

Best Evidence Summaries of Topics in Mental Healthcare

BEST *in* **MH** *clinical question-answering service*

Question

“In adults of working age with schizophrenia or schizophrenia-like illnesses, how effective is physical exercise/activity compared to treatment as usual in terms of achieving improved patient outcomes?”

Clarification of question using PICO structure

Patients: Adults of working age with schizophrenia or schizophrenia-like illnesses
Intervention: Physical exercise/activity
Comparator: Treatment as usual
Outcome: Any patient outcomes

Clinical and research implications

There are a limited number of small studies addressing this question. Studies are heterogeneous in terms of exercise intervention, comparator and outcome measures reported. The available evidence indicates that, regular exercise programmes are possible in patients with schizophrenia, and can have beneficial effects on some measures of both physical and mental health and well-being. Larger randomised studies are required in order to confirm these findings.

What does the evidence say?

Number of included studies/reviews (number of participants)

We identified one Cochrane systematic review, which included three randomised controlled trials with a total of 86 participants. No additional randomised controlled trials were identified.

Main findings

The systematic review reported the results of three small studies. There were insufficient data to calculate pooled estimates of treatment effect for any of the outcomes considered.

Two very small studies (Beebe 2005 (n=12) and Marzaloni 2008 (n=13)) compared exercise therapy in addition to usual care with usual care over 16 and 12 weeks, respectively. The details of the exercise programmes varied (see table below). Both studies found improvements in some, but not all, measures of mental state assessed for the exercise group compared with usual care. Both studies reported data for ten patients who completed the study. Beebe et al. found significantly better PANSS negative scores in the exercise group than in the standard care group (mean difference (MD) -8.50, 95% CI -11.11 to -5.89). There was a smaller positive effect for PANSS positive scores (MD -2.5, 95% CI -4.73 to -0.27). Marzaloni et al. found significant improvements in the depression (MD 17.50, 95% CI 6.70 to 28.30) and anxiety scores (MD 8.00, 95% CI 0.80 to 15.20) of the Mental Health Inventory (MHI) for the exercise group compared to usual care, but no significant difference in the positive effect and behavioural scores, or overall rating. Marzaloni et al. also found improvements in some physical fitness outcome measures for the exercise group.

The third study (Duraiswamy 2007) compared exercise therapy in addition to usual care with yoga in addition to usual care over 16 weeks. Duraiswamy et al. found that yoga was associated with a better outcome for mental state than exercise therapy (n=41, PANSS total MD 14.95, 95% CI 2.60 to 27.30); PANSS negative scores were higher in the exercise group (n=41, MD 5.56, 95% CI 1.69 to 9.43), but there was no significant difference in PANSS positive scores. The yoga group also had significantly better scores on the physical domain of the World Health Organization Quality of Life BREF Version than those in the exercise group (n=41, MD -9.22 CI -18.86 to 0.42), however, there were no significant differences in the psychosocial and social domains.

There were no significant differences between treatment and comparator groups for any other outcome measure in any of the three included studies.

Authors conclusions

The systematic review concluded that, in line with previous studies, the small and heterogeneous studies identified indicated that, regular exercise programmes are possible in this population, and can have beneficial effects on some measures of both physical and mental health and well-being. The authors stated that larger randomised studies are required before any definitive conclusions can be drawn.

Reliability of conclusions/Strength of evidence

The review followed standard methodology and was clearly reported. The authors' conclusions accurately reflect the limited nature of the available data and are likely to be reliable.

What do guidelines say?

No relevant guidelines were identified.

Date question received: 27/02/2012

Date searches conducted: 06/03/2012

Date answer completed: 19/03/2012

References

Gorczynski P, Faulkner G. Exercise therapy for schizophrenia. *Cochrane Database of Systematic Reviews* 2010, Issue 5. Art. No.: CD004412. DOI: 10.1002/14651858.CD004412.pub2. (<http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD004412.pub2/pdf>)

