Supplemental Table 2 - Characteristics of all studies

| **Author, Year, Country** | **Study Design, Setting** | **Key Inclusion Criteria Including Asthma Diagnosis** | **Asthma Severity** | **Age, yr** | **n (% Female / % Male)** |
| --- | --- | --- | --- | --- | --- |
| *(Quasi-) Randomized Controlled Trials* | | | | | |
| Boyd (2012)36, USA | RCT, recreational centre + local exercise facility | Physician diagnosis of mild-moderate persistent asthma (as defined by the NAEPP guidelines) with ≥12% FEV1 reversibility. | Mild-Moderate | 53 (33–78) | 16 (94/6) |
| Bundgaard (1983)37, Denmark | RCT, outpatient clinic | 15-60 yr, perennial asthma with a daily need of ≥2 puffs of β-agonist, decreased PEF after 6 min of free running with HR >160 bpm on more than 20% of the highest PEF measured immediately before or immediately after exercise). | NR | Exercise: 37 (21-54)  Control: 37 (21-57) | 27 (41/59) |
| Cambach (1997)61, Netherlands | Randomised cross-over study, outpatient clinic (physiotherapy lab) | 18-75 yr, periodic dyspnoea with varying severity at present or in past, in combination with ≥15% increase in FEV1 after bronchodilation, or a histamine threshold (provocative concentration producing a 20% fall in FEV1) of ≤8 mg·mL-1. | Varied | 46 ± 14 | 43 (73/27) |
| Coelho (2018)38, Brazil | RCT, outpatient clinic | 18-65 yr, asthma diagnosis according to GINA guidelines for ≥6 mo, under regular drug therapy | NR | Exercise: 45 {19} Control: 47 {14} | 37 (86/14) |
| Dogra (2010 & 2011)62, 63, Canada | Quasi-RCT, community | ≥18+ yr, partly controlled asthma (i.e., experienced asthma symptoms regularly, but symptoms were not severe) + had a current prescription for asthma medication | Mild-moderate | Supervised Exercise: 34.2 ± 3.2  Unsupervised Exercise: 31.2 ± 4.2  Control:  34.0 ± 3.4 | 42 (74/26) |
| Emtner (1998 & 2005)65, 66, Sweden | RCT, gym + swimming pool | Chronic well-controlled asthma (according to ATS) of mild-moderate severity, FEV1 >75% of predicted after inhalation of a β2 agonist, no concomitant disease. | Mild-moderate | Land Exercise: 38 ± 12 Water Exercise: 34 ± 8 | 32 (44/56) |
| Evaristo (2020)73, Brazil | RCT, outpatient clinic | 30-65 yr, asthma diagnosed according to GINA guidelines, under medical treatment for ≥6 mo and clinically stable (i.e., no exacerbations or changes in medication for ≥30 d), BMI <35kg/m2, and sedentary. | Moderate-severe | Aerobic Exercise:  49.8 ± 9.7  Breathing Exercise:  50.6 ± 9.2 | 54 (72/28) |
| Farid (2005)40, Iran | RCT, allergy clinic | Confirmation of asthma with clinical examinations, pulmonary function tests, + skin prick test. | NR | Exercise: 27  Control: 29 | 36 (56/44) |
| Franca-Pinto (2015)41, Brazil | RCT, outpatient clinic | Asthma diagnosed according to GINA guidelines | NR | Exercise: 40 ± 11 Control: 44 ± 9 | 43 (79/21) |
| Freitas (2017 & 2018)68,69, Brazil | RCT, outpatient clinic | 30-60 yr with moderate or severe persistent asthma (according to GINA guidelines) and BMI 35-39.9 kg/m2 | Moderate-severe | Exercise: 45.9 ± 7.7  Control: 48.5 ± 9.6 | 51 (98/2) |
| Gonçalves (2008)43, Brazil | RCT, NR | 20-50 yr, asthma diagnosed according to GINA guidelines, BMI = 20-30 kg/m2 | Moderate-severe | Exercise: 34.6 [21-47]  Control: 34.6 [21-47] | 20 (65/35) |
