

Online Supplement

Randomized Controlled Trials on Chronic Obstructive Pulmonary Disease in Africa: A Systematic Review

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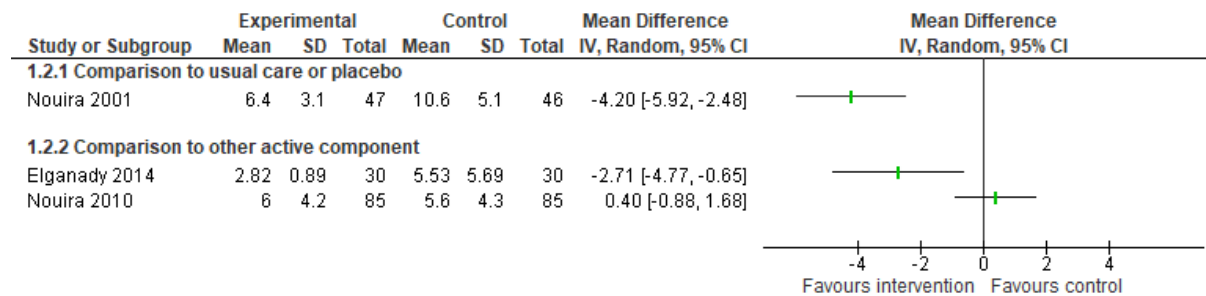


Figure S1: Summary of treatment effects in patients with acute exacerbation of COPD on length of mechanical ventilation (not included: Abroug 2014 and El Daim 2020 due to missing information, see table 3)

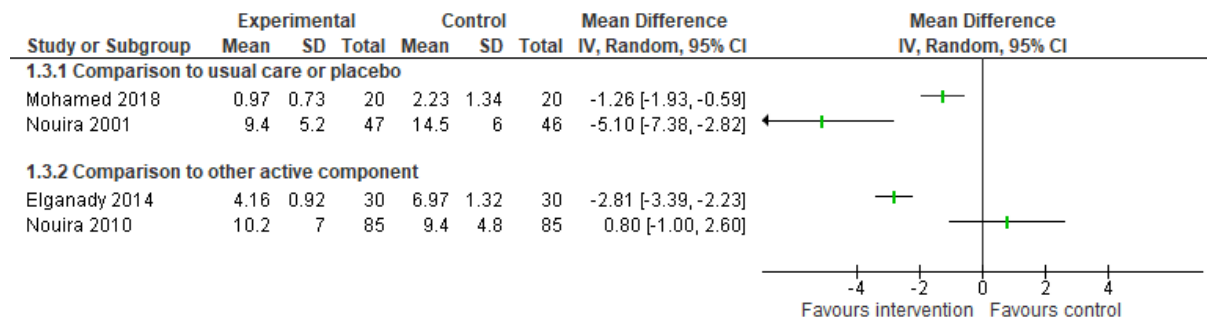


Figure S2: Summary of treatment effects in patients with acute exacerbation of COPD on length of stay in ICU (not included: El Daim 2020 due to missing information, see table 3)

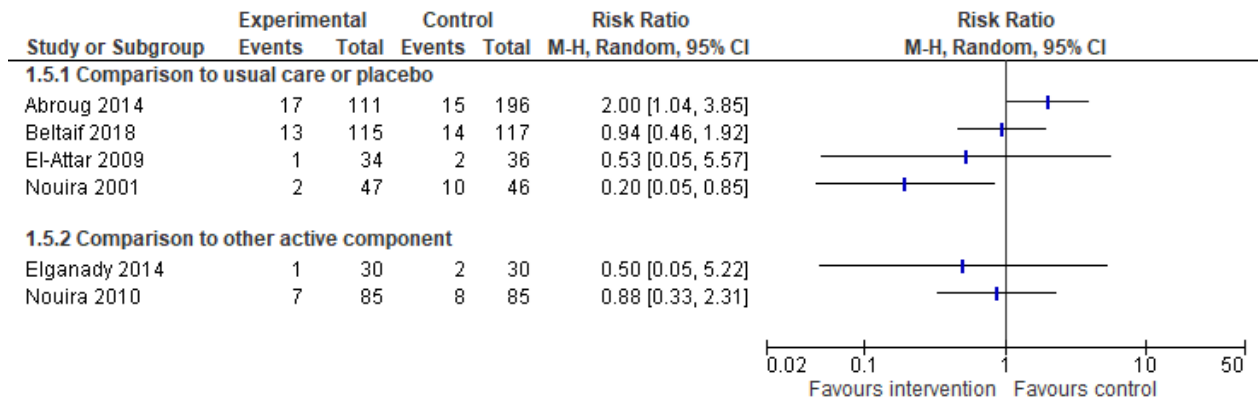


Figure S3: Summary of treatment effects in patients with acute exacerbation of COPD on mortality on length of in-hospital stay (not included: Abroug 2014 due to missing information, see table 3)

