20(3):03. Available from: <https://doi.org/https://dx.doi.org/10.4088/PCC.17r02232>.
107. Cocuzza S, Maniaci A, La Mantia I, Nocera F, Caruso D, Caruso S, et al. Obsessive-Compulsive Disorder in PANS/PANDAS in Children: In Search of a Qualified Treatment-A Systematic Review and Metanalysis. *Children (Basel)*. 2022;9(2):26. Available from: <https://doi.org/https://dx.doi.org/10.3390/children9020155>.
108. Farhood Z, Ong AA, Discolo CM. PANDAS: A systematic review of treatment options. *Int J Pediatr Otorhinolaryngol*. 2016;89:149-53. Available from: <https://doi.org/https://dx.doi.org/10.1016/j.ijporl.2016.08.008>.

109. Frønsdal KB, Grøvan A. Behandling med intravenøs immunoglobulin ved PANS/PANDAS-tilstandene hos barn. Norway: Norwegian Institute of Public Health (NIPH); 2021. Available from: <https://www.fhi.no/en/publ/2021/Intravenous-immunoglobulin-treatment-in-children-with-PANS-PANDAS-conditions/>.
110. Johnson M, Ehlers S, Fernell E, Hajjari P, Wartenberg C, Wallerstedt SM. Anti-inflammatory, antibacterial and immunomodulatory treatment in children with symptoms corresponding to the research condition PANS (Pediatric Acute-onset Neuropsychiatric Syndrome): A systematic review. PLoS ONE. 2021;16(7):e0253844. Available from: <https://doi.org/https://dx.doi.org/10.1371/journal.pone.0253844>.
111. Sigra S, Hesselmark E, Bejerot S. Treatment of PANDAS and PANS: a systematic review. Neurosci Biobehav Rev. 2018;86:51-65. Available from: <https://doi.org/https://dx.doi.org/10.1016/j.neubiorev.2018.01.001>.
112. Gawlytta R, Kesselmeier M, Scherag A, Niemeyer H, Bottche M, Knaevelsrud C, et al. Internet-based cognitive-behavioural writing therapy for reducing post-traumatic stress after severe sepsis in patients and their spouses (REPAIR): results of a randomised-controlled trial. BMJ Open. 2022;12(3):e050305. Available from: <https://doi.org/10.1136/bmjopen-2021-050305>.
113. Schmidt K, Worrack S, Von Korff M, Davydow D, Brunkhorst F, Ehlert U, et al. Effect of a Primary Care Management Intervention on Mental Health-Related Quality of Life Among Survivors of Sepsis: A Randomized Clinical Trial. Jama. 2016;315(24):2703-11. Available from: <https://doi.org/10.1001/jama.2016.7207>.
114. Arnold AC, Okamoto LE, Diedrich A, Paranjape SY, Raj SR, Biaggioni I, et al. Low-dose propranolol and exercise capacity in postural tachycardia syndrome: a randomized study. Neurology. 2013;80(21):1927-33. Available from: <https://doi.org/10.1212/WNL.0b013e318293e310>.
115. Bourne KM, Sheldon RS, Hall J, Lloyd M, Kogut K, Sheikh N, et al. Compression Garment Reduces Orthostatic Tachycardia and Symptoms in Patients With Postural Orthostatic Tachycardia Syndrome. J Am Coll Cardiol. 2021;77(3):285-96. Available from: <https://doi.org/10.1016/j.jacc.2020.11.040>.
116. Coffin ST, Black BK, Biaggioni I, Paranjape SY, Orozco C, Black PW, et al. Desmopressin acutely decreases tachycardia and improves symptoms in the postural tachycardia syndrome. Heart Rhythm. 2012;9(9):1484-90. Available from: <https://doi.org/10.1016/j.hrthm.2012.05.002>.
117. Gamboa A, Paranjape SY, Black BK, Arnold AC, Figueroa R, Okamoto LE, et al. Inspiratory resistance improves postural tachycardia: a randomized study. Circ. 2015;8(3):651-8. Available from: <https://doi.org/10.1161/CIRCEP.114.002605>.
118. Green EA, Black BK, Biaggioni I, Paranjape SY, Bagai K, Shibao C, et al. Melatonin reduces tachycardia in postural tachycardia syndrome: a randomized, crossover trial. Cardiovasc Ther. 2014;32(3):105-12. Available from: <https://doi.org/10.1111/1755-5922.12067>.