| Haas (1987)44, USA | RCT, lab | Diagnosis of asthma and with demonstrable EIB (>15% reduction in FEV1 and reversed with bronchodilator) | NR | Exercise: 38.5 (20-62)  Control: 36.0 (21-69) | 22 (64/36) |
| Hiles (2021)74, Australia | RCT, medical research facility | ≥18 yr, severe asthma according to ERS/ATS guidelines, with variable airflow limitation in last 10 yr (bronchodilator response ≥12% or airway hyper-responsiveness or peak flow diary (variation ≥15% or >50 ml) | Severe | Yoga: 67 ± 9  Control: 68 ± 8 | 24 (58/42) |
| Lage (2021)75, Brazil | RCT, lab | 20-70 yr, asthma diagnosed according to GINA guidelines | Mild-severe | Exercise: 40 ± 13 Control: 42 ± 13 | 39 (74/36) |
| Majd (2020)76, England | RCT, outpatient clinic | Severe asthma (>6 mo), symptomatic despite on step 4 or 5 treatment according to the BTS/SIGN guidelines. | Severe | 54 ± 13 | 61 (62/38) |
| Mendes (2010 & 2011)21, 72, Brazil  *(NOTE: The two samples have 26 overlapping participants)* | RCT, NR | 20-50 yr, asthma diagnosed according to GINA guidelines | Moderate-severe | *2011*  Exercise: 37.9 (26–47)  Control: 36.0 (22–48) | *2011*  51 (82/18) |
|  |  |  |  | *2010*  Exercise: 39.0 (22-48) Control: 39.5 (24-47) | *2010*  89 (83/17) |
| Meyer (2015)48, Germany | Pseudo-RCT, outpatient clinic (local sports club) | Asthma diagnosed according to ATS diagnostic standards, confirmed by pulmonary specialist, + post-bronchodilator FEV1 ≥60% of predicted | NR | 56 ± 10 | 21 (62/38) |
| Rekha (2020)77, India | Quasi-RCT, hospital | 25-55 yr with stable mild-to-moderate asthma | Mild-moderate | NR | 30 (NR) |
| Scichilone (2012)53, Italy | RCT, outpatient clinic | Asthma diagnosed by pulmonologist according to GINA guidelines + skin test positive to at least one aeroallergen | Mild | 24 ± 2.5 | 15 (73/27) |
| Shaw (2010)54, South Africa | Quasi-RCT, NR | FVC, FEV1 and/or PEF 60-80% of predicted | NR | Exercise: 21.95 ± 3.87 Control: 21.90 ± 3.89 Breathing: 21.93 ± 3.95 Exercise + Breathing: 22.00 ± 3.95 | 88 (36/64) |
| Toennesen (2018)55, Denmark | RCT, hospital setting | 18-65 yr, BMI >20 + <30 kg/m2, ACQ ≥1.0, ≥1 positive diagnostic test of airflow obstruction | Mild-severe | Exercise: 39.4 ± 12.5  Diet: 40.7 ± 14.7 Exercise + Diet:  43.7 ± 13.9  Control: 38.2 ± 12.7 | Exercise: 29 (45/55)  Diet: 33 (76/24)  Exercise + Diet:  29 (76/24)  Control: 34 (76/24) |
| Türk (2020)56, Netherlands | RCT, outpatient clinic | 18-55 yr, BMI ≥30 kg/m2, ACQ≥0.75, diagnosed according to GINA guidelines with no exacerbation < 6 wk. | NR | 41.7±10.0 | 31 (74/26) |
| Turner (2011)58, Australia | RCT, outpatient hospital clinic physiotherapy clinic | ≥40 yr, moderate/severe asthma diagnosed and managed by a respiratory physician, with fixed airflow obstruction (FEV1 80% of predicted, FEV1 /FVC 80% of predicted, or residual volume >120% of predicted) | Moderate-severe | 67.8 ± 10.6 | 34 (56/44) |
| *Pre-Post Experimental Studies* | | | | | |
| Afzelius-Frisk (1977)35, Sweden | Pre-post experimental study, NR | NR | NR | 37 (23-51) | 10 (100/0) |
| Candemir (2017)60, Turkey | Pre-post experimental study, hospital-based outpatient clinic | Overweight and obese asthma patients | NR | 45 ± 9 | 35 (87/13) |
| de Nijs (2020)78, Netherlands | Non-randomised controlled study, outpatient clinic | 18–75 yr, uncontrolled severe refractory asthma diagnosed by pulmonologist according to ERS/ATS criteria. | Severe | 46.3 ± 14.1 | 138 (71/29) |