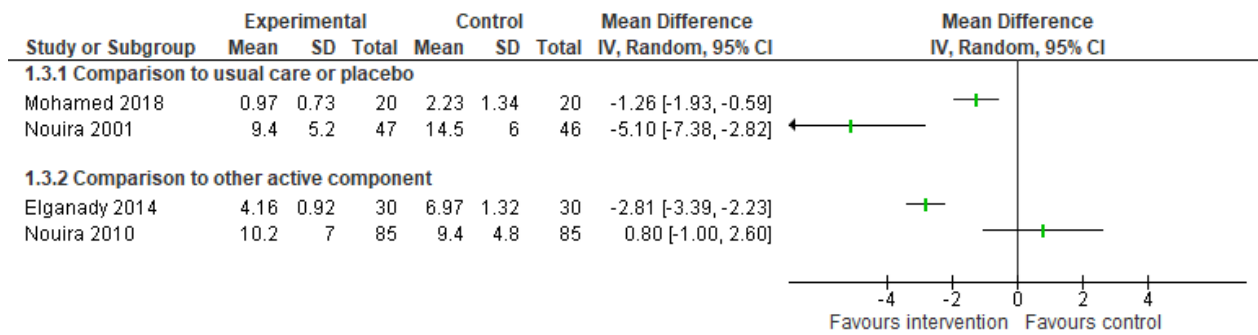


Figure S4: Summary of treatment effects on mortality in patients with acute exacerbation of COPD on mortality in the longest follow-up period (see table 3)

Search strategy

Medline (Ovid)

Nr.	Searches (last Search: 19.01.2022)	Number of references
Indication		
1.	Exp Lung Diseases, obstructive/	
2.	Exp Pulmonary disease, chronic obstructive/	
3.	copd.ti,ab.	
4.	(Chronic adj3 obstructive adj3 (pulmonar* or respirator* or airway)).ti,ab.	
5.	(chronic adj3 airway* adj3 obstruct*).ti,ab.	
6.	(Pulmonary adj3 emphysem*).ti,ab.	
7.	Exp asthma/	
8.	Asthma\$.ti,ab	
9.	Exp bronchitis/	
10.	(Chronic adj3 Bronchitis).ti,ab	
11.	(bronchiolitis or bronchiectasis or alviolitis).ti,ab..	
12.	(reduc* adj3 lung function).ti,ab.	
13.	(cystic adj3 fibrosis).ti,ab.	
14.	mucoviscidosis.ti,ab.	
15.	or/1-14	327599
16.	Africa\$.tw or exp Africa/	
17.	Algeria\$.tw or exp Algeria/	
18.	Angol\$.tw or exp Angola/	
19.	Benin\$.tw or exp Benin/	
20.	Botswan\$.tw or exp Botswana/	
21.	Burkina Faso.tw or exp Burkina Faso/	
22.	Burund\$.tw or exp Burundi/	
23.	Cameroon\$.tw or exp Cameroon/	
24.	Cape Verde.tw or exp Cape Verde/	
25.	Central African Republic\$.tw or exp Central African Republic/	
26.	Chad\$.tw or exp Chad/	
27.	Comoros\$.tw or exp Comoros/	
28.	Cote d'Ivoire.tw or exp Cote d'Ivoire/	
29.	Democratic Republic of Congo.tw or exp Democratic Republic of Congo	