Results

Systematic Reviews

Author (year)	Search Date	Inclusion criteria	Number of included studies	Summary of results	Risk of bias
Gorczynski P, Faulkner G	2008	<p><i>Studies</i> - All relevant randomised controlled trials. Quasi-randomised Studies were excluded, e.g. those allocating by using alternate days of the week. Cross-over trials, where participants receive different treatments sequentially, were also excluded, because of potential carry-over effects from all treatments. There were no restrictions on language or publication status.</p> <p><i>Participants</i> - People diagnosed with schizophrenia or schizophrenia-like illnesses using any criteria, with any length of illness and in any treatment setting. Trials were included where it was implied that the majority of the participants had a severe mental illness which was likely to be schizophrenia. No trials were excluded due to age, nationality or gender of participants.</p> <p><i>Intervention</i> Physical activity or exercise: any intervention, used alone or in conjunction with others, where physical activity or exercise was considered to be the main or active element. Interventions which included exercise</p>	3 studies N=86 (range 12 to 61)	<p>All three trials were randomised and two were single-blind and trial duration ranged from 12 to 16 weeks.</p> <p>All trials included people diagnosed with schizophrenia using DSM-IV criteria. Two studies (Beebe 2005 and Duraiswamy 2007) included both in- and out-patients and were conducted in hospital settings, whilst the remaining study (Marzaloni 2008) included only outpatients and was conducted in a community setting. The mean age of study participants was 32.3 years (range 18 to 63 years) and there were more male than female participants.</p> <p>The intervention (exercise programme) differed across the three studies): Beebe 2005: Three sessions per week of a ten minute warm-up followed by treadmill walking, increasing from 5 to 30 minutes over the duration of the study (16 weeks). Duraiswamy 2007: One hour daily sessions of brisk walking, jogging, exercises in standing and sitting postures and relaxation. Participants underwent three weeks of training followed by a three month programme. Marzaloni 2008: Twice weekly 90 minute sessions for 12 weeks. Sessions consisted of a ten minute warm-up, 20 minutes of resistance weight training, 60 minutes of aerobic training, and a 5 minute cool-down. Participants were encouraged to exercise one additional time per week independently.</p>	<p>None of the included studies were double-blinded and no study reported using concealment of allocation.</p> <p>Two studies (Beebe 2005 and Duraiswamy 2007) only reported data on participants who completed the study and all studies were considered to be at high risk of bias with respect to selective reporting of</p>

	<p>in a multiple component weight management programme were excluded since the specific effects of exercise on mental health could not be addressed.</p> <p><i>Comparison</i> Standard care: care that a person would normally receive had they not been included in the research trial. This could include interventions such as medication, hospitalisation, community psychiatric nursing input and day hospital.</p> <p>OR</p> <p>Other treatments: any other treatment (biological, psychological or social) such as medication, problem solving therapy, psycho-education, social skills training, cognitive-behavioural therapy, family therapy or psychodynamic psychotherapy. For a study to be included, the experimental and comparison interventions had to have had a similar duration.</p> <p><i>Outcomes</i> Outcomes were grouped according to assessments of mental and physical health, and health care utilisation and cost. Outcome measures were not grouped by different time periods. For a full list of included outcomes, please see the full paper. The broad categories were: mental state; general functioning; global state; behaviour; adverse events; physical fitness;</p>	<p>All exercise programmes were in addition to participants' usual care.</p> <p>The Comparator also differed across studies: Beebe 2005: Usual treatment, with participants told that they were on a waiting list for exercise therapy and given the opportunity to participate in exercise therapy at the end of the study. Duraismamy 2007: One hour yoga classes five times per week, in addition to usual care. Marzaloni 2008: Treatment as usual.</p> <p>All comparisons were measured at end-point.</p> <p>Mental state: Mental Health Inventory (MHI): Marzaloni et al. found significant improvements in the depression (n=10, MD 17.50, 95% CI 6.70 to 28.30) and anxiety scores (n=10, MD 8.00, 95% CI 0.80 to 15.20) for the exercise group compared to usual care, but no significant difference in the positive effect and behavioural scores, or overall rating. PANSS score: Beebe et al. found significantly better PANSS negative scores in the exercise group than in the standard care group (n=10, MD -8.50, 95% CI -11.11 to -5.89). There was a smaller positive effect for PANSS positive scores (n=10, MD -2.5, 95% CI -4.73 to -0.27). Duraismamy et al. found that yoga was associated with a better outcome for mental state than exercise therapy (n=41, PANSS total MD 14.95, 95% CI 2.60 to 27.30); PANSS negative scores were higher in the exercise group (n=41, MD 5.56, 95% CI 1.69 to 9.43), but there was no significant difference in PANSS positive scores.</p> <p>Physical fitness outcomes: Marzaloni et al. found a significant improvement in the six minute walk test, in the exercise group compared to those in standard care (n=13, MD 79.50,</p>	<p>outcomes.</p> <p>The systematic review used appropriate methods to minimise error and/or bias in the review process, did not restrict searches by language or publication status, and used a narrative synthesis which was appropriate given the small number and heterogeneous nature of the included studies.</p>
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		weight; service use; satisfaction with treatment; quality of life; economic outcomes		<p>95% CI 33.82 to 125.18), and also a significant increase in maximal strength (n=13, MD 2.00, 95% CI 0.55 to 3.45).</p> <p>Quality of life outcomes: Duraismwamy et al. found that patients in the yoga group had significantly better scores on the physical domain of the World Health Organization Quality of Life BREF Version than those in the exercise group (n=41, MD -9.22 CI -18.86 to 0.42), however, there were no significant differences in the psychosocial and social domains.</p> <p>There were no significant differences between treatment and comparator groups for any other outcome measure in any of the three included studies.</p> <p>There were no significant differences in numbers leaving the study early, between the exercise and usual care groups, or between the exercise and yoga groups.</p>	
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RCTs

