

Evaluation of the uptake, retention and effectiveness of exercise referral schemes for the management of mental health conditions in primary care: a systematic review

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Reasons for exclusion of full text articles

Reasons for exclusion:

- Different outcomes (n=20), *i.e. does not assess clinical effectiveness, uptake/adherence or long-term physical activity levels.*
- Different participant eligibility criteria (n=8)
- Did not meet ERS criteria (n=7)
- Mental health not primary referral reason (n=4)
- Qualitative (n=2)
- Not primary research (n=1)
- Study results reported elsewhere (n=1)

1. Orchard JW. Prescribing and dosing exercise in primary care. Australian Journal Of General Practice. 2020;49(4):182-6.

Reason for exclusion: different outcomes

Outcomes are about measuring exercise as a treatment method. There is no uptake/adherence analysis or analysis of mental health outcomes. There is some mention of depression but this is not explored directly.

2. Nau T, Nolan G, Smith BJ. Enhancing Engagement With Socially Disadvantaged Older People in Organized Physical Activity Programs. International Quarterly of Community Health Education. 2019;39(4):257-67.

Reason for exclusion: qualitative research

Outcomes are qualitative and structured through interviews. Only research with primarily quantitative data are included in this systematic review.

3. McGeechan GJ, Phillips D, Wilson L, Whittaker VJ, O'Neill G, Newbury-Birch D. Service Evaluation of an Exercise on Referral Scheme for Adults with Existing Health Conditions in the United Kingdom. International Journal of Behavioral Medicine. 2018;25(3):304-11.

Reason for exclusion: different outcomes

32 Outcomes are related to the amount of exercise conducted and the subject's waist
33 circumference and BMI. There are no mental health outcomes. There is data for
34 uptake/adherence but not for mental health subjects specifically.

35

36 **4. Bartlem KM, Bowman J, Freund M, Wye PM, Barker D, McElwaine KM, et al.**
37 **Effectiveness of an intervention in increasing the provision of preventive care by**
38 **community mental health services: a non-randomized, multiple baseline**
39 **implementation trial. Implementation Science. 2016;11:46.**

40 Reason for exclusion: different outcomes

41 Outcomes are related to client health behaviour risk status and the effect on their risk
42 behaviours, not mental health symptoms or outcomes. Uptake/adherence is not clearly
43 measured.

44

45 **5. Duda JL, Williams GC, Ntoumanis N, Daley A, Eves FF, Mutrie N, et al. Effects of a**
46 **standard provision versus an autonomy supportive exercise referral programme on**
47 **physical activity, quality of life and well-being indicators: a cluster randomised**
48 **controlled trial. International Journal of Behavioral Nutrition and Physical Activity.**
49 **2014;11(1):10.**

50 Reason for exclusion: different outcomes

51 Indicators of mental health are offered as an outcome but results are not displayed for
52 participants with mental health as their primary reason for referral.

53

54 **6. Rouse PC, Ntoumanis N, Duda JL, Jolly K, Williams GC. In the beginning: role of**
55 **autonomy support on the motivation, mental health and intentions of participants**
56 **entering an exercise referral scheme. Psychology & Health. 2011;26(6):729-49.**

57 Reason for exclusion: different outcomes

58 Outcomes are measuring the intentions of participants to engage in the exercise programme
59 before the study rather than assessing the results after the programme.

60

61 **7. Raine P, Truman C, Southerst A. The development of a community gym for people**
62 **with mental health problems: Influences on psychological accessibility. Journal of**
63 **Mental Health. 2002;11(1):43-53.**

64 Reason for exclusion: different outcomes

65 Outcomes are qualitative in nature and are based on the service development, not the clinical
66 outcomes of the patients or uptake/adherence.

67

68 **8. Fisher KJ, Li F. A community-based walking trial to improve neighborhood quality of**
69 **life in older adults: a multilevel analysis. *Annals of Behavioral Medicine*. 2004;28(3):186-**
70 **94.**

71 Reason for exclusion: different outcomes

72 Outcomes are not specific to a group suffering from mental health. Mental health is not the
73 primary reason for referrals. Primary care is not the main source of referrals.

74

75 **9. Bilderbeck AC, Brazil IA, Farias M. Preliminary evidence that yoga practice**
76 **progressively improves mood and decreases stress in a sample of UK prisoners.**
77 ***Evidence-Based Complementary and Alternative Medicine*. 2015;2015.**

78 Reason for exclusion: different outcomes

79 Mental health symptoms are an outcome but not specifically for patients with mental health
80 as the primary referral reason. The study setting is also in prisons, not primary care.