30.	Djibout\$.tw or exp Djibouti/	
31.	Egypt\$.tw or exp Egypt/	
32.	Equatorial Guinea\$.tw or exp Equatorial Guinea/	
33.	Eritrea\$.tw or exp Eritrea/	
34.	Ethiop\$.tw or exp Ethiopia/	
35.	Gabon\$.tw or exp Gabon/	
36.	Gambia\$.tw or exp Gambia/	
37.	Ghana\$.tw or exp Ghana/	
38.	Guinea\$.tw or exp Guinea/	
39.	Guinea-Bissau.tw or exp Guinea-Bissau/	
40.	Kenya\$.tw or exp Kenya/	
41.	Lesoth\$.tw or exp Lesotho/	
42.	Liberia\$.tw or exp Liberia/	
43.	Libya\$.tw or exp Libya/	
44.	Madagascar\$.tw or exp Madagascar/	
45.	Malawi\$.tw or exp Malawi/	
46.	Mali.tw or exp Mali/	
47.	Mauritania\$.tw or exp Mauritania/	
48.	Mauritius\$.tw or exp Mauritius/	
49.	Morocc\$.tw or exp Morocco/	
50.	Mozambique\$.tw or exp Mozambique/	
51.	Namibia\$.tw or exp Namibia/	
52.	Niger.tw or exp Niger/	
53.	Nigeria\$.tw or exp Nigeria/	
54.	Rwanda\$.tw or exp Rwanda/	
55.	(Sao Tome and Principe).tw	
56.	Senegal\$.tw or exp Senegal/	
57.	Seychell\$.tw	
58.	Sierra Leone.tw or exp Sierra Leone/	
59.	Somalia\$.tw or exp Somalia/	
60.	South Africa\$.tw or exp South Africa.de	
61.	South Sudan.tw or exp South Sudan/	
62.	Sudan\$.tw or exp Sudan/	
63.	Swaziland\$.tw or exp Swaziland/	
64.	Tanzania\$.tw or exp Tanzania/	

65.	Togo\$.tw or exp Togo/	
66.	Tunisia\$.tw or exp Tunisia/	
67.	Uganda\$.tw or exp Uganda/	
68.	Zambia\$.tw or exp Zambia/	
69.	Zimbabwe\$.tw or exp Zimbabwe/	
70.	Somaliland\$.tw or exp Somaliland/	
71.	Sahrawi Arab Democratic Republic.tw	
72.	or/16-71	563619
73.	15 and 72	6453
Study design		
74.	randomized controlled trial.pt.	
75.	controlled clinical trial.pt.	
76.	(randomized. Or randomised or randomly).ti,ab	
77.	placebo.ab.	
78.	trial.ti,ab	
79.	groups.ti,ab.	
80.	or/74-79	
81.	exp animals/ not humans.sh.	
82.	80 not 81	
83.	73 and 84	990

CENTRAL

Nr.	Searches (Last Search: 14.04.2021)	Number of references
1	(Africa, explode all trees or Africa\$ or Algeria\$ or Angol\$ or Benin\$ or Botswan\$ or (Burkina Faso) or Burund\$ or Cameroon\$ or (Cape Verde) or (Central African Republic) or Chad\$ or Comoros\$ or Cote d'Ivoire or Congo\$ Djibout\$ or Egypt\$ or (Equatorial Guinea\$) or Eritrea\$ or Ethiop\$ or Gabon\$ or Gambia\$ or Ghana\$ or Guinea\$ or Guinea-Bissau or Kenya\$ or Lesoth\$ or Liberia\$ or Libya\$ or Madagascar\$ or Malawi\$ or Mali\$ or Mauritania\$ or Mauritius\$ or Morocc\$ or Mozambique\$ or Namibia\$ or Niger\$ or Nigeria\$ or Rwanda\$ or (Sao Tome and Principe) or Senegal\$ or Seychell\$ or Sierra Leone or Somalia\$ or (South Africa) or (South Sudan\$) or Sudan\$ or Swasiland or Tanzania\$ or Togo\$ or Tunisia\$ or Uganda\$ or Zambia\$ or Zimbabwe\$ or Somaliland or (Sahrawi Arab Democratic Republic))	
2	MESH descriptor Lung Diseases, Obstructive	
3	MESH descriptor Pulmonary Disease, Chronic Obstructive	
4	MESH descriptor Asthma	
5	MESH descriptor Bronchitis, Chronic	
6	(Chronic near obstructive near (pulmonar* or respirator* or airway))	
7	(chronic near airway near obstruct*)	
8	Pulmonary near emphysem*	
9	asthma*	
10	Chronic* near Bronchitis	
11	bronchiolitis or bronchiectasis or alviolitis or mucoviscidosis or (cystic near fibrosis)	
12	reduc* near (lung function)	
13	#2 or #3 or #4 or #5 or #6 or #7 or #8 or #9 or #10 or #11 or #12	62964 / 68769
14	#1 and #13	879 / 980
	Trials	584