Author (year)	Inclusion criteria	Number of participants	Summary of results	Risk of bias
Vancampfort et al (2012)	Over a 10-month period, in-patients with a DSMIV diagnosis of schizophrenia of the University Psychiatric Centre of Kortenberg and the Brussels Nighthospital Belgium were invited to participate. Patients were excluded if they had a DSM-IV diagnosis of substance dependence. The somatic exclusion criteria included evidence of significant cardiovascular, neuromuscular and	N=93	Excluded – This study is not an RCT. The authors assessed exercise capacity (as indicated by the six minute walk test) and global assessment of functioning (GAF) score in a cohort of patients with schizophrenia, with the aim of determining whether exercise capacity is associated with global function. Outcomes were measures of correlation. There was no exercise intervention in this study and no treatment effect was therefore measured.	

	endocrine disorders which, according to the American College of Sports Medicine, might prevent safe participation in exercise testing. Participants received a physical examination and baseline electrocardiogram before testing.			
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Risk of Bias: SRs

Author (year)	Risk of Bias				
	Inclusion criteria	Searches	Review Process	Quality assessment	Synthesis
Gorczyński 2008					

 Low Risk

 High Risk

 Unclear Risk

Search Details

Source	Search Strategy	Number of hits	Relevant evidence identified
SRs and Guidelines			
NICE	(schizophrenia OR psychosis) AND (Exercise OR physical OR activit*)	88	0
DARE	(outdoor activit*) 3 (psychosis) 195 (psychotic) 308 MeSH DESCRIPTOR Exercise EXPLODE ALL TREES 496 MeSH DESCRIPTOR Exercise Therapy EXPLODE ALL TREES 562 MeSH DESCRIPTOR Psychotic Disorders EXPLODE ALL TREES 107 #1 OR #2 OR #5 OR #6 2333 #3 OR #4 OR #7 408 #8 AND #9 11	11	1
Primary studies			
Central	#1 (psychosis) 2317 edit delete #2 exercise 37165 edit delete #3 outdoor* 425 edit delete #4 activit* 58043 edit delete #5 (#3 AND #4) 187 edit delete #6 MeSH descriptor Psychotic Disorders explode all trees 1327 edit delete #7 MeSH descriptor Exercise explode all trees 11115 edit delete #8 MeSH descriptor Physical Fitness, this term only 1812 edit delete #9 (#1 OR #6) 3015 edit delete #10 (#9) 3015 edit delete #11 MeSH descriptor Recreation explode all trees 7548 edit delete #12 (#9 AND #11) 7 edit delete #13 (#2 OR #5 OR #7 OR #8 OR #11) 39899 edit delete #14 (#9 AND #13) 157 edit delete #15 (#14), from 2005 to 2012 142 edit delete Central only	21	1

Medline	<ol style="list-style-type: none"> 1. MEDLINE; psychosis.ti,ab; 19998 results. 2. MEDLINE; Exercise.ti,ab; 150704 results. 3. MEDLINE; "Physical Exercise".ti,ab; 8159 results. 4. MEDLINE; Outdoor.ti,ab; 8593 results. 5. MEDLINE; activit*.ti,ab; 1946898 results. 6. MEDLINE; 4 AND 5; 1954 results. 7. MEDLINE; (outdoor ADJ activit*).ti,ab; 552 results. 8. MEDLINE; exp RECREATION/; 109829 results. 9. MEDLINE; PSYCHOTIC DISORDERS/; 28712 results. 10. MEDLINE; 1 OR 9; 40839 results. 11. MEDLINE; exp EXERCISE/; 91673 results. 12. MEDLINE; 2 OR 3 OR 6 OR 7 OR 8 OR 11; 259421 results. 13. MEDLINE; 10 AND 12; 194 results. 14. MEDLINE; "randomized controlled trial".pt; 320660 results. 15. MEDLINE; "controlled clinical trial".pt; 83580 results. 16. MEDLINE; randomized.ab; 236450 results. 17. MEDLINE; placebo.ab; 133240 results. 18. MEDLINE; "drug therapy".fs; 1504349 results. 19. MEDLINE; randomly.ab; 173985 results. 20. MEDLINE; trial.ab; 244136 results. 21. MEDLINE; groups.ab; 1140113 results. 22. MEDLINE; 14 OR 15 OR 16 OR 17 OR 18 OR 19 OR 20 OR 21; 2875594 results. 23. MEDLINE; 13 AND 22; 59 results. 24. MEDLINE; 23 [Limit to: Publication Year 2005-2012]; 32 results. 	32	
Embase	<ol style="list-style-type: none"> 11. EMBASE; psychosis.ti,ab; 26253 results. 12. EMBASE; Exercise.ti,ab; 177025 results. 13. EMBASE; "Physical Exercise".ti,ab; 10189 results. 14. EMBASE; Outdoor.ti,ab; 10919 results. 15. EMBASE; activit*.ti,ab; 2138157 results. 16. EMBASE; 14 AND 15; 2412 results. 17. EMBASE; (outdoor ADJ activit*).ti,ab; 656 results. 18. EMBASE; exp RECREATION/; 31953 results. 19. EMBASE; exp PSYCHOSIS/; 182942 results. 20. EMBASE; 11 OR 19; 186570 results. 21. EMBASE; exp EXERCISE/; 165412 results. 	175	