| Deniz (2019)39, Turkey | Pre-post experimental study, hospital-based setting | NR | NR | 55.3 ± 10.4 | 42 (81/19) |
| Emtner (1996 & 1998)67, 64, Sweden | Pre-post experimental study, inpatient + outpatient clinics (swimming pool) | Chronic well-controlled mild-moderate bronchial asthma, FEV1 >75% of predicted after inhalation of a β2 agonist, reversibility of ≥20% (increase in PEF after β2-agonist), + no concomitant disease. | Mild-moderate | 38 ± 9 | 58 (66/34) |
| Freeman (1989)42, England | Non-randomised controlled study, lab | NR | NR | Asthma: 26 ± 8  Control: 20 ± 1 | 15 (73/27) |
| Hallstrand (2000)45, USA | Non-randomised controlled study, NR | Mild intermittent asthma (as defined by the NAEPP Expert Panel Report 2) | Mild | Asthma: 28.8  Control: 31.0 | 10 (50/50) |
| Heba (2013)46, Egypt | Pre-post experimental study, NR | 20-35 yr, history of exercise-induced bronchoconstriction, resting FEV1 >80% of predicted + >15% decrease in FEV1 after an exercise challenge test, BMI 19-25 kg/m2 | NR | 27.48 ± 3.4 | 50 (40/60) |
| Hildenbrand (2010 & 2011)70, 71, USA | Pre-post experimental study, swimming pool | Physician-diagnosed, medically-managed asthma | NR | 22 ± 5.27 | 16 (56/44) |
| Mendes (2019)47, Brazil | Pre-post experimental study, outpatient clinic | 20-59 yr, diagnosed according to GINA guidelines, under medical treatment for ≥6 mo and clinically stable (i.e., no exacerbations or changes in medication for ≥30 d) | Moderate-severe | 36.7 ± 8.3 | 42 (81/19) |
| Miyamoto (2014)49, Japan | Pre-post experimental study, 2-wk inpatient followed by 10-wk outpatient | Respiratory physician diagnosis | NR | 71.4 ± 11 | 18 (61/39) |
| Peric (2018)50, Bosnia | Pre-post experimental study, NR | Physician diagnosis of mild-moderate persistent asthma as defined by GINA guidelines, with at least a 10-yer disease history | Mild-moderate | 42.8 ± 4.6 | 6 (100/0) |
| Robinson (1992)51, New Zealand | Non-randomised controlled study, non-hospital setting | 20-45 yr, asthmatics, FEV1 ≥75% of predicted. | Moderate-severe | Asthma: 34 ± 5  Control: 32 ± 8 | 15 (NR) |
| Sahin (2019)52, Turkey | Pre-post experimental study, institution pulmonary rehab unit | Clinically stable, uncontrolled or partly controlled, asthma diagnosed according to GINA guidelines | NR | 57 {49-64} | 49 (67/33) |
| Türk (2017)57, Netherlands | Pre-post experimental study, outpatient pulmonary rehabilitation | 18-55 yr, diagnosed according to GINA guidelines. | NR | 42 ± 10 | 111 (71/29) |
| Zampogna (2019)59, Italy | Pre-post experimental study, outpatient clinic | ≥18 yr, diagnosed and ≥12 mo pharmacological treatment according to GINA guidelines | Intermittent-severe | 63.9 ± 10.4 | 515 (61/39) |
| Age data are mean ± SD, mean (range), median [95% CI], median (IQR).  Abbreviations: ACQ, asthma control questionnaire; ATS, American Thoracic Society; BMI, body mass index; BTS, British Thoracic Society; EIB, exercise induced bronchospasm, ERS, European Respiratory Society; FEV1, forced expiratory volume in one second; GINA, Global Initiative for Asthma; ICS, inhaled corticosteroids; mg, milligram; mL, millilitre; NAEPP, National Asthma Education and Prevention Program; NR, not reported; PEF, peak expiratory flow; RCT, randomized controlled trial; Rehab, rehabilitation; SIGN, Scottish Intercollegiate Guideline Network; USA, United State of America | | | | | |