119. Green EA, Raj V, Shibao CA, Biaggioni I, Black BK, Dupont WD, et al. Effects of norepinephrine reuptake inhibition on postural tachycardia syndrome. J Am Heart Assoc. 2013;2(5):e000395. Available from: <https://doi.org/10.1161/JAHA.113.000395>.
120. Kpaeyeh J, Jr., Mar PL, Raj V, Black BK, Arnold AC, Biaggioni I, et al. Hemodynamic profiles and tolerability of modafinil in the treatment of postural tachycardia syndrome: a

- randomized, placebo-controlled trial. *J Clin Psychopharmacol*. 2014;34(6):738-41. Available from: <https://doi.org/10.1097/JCP.0000000000000221>.
121. Mar PL, Raj V, Black BK, Biaggioni I, Shibao CA, Paranjape SY, et al. Acute hemodynamic effects of a selective serotonin reuptake inhibitor in postural tachycardia syndrome: a randomized, crossover trial. *J Psychopharmacol*. 2014;28(2):155-61. Available from: <https://doi.org/10.1177/0269881113512911>.
 122. Moon J, Kim DY, Lee WJ, Lee HS, Lim JA, Kim TJ, et al. Efficacy of Propranolol, Bisoprolol, and Pyridostigmine for Postural Tachycardia Syndrome: a Randomized Clinical Trial. *Neurother*. 2018;15(3):785-95. Available from: <https://doi.org/10.1007/s13311-018-0612-9>.
 123. Raj SR, Black BK, Biaggioni I, Harris PA, Robertson D. Acetylcholinesterase inhibition improves tachycardia in postural tachycardia syndrome. *Circulation*. 2005;111(21):2734-40.
 124. Smith EC, Diedrich A, Raj SR, Gamboa A, Shibao CA, Black BK, et al. Splanchnic Venous Compression Enhances the Effects of α -Blockade in the Treatment of Postural Tachycardia Syndrome. *J Am Heart Assoc*. 2020;9(14):e016196. Available from: <https://doi.org/10.1161/JAHA.120.016196>.
 125. Taub PR, Zadourian A, Lo HC, Ormiston CK, Golshan S, Hsu JC. Randomized Trial of Ivabradine in Patients With Hyperadrenergic Postural Orthostatic Tachycardia Syndrome. *J Am Coll Cardiol*. 2021;77(7):861-71. Available from: <https://doi.org/10.1016/j.jacc.2020.12.029>.
 126. Wheatley-Guy CM, Shea MG, Parks JK, Scales R, Goodman BP, Butterfield RJ, et al. Semi-supervised exercise training program more effective for individuals with postural orthostatic tachycardia syndrome in randomized controlled trial. *Clin Auton Res*. 2023;20:20. Available from: <https://doi.org/10.1007/s10286-023-00970-w>.
 127. Deng JC, Low PA, Opfer-Gehrking TL, Fj. Efficacy of compression on different capacitance beds to ameliorate orthostatic symptoms in patients with postural tachycardia syndrome (pots). *Jns*. 2001;187(Suppl. 1).
 128. Hasan B, Almasri J, Marwa B, Klaas KM, Fischer PR. Treatment of Postural Orthostatic Tachycardia Syndrome With Medication: A Systematic Review. *J Child Neurol*. 2020;35(14):1004-16. Available from: <https://doi.org/10.1177/0883073820948679>.
 129. Vasavada AM, Verma D, Sheggari V, Ghetiya S, Chirumamilla PC, Kotak RA, et al. Choices and Challenges With Drug Therapy in Postural Orthostatic Tachycardia Syndrome: A Systematic Review. *Cureus*. 2023;15(5):e38887. Available from: <https://doi.org/10.7759/cureus.38887>.
 130. Wells R, Elliott AD, Mahajan R, Page A, Iodice V, Sanders P, et al. Efficacy of Therapies for Postural Tachycardia Syndrome: A Systematic Review and Meta-analysis. *Mayo Clin Proc*. 2018;93(8):1043-53. Available from: <https://doi.org/10.1016/j.mayocp.2018.01.025>.
 131. McGuinness LA, Higgins JPT. Risk-of-bias VISualization (robvis): An R package and Shiny web app for visualizing risk-of-bias assessments. *Research Synthesis Methods*. 2020;n/a(n/a). Available from: <https://doi.org/10.1002/jrsm.1411>.