	<p>22. EMBASE; 12 OR 13 OR 16 OR 17 OR 18 OR 21; 275338 results. 23. EMBASE; 20 AND 22; 1402 results. 24. EMBASE; random*.ti,ab; 685834 results. 25. EMBASE; factorial*.ti,ab; 17939 results. 26. EMBASE; (crossover* OR cross-over*).ti,ab; 58302 results. 27. EMBASE; placebo*.ti,ab; 165687 results. 28. EMBASE; (doubl* ADJ blind*).ti,ab; 121746 results. 29. EMBASE; (singl* ADJ blind*).ti,ab; 11572 results. 30. EMBASE; assign*.ti,ab; 191900 results. 31. EMBASE; allocat*.ti,ab; 64571 results. 32. EMBASE; volunteer*.ti,ab; 149381 results. 33. EMBASE; CROSSOVER PROCEDURE/; 31987 results. 34. EMBASE; DOUBLE BLIND PROCEDURE/; 103334 results. 35. EMBASE; RANDOMIZED CONTROLLED TRIAL/; 298222 results. 36. EMBASE; SINGLE BLIND PROCEDURE/; 14881 results. 37. EMBASE; 24 OR 25 OR 26 OR 27 OR 28 OR 29 OR 30 OR 31 OR 32 OR 33 OR 34 OR 35 OR 36; 1136006 results. 38. EMBASE; 23 AND 37; 208 results. 39. EMBASE; 38 [Limit to: Publication Year 2005-2012]; 175 results</p>		
PsycINFO	<p>8. PsycINFO; psychosis.ti,ab; 23702 results. 9. PsycINFO; Exercise.ti,ab; 26856 results. 10. PsycINFO; "Physical Exercise".ti,ab; 1561 results. 11. PsycINFO; Outdoor.ti,ab; 2415 results. 12. PsycINFO; activit*.ti,ab; 254359 results. 13. PsycINFO; 11 AND 12; 777 results. 14. PsycINFO; (outdoor ADJ activit*).ti,ab; 189 results. 15. PsycINFO; exp PSYCHOSIS/; 82289 results. 16. PsycINFO; exp EXERCISE/; 13772 results. 17. PsycINFO; exp RECREATION/; 21577 results. 18. PsycINFO; 8 OR 15; 90625 results. 19. PsycINFO; 9 OR 10 OR 13 OR 14 OR 16 OR 17; 52156 results. 20. PsycINFO; 18 AND 19; 366 results. 21. PsycINFO; CLINICAL TRIALS/; 5843 results. 22. PsycINFO; random*.ti,ab; 106512 results.</p>	59	

	<p>23. PsycINFO; groups.ti,ab; 319141 results.</p> <p>24. PsycINFO; (double adj3 blind).ti,ab; 15699 results.</p> <p>25. PsycINFO; (single adj3 blind).ti,ab; 1159 results.</p> <p>26. PsycINFO; EXPERIMENTAL DESIGN/; 8147 results.</p> <p>27. PsycINFO; controlled.ti,ab; 66662 results.</p> <p>28. PsycINFO; (clinical adj3 study).ti,ab; 6652 results.</p> <p>29. PsycINFO; trial.ti,ab; 56080 results.</p> <p>30. PsycINFO; "treatment outcome clinical trial".md; 21218 results.</p> <p>31. PsycINFO; 21 OR 22 OR 23 OR 24 OR 25 OR 26 OR 27 OR 28 OR 29 OR 30; 489141 results.</p> <p>32. PsycINFO; 20 AND 31; 87 results.</p> <p>33. PsycINFO; 32 [Limit to: Publication Year 2005-2012]; 59 results.</p>		
Summary	NA	NA	

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