CINAHL

Searches conducted: 8.10.2019 and 14.04.2021

(Africa\$ or Africa\$ or Algeria\$ or Angol\$ or Benin\$ or Botswan\$ or (Burkina Faso) or Burund\$ or Cameroon\$ or (Cape Verde) or (Central African Republic) or Chad\$ or Comoros\$ or Cote d'Ivoire or Congo\$ Djibout\$ or Egypt\$ or (Equatorial Guinea\$) or Eritrea\$ or Ethiop\$ or Gabon\$ or Gambia\$ or Ghana\$ or Guinea\$ or Guinea-Bissau or Kenya\$ or Lesoth\$ or Liberia\$ or Libya\$ or Madagascar\$ or Malawi\$ or Mali\$ or Mauritania\$ or Mauritius\$ or Morocco\$ or Mozambique\$ or Namibia\$ or Niger\$ or Nigeria\$ or Rwanda\$ or (Sao Tome and Principe) or Senegal\$ or Seychell\$ or Sierra Leone or Somalia\$ or (South Africa) or (South Sudan\$) or Sudan\$ or Swasiland or Tanzania\$ or Togo\$ or Tunisia\$ or Uganda\$ or Zambia\$ or Zimbabwe\$ or Somaliland or (Sahrawi Arab Democratic Republic)) in Abstract

AND

(chronic obstructive pulmonary disease) or asthma or (chronic obstructive lung disease) or (pulmonary emphysema) or (chronic bronchitis treatment) or bronchiolitis or bronchiectasis or alviolitis or mucoviscidosis or (cystic fibrosis) in Abstract

AND

In English

AND

Peer-reviewed

And

Humans

Suchlauf-Alert: "AB ((Africa\$ or Africa\$ or Algeria\$ or Angol\$ or Benin\$ or Botswan\$ or (Burkina Faso) or Burund\$ or Cameroon\$ or (Cape Verde) or (Central African Republic) or Chad\$ or Comoros\$ or Cote d'Ivoire or Congo\$ Djibout\$ or Egypt\$ or (Equatorial Guinea\$) or Eritrea\$ or Ethiop\$ or Gabon\$ or Gambia\$ or Ghana\$ or Guinea\$ or Guinea-Bissau or Kenya\$ or Lesoth\$ or Liberia\$ or Libya\$ or Madagascar\$ or Malawi\$ or Mali\$ or Mauritania\$ or Mauritius\$ or Morocco\$ or Mozambique\$ or Namibia\$ or Niger\$ or Nigeria\$ or Rwanda\$ or (Sao Tome and Principe) or Senegal\$ or Seychell\$ or Sierra Leone or Somalia\$ or (South Africa) or (South Sudan\$) or Sudan\$ or Swasiland or Tanzania\$ or Togo\$ or Tunisia\$ or Uganda\$ or Zambia\$ or Zimbabwe\$ or Somaliland or (Sahrawi Arab Democratic Republic))) AND AB ((chronic obstructive pulmonary disease) or asthma or (chronic obstructive lung disease) or (pulmonary emphysema) or (chronic bronchitis treatment) or bronchiolitis or bronchiectasis or alviolitis or mucoviscidosis or (cystic fibrosis)) Erscheinungsdatum: 20190101-20211231; In Englisch; Peer-Reviewed; Menschen AND Entsprechende Themen anwenden on 2021-04-14 08:25 AM"

Results (last search): 245 references

African Journals Online

<https://www.ajol.info/index.php/ajol>

<https://www.google.com/search?client=ms-google-coop&q=random+and+COPD+or+Chronic+obstructive+pulmonary+disease&cx=00779754043222069508:kprfz3-g5lc>

(search for random and COPD or Chronic obstructive pulmonary disease)

Last Search: 29.04. 2021, 117 results with 1 potentially eligible reference

African Index Medicus

<http://indexmedicus.afro.who.int/aim/>

Advanced search 29.04.2021

Titel, Expression booléenne: (COPD or Chronic obstructive pulmonary disease) AND (randomized or randomized) in
Titel

Last Search: 29.04. 2021, 29 results with no potentially eligible references

Pan African Clinical Trials Registry

<https://pactr.samrc.ac.za/Search.aspx>

Chronic obstructive pulmonary disease or COPD (Last Search: 29.4.2021): 14 studies