81

82 **10. Hardage J, Peel C, Morris D, Graham C, Brown CJ, Foushee HR, et al. Adherence**
83 **to Exercise Scale for Older Patients (AESOP): a measure for predicting exercise**
84 **adherence in older adults after discharge from home health physical therapy. *Journal of***
85 ***Geriatric Physical Therapy*. 2007;30(2):69-78.**

86 Reason for exclusion: different outcomes

87 Outcomes are looking at aspects that affect adherence but adherence is not measured directly.

88

89 **11. Messina E, Yoshitaka I. Analysis of Participation Levels in Activity Programming at**
90 **a Correctional Mental Health Facility. *Therapeutic Recreation Journal*. 2013;47(3):197-**
91 **211.**

92 Reason for exclusion: different outcomes

93 Outcomes are related to factors measuring participation, not uptake/adherence itself. Not
94 based in primary care.

95

96 **12. Bailey D, Kerlin L. Can Health Trainers Make a Difference With Difficult-to-**
97 **Engage Clients? A Multisite Case Study. *Health Promotion Practice*. 2015;16(5):756-64.**

98 Reason for exclusion: different outcomes

99 Data on the outcomes for mental health category is not clearly defined. Not based in primary
100 care.

101

102 **13. Forsyth A, Deane FP, Williams P. Dietitians and exercise physiologists in primary**
103 **care: lifestyle interventions for patients with depression and/or anxiety. Journal of**
104 **Allied Health. 2009;38(2):e-63.**

105 Reason for exclusion: different outcomes

106 Study uses same data set as one of the included studies in the review. Outcomes are different
107 and less preferable in this paper.

108

109 **14. Stewart L, Dolan E, Carver P, Swinton PA. Per-protocol investigation of a best**
110 **practice exercise referral scheme. Public Health (Elsevier). 2017;150:26-33.**

111 Reason for exclusion: different outcomes

112 Mental health patients are included in the review but there is no specific data for this group
113 regarding adherence or symptoms.

114

115 **15. Forsyth A, Williams P, Deane FP. Physical activity, but not fitness level, is**
116 **associated with depression in Australian adults. Journal of Sports Medicine & Physical**
117 **Fitness. 2015;55(7/8):845-54.**

118 Reason for exclusion: different outcomes

119 Outcomes measure physical activity levels, however the number of people taking up or
120 adhering to long-term physical activity levels is not studied.

121

122 **16. Zanetidou S, Belvederi Murri M, Menchetti M, Toni G, Asioli F, Bagnoli L, et al.**
123 **Physical Exercise for Late-Life Depression: Customizing an Intervention for Primary**
124 **Care. Journal of the American Geriatrics Society. 2017;65(2):348-55.**

125 Reason for exclusion: does not meet the ERS criteria

126 Does not fit ERS criteria outlined in this systematic review.

127

128 **17. Gusi N, Reyes MC, Gonzalez-Guerrero JL, Herrera E, Garcia JM. Cost-utility of a**
129 **walking programme for moderately depressed, obese, or overweight elderly women in**
130 **primary care: a randomised controlled trial. BMC public health. 2008;8(1):231.**

131 Reason for exclusion: different outcomes

132 Outcomes are looking at healthcare costs and cost-effectiveness of the ERS, not clinical
133 symptoms or uptake/adherence.

134

135 **18. Sowden SL, Breeze E, Barber J, Raine R. Do general practices provide equitable**
136 **access to physical activity interventions? British Journal of General Practice.**
137 **2008;58(555):e1-e8.**

138 Reason for exclusion: different outcomes

139 Participants with mental health conditions are included but there are no data outcomes
140 specifically for the group referred for mental health reasons.

141

142 **19. James DV, Johnston LH, Crone D, Sidford AH, Gidlow C, Morris C, et al. Factors**
143 **associated with physical activity referral uptake and participation. Journal of Sports**
144 **Sciences. 2008;26(2):217-24.**

145 Reason for exclusion: different outcomes

146 Uptake for mental health participants is measured but data is only compared to participants
147 referred for cardiovascular disease as an odds ratio. No separate data is presented for mental
148 health participants.

149

150 **20. Tobi P, Estacio EV, Yu G, Renton A, Foster N. Who stays, who drops out? Biosocial**
151 **predictors of longer-term adherence in participants attending an exercise referral**
152 **scheme in the UK. BMC Public Health. 2012;12(1):347.**

153 Reason for exclusion: different outcomes

154 A study using the same dataset is included in the review. This paper displays the adherence of
155 mental health participants in less detail than the study included in the review.

156

157 **21. O'Toole S, Maguire J, Murphy P. The efficacy of exercise referral as an intervention**
158 **for Irish male prisoners presenting with mental health symptoms. International Journal**
159 **of Prisoner Health. 2018.**

160 Reason for exclusion: does not meet participant eligibility criteria

161 Participants are referred from a prison, not primary care.

162

163 **22. Daley A, Winter H, Grimmett C, McGuinness M, McManus R, MacArthur C.**
164 **Feasibility of an exercise intervention for women with postnatal depression: a pilot**
165 **randomised controlled trial. British Journal of General Practice. 2008;58(548):178-83.**

166 Reason for exclusion: does not meet participant eligibility criteria
167 The main source of referral is from the psychiatric mother and baby unit (secondary care), not
168 from primary care.

169

170 **23. Pardo A, Violán M, Cabezas C, García J, Miñarro C, Rubinat M, et al. Effectiveness**
171 **of a supervised physical activity programme on physical activity adherence in patients**
172 **with cardiovascular risk factors. Apunts Medicina de l'Esport. 2014;49(182):37-44.**

173 Reason for exclusion: does not meet participant eligibility criteria

174 Participants are referred for cardiovascular reasons not mental health reasons.

175

176 **24. Ohlsen RI, Peacock G, Smith S. Developing a service to monitor and improve**
177 **physical health in people with serious mental illness. Journal of Psychiatric & Mental**
178 **Health Nursing (Wiley-Blackwell). 2005;12(5):614-9.**

179 Reason for exclusion: does not meet participant eligibility criteria

180 Referrals are made from nurse-led services (secondary care) not primary care.

181

182 **25. Taylor AH, Fox KR. Effectiveness of a primary care exercise referral intervention**
183 **for changing physical self-perceptions over 9 months. Health Psychology. 2005;24(1):11-**
184 **21.**

185 Reason for exclusion: does not meet participant eligibility criteria

186 Participants are not referred with mental health as the primary referral reason. Subsequently,
187 outcomes are not related to uptake/adherence or changes in mental health symptoms.

188

189 **26. Taylor AH, Doust J, Webborn N. Randomised controlled trial to examine the effects**
190 **of a GP exercise referral programme in Hailsham, East Sussex, on modifiable coronary**
191 **heart disease risk factors. Journal of Epidemiology & Community Health.**
192 **1998;52(9):595-601.**

193 Reason for exclusion: does not meet participant eligibility criteria

194 Mental health is not the primary referral reason for participants.

195

196 **27. James EL, Ewald BD, Johnson NA, Stacey FG, Brown WJ, Holliday EG, et al.**
197 **Referral for expert physical activity counseling: a pragmatic RCT. American Journal of**
198 **Preventive Medicine. 2017;53(4):490-9.**

199 Reason for exclusion: different outcomes

200 Some participants are referred for depression, but there is no data on uptake/adherence
201 specifically for these participants.

202

203 **28. Prior F, Coffey M, Robins A, Cook P. Long-Term Health Outcomes Associated With**
204 **an Exercise Referral Scheme: An Observational Longitudinal Follow-Up Study.**
205 **Journal of Physical Activity & Health. 2019;16(4):288-93.**

206 Reason for exclusion: does not meet participant eligibility criteria

207 Mental health is not the primary referral reason for participants.

208

209 **29. Midtgaard J, Stage M, Moller T, Andersen C, Quist M, Rorth M, et al. Exercise may**
210 **reduce depression but not anxiety in self-referred cancer patients undergoing**
211 **chemotherapy. Post-hoc analysis of data from the 'Body & Cancer' trial. Acta**
212 **Oncologica. 2011;50(5):660-9.**

213 Reason for exclusion: does not meet participant eligibility criteria

214 Referrals are not made from primary care.

215

216 **30. Helgadóttir B, Hallgren M, Kullberg CL, Forsell Y. Sticking with it? Factors**
217 **associated with exercise adherence in people with mild to moderate depression.**
218 **Psychology of Sport and Exercise. 2018;35:104-10.**

219 Reason for exclusion: does not meet the ERS criteria

220 The ERS intervention is not tailored to an individual's requirements.

221

222 **31. Krogh J, Lorentzen AK, Subhi Y, Nordentoft M. Predictors of adherence to exercise**
223 **interventions in patients with clinical depression—a pooled analysis from two clinical**
224 **trials. Mental Health and Physical Activity. 2014;7(1):50-4.**

225 Reason for exclusion: not primary research

226 This study is formed by the pooling of two clinical trials. Only studies with primary research
227 are included in this systematic review.