Trial ID (PACTR)	Title	Country	Principal investigator
202008893896971	HANDLING USI20 Study: Satisfaction assessment and Good Usage Practice of RS01® versus Handihaler® inhalers in patients with COPD, a randomized comparative multicenter study	Tunesia	Mohamed Lamine Megdiche
202005764510617	Short-term outcome of a home-based rehabilitation program in COPD tunisian patients	Tunesia	Dr. Nidhal Belloumi
201711002731292	Impact of pulmonary rehabilitation programme for COPD patient (not yet recruiting)	Tunisia	Marwa Mekki
201804002608316	Comparative Study of Segmental thoracic Spinal versus thoracic epidural anaesthesia for laparoscopic cholecystectomy (early terminated)	Egypt	Hatem El Moutaz Mahmoud

Table 1: Completed studies

Included studies

COPD (N=18 RCTs with 19 publications)

Abroug 2014

Abroug F, Ouanes-Besbes L, Fkih-Hassen M, Ouanes I, Ayed S, Dachraoui F, et al. Prednisone in COPD exacerbation requiring ventilatory support: an open-label randomised evaluation. *Eur Respir J.* 2014;43(3):717-24.

Acheche 2020

Acheche A, Mekki M, Paillard T, Tabka Z, Trabelsi Y. The Effect of Adding Neuromuscular Electrical Stimulation with Endurance and Resistance Training on Exercise Capacity and Balance in Patients with Chronic Obstructive Pulmonary Disease: A Randomized Controlled Trial. *Can Respir J.* 2020;2020:9826084.

Bateman 2008

Bateman ED, van Dyk M, Sagriotis A. Comparable spirometric efficacy of tiotropium compared with salmeterol plus fluticasone in patients with COPD: a pilot study. *Pulm Pharmacol Ther.* 2008;21(1):20-5.

Beltaief 2018

Beltaief K, Msolli MA, Zorgati A, Sekma A, Fakhfakh M, Marzouk MB, et al. Nebulized Terbutaline and Ipratropium Bromide Versus Terbutaline Alone in Acute Exacerbation of Chronic Obstructive Pulmonary Disease Requiring Noninvasive Ventilation: a Randomized Double-blind Controlled Trial. *Acad Emerg Med.* 2018.

Calligaro 2014

Calligaro GL, Raine RI, Bateman ME, Bateman ED, Cooper CB. Comparing dynamic hyperinflation and associated dyspnea induced by metronome-paced tachypnea versus incremental exercise. *COPD: Journal of Chronic Obstructive Pulmonary Disease.* 2014;11(1):105-12.

El-Attar 2009

El-Attar M, Said M, El-Assal G, Sabry NA, Omar E, Ashour L. Serum trace element levels in COPD patient: the relation between trace element supplementation and period of mechanical ventilation in a randomized controlled trial. *Respirology (Carlton, Vic).* 2009;14(8):1180-7.

El-Daim 2020

El-Daim A, El-Emery F, El-Dib A, El-Shamaa N. A study of different predictors of successful weaning off mechanical ventilation in ventilated patients with chronic obstructive pulmonary disease with acute respiratory failure. *Egyptian journal of chest diseases and tuberculosis.* 2020;69(3):485-92.

Elganady 2014

Elganady AA, Beshey BN, Abdelaziz AAH. Proportional assist ventilation versus pressure support ventilation in the weaning of patients with acute exacerbation of chronic obstructive pulmonary disease. *Egyptian journal of chest diseases and tuberculosis.* 2014;63(3):643-50.

Ghanem 2010

Ghanem M, Elaal EA, Mehany M, Tolba K. Home-based pulmonary rehabilitation program: effect on exercise tolerance and quality of life in chronic obstructive pulmonary disease patients. *Annals of thoracic medicine*. 2010;5(1):18-25.

Hassan 2015

Hassan WA, Shalan I, Elsobhy M. Impact of antibiotics on acute exacerbations of COPD. *Egyptian journal of chest diseases and tuberculosis*. 2015;64(3):579-85.

Magdy 2020

Magdy DM, Metwally A. Effect of average volume-assured pressure support treatment on health-related quality of life in COPD patients with chronic hypercapnic respiratory failure: a randomized trial. *Respir Res*. 2020;21(1):64.

Mehani 2017

Mehani SHM. Comparative study of two different respiratory training protocols in elderly patients with chronic obstructive pulmonary disease. *Clin Interv Aging*. 2017;12:1705-15.

Mekki 2019

Mekki M, Paillard T, Sahli S, Tabka Z, Trabelsi Y. Effect of adding neuromuscular electrical stimulation training to pulmonary rehabilitation in patients with chronic obstructive pulmonary disease: randomized clinical trial. *Clin Rehabil*. 2019;33(2):195-206.

Mkacher 2015

Mkacher W, Mekki M, Chaieb F, Tabka Z, Trabelsi Y. Balance Training in Pulmonary Rehabilitation: Effects on psychosocial outcomes. *Journal of Cardiopulmonary Rehabilitation and Prevention*. 2015;35(4):278-85.

Mkacher W, Mekki M, Tabka Z, Trabelsi Y. Effect of 6 Months of Balance Training During Pulmonary Rehabilitation in Patients With COPD. *Journal of Cardiopulmonary Rehabilitation and Prevention*. 2015;35(3):207-13.

Mohamed 2018

Mohamed AS, El-Sharawy DE. Noninvasive ventilation with add-on fiberoptic bronchoscopy in patients with chronic obstructive pulmonary disease. *Egyptian journal of chest diseases and tuberculosis*. 2018;67(1):26-31.

Mostafa 2021

Mostafa TM, El-Azab GA, Atia GA, Lotfy NS. The Effectiveness of 3 Combined Therapeutic Regimens in Egyptian Patients with Moderate-to-Severe Chronic Obstructive Pulmonary Disease: A Randomized Double-Blind Prospective Pilot Study. *Current therapeutic research, clinical and experimental*. 2021;94:100625.

Nouira 2001

Nouira S, Marghli S, Belghith M, Besbes L, Elatrous S, Abroug F. Once daily oral ofloxacin in chronic obstructive pulmonary disease exacerbation requiring mechanical ventilation: a randomised placebo-controlled trial. *Lancet (london, england)*. 2001;358(9298):2020-5.

Nouira 2010

Nouira S, Marghli S, Besbes L, Boukef R, Daami M, Nciri N, et al. Standard versus newer antibacterial agents in the treatment of severe acute exacerbation of chronic obstructive pulmonary disease: a randomized trial of trimethoprim-sulfamethoxazole versus ciprofloxacin. *Clinical infectious diseases*. 2010;51(2):143-9.

Asthma (N=49 RCTs with 51 publications)

Abdel Fattah 2011

Abdel Fattah M, Hamdy B. Pulmonary functions of children with asthma improve following massage therapy. *J Altern Complement Med.* 2011;17(11):1065-8.

Abdelbasset 2018

Abdelbasset WK, Alsubaie SF, Tantawy SA, Elyazed TIA, Kamel DM. Evaluating pulmonary function, aerobic capacity, and pediatric quality of life following a 10-week aerobic exercise training in school-aged asthmatics: a randomized controlled trial. *Patient preference and adherence.* 2018;12:1015-23.

Abdelhamid 2008

Abdelhamid E, Awad A, Gismallah A. Evaluation of a hospital pharmacy-based pharmaceutical care services for asthma patients. *Pharmacy practice.* 2008;6(1):25-32.

Abroug 1995

Abroug F, Nouira S, Bchir A, Boujdaria R, Elatrous S, Bouchoucha S. A controlled trial of nebulized salbutamol and adrenaline in acute severe asthma. *Intensive Care Med.* 1995;21(1):18-23.

Al-Biltagi 2012

Al-Biltagi M, Isa M, Bediwy AS, Helaly N, El Lebedy DD. L-carnitine improves the asthma control in children with moderate persistent asthma. *Journal of allergy.* 2012.

Ali 2017

Ali AM, Selim S, Abbassi MM, Sabry NA. Effect of alfacalcidol on the pulmonary function of adult asthmatic patients: A randomized trial. *Ann Allergy Asthma Immunol.* 2017;118(5):557-63.

Aloulou 2001

Aloulou I, Bousoffara R, Ben Khalifa M, Ben Saad H, Dessanges JF, Tabka Z, et al. In vitro and in vivo assessment of a Tunisian spacer device. *Revue francaise d'allergologie ET d'immunologie clinique.* 2001;41(6):537-43.

Ammorrha 2020

Amorha KC, Okonta MJ, Ukwe CV. Impact of pharmacist-led educational interventions on asthma control and adherence: single-blind, randomised clinical trial. *International Journal of Clinical Pharmacy.* 2020:1-9.