228

229 **32. van Straten A, Cuijpers P, Smits N. Effectiveness of a web-based self-help**
230 **intervention for symptoms of depression, anxiety, and stress: randomized controlled**
231 **trial. Journal of Medical Internet Research. 2008;10(1):e7-e.**

232 Reason for exclusion: does not meet the ERS criteria

233 ERS is done via self-help methods and is not an exercise referral scheme in the community.

234

235 **33. Sadeghi K, Ahmadi SM, Ahmadi SM, Rezaei M, Miri J, Abdi A, et al. A**
236 **comparative study of the efficacy of cognitive group therapy and aerobic exercise in the**
237 **treatment of depression among the students. Glob J Health Sci. 2016;8(10):54171.**

238 Reason for exclusion: does not meet the ERS criteria

239 Participants are instructed to exercise, but there is no distinct ERS service that the students
240 are referred to.

241

242 **34. Lord J, Green F. Exercise on prescription: does it work? Health Education Journal.**
243 **1995;54(4):453-64.**

244 Reason for exclusion: does not meet the ERS criteria

245 There is no monitoring of participants during the ERS programme.

246

247 **35. Murri MB, Amore M, Menchetti M, Toni G, Neviani F, Cerri M, et al. Physical**
248 **exercise for late-life major depression. The British Journal of Psychiatry.**
249 **2015;207(3):235-42.**

250 Reason for exclusion: did not meet the ERS criteria

251 Exercise intervention is not individualised to participants.

252

253 **36. Bombardier CH, Ehde DM, Gibbons LE, Wadhvani R, Sullivan MD, Rosenberg**
254 **DE, et al. Telephone-based physical activity counseling for major depression in people**
255 **with multiple sclerosis. Journal of Consulting & Clinical Psychology. 2013;81(1):89-99.**

256 Reason for exclusion: does not have mental health as a primary referral reason

257 Participants have both multiple sclerosis and major depressive disorder as the primary reason
258 for referral.

259

260 **37. Isaacs A, Critchley J, Tai SS, Buckingham K, Westley D, Harridge S, et al. Exercise**
261 **Evaluation Randomised Trial (EXERT): a randomised trial comparing GP referral for**
262 **leisure centre-based exercise, community-based walking and advice only. HEALTH**
263 **TECHNOLOGY ASSESSMENT-SOUTHAMPTON-. 2007;11(10).**

264 Reason for exclusion: does not have mental health as a primary referral reason

265 Participants are selected based on the fact that they have a cardiovascular risk factor not
266 mental health symptoms.

267

268 38. **Johnson NA, Ewald B, Plotnikoff RC, Stacey FG, Brown WJ, Jones M, et al.**
269 **Predictors of adherence to a physical activity counseling intervention delivered by**
270 **exercise physiologists: secondary analysis of the NewCOACH trial data. Patient**
271 **preference and adherence. 2018;12:2537.**
272 Reason for exclusion: does not have mental health as a primary referral reason
273 There are some participants who have concomitant depression with their chronic disease but
274 mental health is not the primary reason for referral.
275

276 39. **Edmunds J, Ntoumanis N, Duda JL. Adherence and well-being in overweight and**
277 **obese patients referred to an exercise on prescription scheme: A self-determination**
278 **theory perspective. Psychology of Sport and Exercise. 2007;8(5):722-40.**
279 Reason for exclusion: does not have mental health as a primary reason for referral
280 Participants are selected for fulfilling the overweight and obese criteria, mental health is not
281 the primary reason for referral.
282

283 40. **Hanson CL, Oliver EJ, Dodd-Reynolds CJ, Allin LJ. How do participant**
284 **experiences and characteristics influence engagement in exercise referral? A qualitative**
285 **longitudinal study of a scheme in Northumberland, UK. BMJ Open. 2019;9(2):e024370.**
286 Reason for exclusion: qualitative research
287 No quantitative data is provided for the outcomes of this systematic review.
288

289 41. **Hefferon K, Mallery R, Gay C, Elliott S. ‘Leave all the troubles of the outside**
290 **world’: a qualitative study on the binary benefits of ‘Boxercise’ for individuals with**
291 **mental health difficulties. Qualitative research in sport, exercise and health.**
292 **2013;5(1):80-102.**
293 Reason for exclusion: qualitative research
294 No quantitative data is provided on uptake/adherence or changes in mental health symptoms.
295

296 42. **Maier J, Jette S. Promoting Nature-Based Activity for People With Mental Illness**
297 **Through the US "Exercise Is Medicine" Initiative. American Journal of Public Health.**
298 **2016;106(5):796-9.**
299 Reason for exclusion: not primary research
300 This article is a review of other literature. Only studies with primary research are included in
301 this systematic review.

302

303 43. **Edwards RT, Linck P, Hounsome N, Raisanen L, Williams N, Moore L, et al. Cost-**
304 **effectiveness of a national exercise referral programme for primary care patients in**
305 **Wales: results of a randomised controlled trial. BMC Public Health. 2013;13(1):1021.**

306 Reason for exclusion: study results reported elsewhere

307 Same data set is used in a study (Murphy et al) that has been included in this systematic
308 review.

309

310