Anah 1980

Anah CO, Jarike LN, Baig HA. High dose ascorbic acid in Nigerian asthmatics. *Trop Geogr Med.* 1980;32(2):132-7.

Aweto 2017

Aweto HA, Aiyegbusi AI, Olaniyan ZO. A comparative study of the effects of incentive spirometry and diaphragmatic resistance training on selected cardiopulmonary parameters in patients with asthma. *Romanian Journal of Physical Therapy / Revista Romana de Kinetoterapie.* 2017;23(40):25-34.

Badawy 2014a

Badawy MS, Ismail SM, Abass MA. Efficacy of Carbamazepine in treatment of bronchial asthma. *Egyptian journal of chest diseases and tuberculosis*. 2014;63(1):15-20.

Badawy 2014b

Badawy MSH, Hassanin IMA. The value of magnesium sulfate nebulization in treatment of acute bronchial asthma during pregnancy. *Egyptian journal of chest diseases and tuberculosis*. 2014;63(2):285-9.

Bello 2004

Bello SO, Muhammad BY, Gammaniel KS, Abdu-Aguye I, Ahmed H, Njoku CH, et al. Randomized double blind placebo controlled clinical trial of Solanum melongena L. fruit in moderate to severe asthmatics. *Journal of medical sciences (Taipei, Taiwan)*. 2004;4:263-9.

Besbes-Ouanes 2000

Besbes-Ouanes L, Noura S, Elatrous S, Knani J, Boussarsar M, Abroug F. Continuous versus intermittent nebulization of salbutamol in acute severe asthma: a randomized, controlled trial. *Annals of emergency medicine*. 2000;36(3):198-203.

Biltagi 2009

Biltagi MA, Baset AA, Bassiouny M, Kasrawi MA, Attia M. Omega-3 fatty acids, vitamin C and Zn supplementation in asthmatic children: a randomized self-controlled study. [Retraction notice in CN-00839240]. *Acta paediatrica*. 2009;98(4):737-42.

Buchanan 1981

Buchanan DJ, Hillis A, Williams PN. A double blind controlled trial of Bencard house dust mite (Migen) hyposensitisation in Zambian asthmatics. *Med J Zambia*. 1981;15(1):14-6.

Dabbous 2017

Dabbous OA, Soliman MM, Mohamed NH, Elseify MY, Elsheikh MS, Alsharkawy AA, et al. Evaluation of the improvement effect of laser acupuncture biostimulation in asthmatic children by exhaled inflammatory biomarker level of nitric oxide. *Lasers in medical science*. 2017;32(1):53-9.

Dardouri 2020

Dardouri M, Sahli J, Ajmi T, Mtiraoui A, Bouguila J, Zedini C, et al. Effect of family empowerment education on pulmonary function and quality of life of children with asthma and their parents in Tunisia: A randomized controlled trial. *Journal of Pediatric Nursing*. 2020;54:e9-e16.

El-Ghitany 2012

El-Ghitany EM, Abd El-Salam MM. Environmental intervention for house dust mite control in childhood bronchial asthma. *Environ*. 2012;17(5):377-84.

El-Helbawy 2020

El-Helbawy R, Abdele-Azizb A, Elsisib H, Hassanb H. Exploring laser acupuncture effects and immunoglobulin e response in atopic asthma: can it revolutionize future treatment? *Egyptian journal of chest diseases and tuberculosis*. 2020;69(3):516-23.

Elkharwili 2020

Elkharwili DA, Ibrahim OM, Elazab GA, Elrifayy SM. Two regimens of dexamethasone versus prednisolone for acute exacerbations in asthmatic Egyptian children. *European journal of hospital pharmacy : science and practice*. 2020;27(3):151-6.

Goldin 1988

Goldin JG, Bateman ED. Does nedocromil sodium have a steroid sparing effect in adult asthmatic patients requiring maintenance oral corticosteroids? *Thorax*. 1988;43(12):982-6.

Ibrahim 2017

Ibrahim I-E, Elkolaly RM. What to use for bronchial asthma; nebulized or intravenous magnesium sulfate? *Egyptian journal of chest diseases and tuberculosis*. 2017;66(2):217-20.

Ibrahim 1993

Ibrahim SA, Elgurashi ED, Elkarim OA. Comparative study of intravenous aminophylline subcutaneous adrenaline and nebulised salbutamol in the treatment of acute asthma in children. *Pediatric reviews and communications*. 1993;7(3):175-82.

Ige 2010

Ige OM, Ohaju-Obodo JO, Chukwu C, Peters EJ, Okpapi J, Chukwuka C. Effectiveness and safety of adjustable maintenance dosing with budesonide/formoterol turbuhaler compared with traditional fixed doses in bronchial asthma: a multi-centre Nigerian study. *Afr J Med Med Sci*. 2010;39(3):165-72.

Ige 2002

Ige OM, Sogaolu OM. The clinical efficacy of fluticasone propionate (Fluvent) compared with beclomethasone dipropionates (Becotide) in patients with mild to moderate brochial asthma at the University College Hospital, Ibadan, Nigeria. *West Afr J Med*. 2002;21(4):297-301.

Ige 2004

Ige OM, Sogaolu OM. A single blinded randomised trial to compare the efficacy and safety of once daily budesonide (400microg) administered by turbuhaler with beclomethasone dipropionate (400microg) given twice daily through a metered-dose inhaler in patients with mild to moderate asthma. *African journal of medicine and medical sciences*. 2004;33(2):155-60.

Khayyal 2003

Khayyal MT, el-Ghazaly MA, el-Khatib AS, Hatem AM, de Vries PJ, el-Shafei S, et al. A clinical pharmacological study of the potential beneficial effects of a propolis food product as an adjuvant in asthmatic patients. *Fundam Clin Pharmacol*. 2003;17(1):93-102.

Le Roux 1991

Le Roux AM, Kotze D, Wium CA, Van Jaarsveld PP, Joubert JR. Inhaled and oral salbutamol: how effective in the prophylaxis of asthma? *Respiration; international review of thoracic diseases*. 1991;58(3-4):192-7.

Louw 2007

Louw C, Williams Z, Venter L, Leichtl S, Schmid-Wirlitsch C, Bredenbroker D, et al. Roflumilast, a phosphodiesterase 4 inhibitor, reduces airway hyperresponsiveness after allergen challenge. *Respiration; international review of thoracic diseases*. 2007;74(4):411-7.

Middle 1993

Middle MV, Müller FO, Schall R, Le Roux FP, du Plessis JB. Double-blind randomized cross-over trial of nocturnal elixir theophylline supplementation of a twice-daily sustained-release theophylline tablet formulation in asthmatic patients. *Chronobiology international*. 1993;10(4):277-89.

Middle 2002

Middle MV, Terblanché J, Perrin VL, Hertog MG. Bronchodilating effects of salbutamol from a novel inhaler Airmax. *Respir Med*. 2002;96(7):493-8.

Mohamed 2008

Mohamed MS, Saad HH, Abd El Khalek MG. Daily consumption of marjoram oil improve the health status of patients with asthma. *Pakistan journal of nutrition*. 2008;7(2):312-6.

Moustafa 2017

Moustafa IOF, ElHansy MHE, Al Hallag M, Fink JB, Dailey P, Rabea H, et al. Clinical outcome associated with the use of different inhalation method with and without humidification in asthmatic mechanically ventilated patients. *Pulm Pharmacol Ther*. 2017;45:40-6.

Nabil 2014

Nabil NM, Elessawy AF, Hosny KM, Ramadan SM. The effect of adding long acting beta 2 agonists to inhaled corticosteroids versus increasing dose of inhaled corticosteroids in improving asthma control. *Egyptian journal of chest diseases and tuberculosis*. 2014;63(4):761-4.

Nicola 2018

Nicola M, Elberry A, Sayed O, Hussein R, Saeed H, Abdelrahim M. The Impact of Adding a Training Device to Familiar Counselling on Inhalation Technique and Pulmonary Function of Asthmatics. *Advances in therapy*. 2018;35(7):1049-58.

Nouira 1999

Nouira S, Marghli S, Elatrous S, Knani J, Boussarsar M, Besbes L, et al. Nebulized salbutamol in acute severe asthma: comparison of two initial doses. *Clinical intensive care*. 1999;10(6):227-31.

Ohaju-Obodo 2005

Ohaju-Obodo JO, Chukwu C, Okpapi J, Egbagbe E, Ige MO, Chukwuka C, et al. Comparison of the efficacy and safety of budesonide turbuhaler administered once daily with twice the dose of beclomethasone dipropionate using pressurised metered dose inhaler in patients with mild to moderate asthma. *West Afr J Med*. 2005;24(3):190-5.

Radwan 2013

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1.1.1 Other chronic obstructive diseases (N=5 RCTs)

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