Mental Health as a Public Health Issue: Mental Health and Exercise

This list of journal articles focuses on the multi-faceted connections between mental health and physical activity, with topics relating to different types of physical activity (e.g., walking, biking, aerobics, sports), settings (e.g., indoors, outdoors, laboratory), and mental health promotion and addressing mental illness (e.g., depression, anxiety, schizophrenia). Because there has been a lot published on this topic, this list includes only a cross-section of articles published since 2000. Literature reviews appear first, followed by individual studies from the U.S. and other places in the world, along with a journal exclusively focused on the topic. This list is offered as a supplemental resource to the video located at z.umn.edu/cmhpbh.

LITERATURE REVIEWS

Link: http://www.tandfonline.com/doi/abs/10.1080/10413200008404214?src=recrecs
Summary: This article reviews literature using the Profile of Mood States (POMS) to chart the effects of exercise on people's moods. Many studies noted acute mood changes associated with exercise in non-clinical populations and chronic mood changes in clinical populations. Suggestions for future areas of research are discussed.

Link: http://bjsm.bmj.com/content/early/2011/07/31/bjsports-2011-090185.full.pdf+html
Summary: This article reviews literature on the association between physical activity and depression, anxiety, self-esteem, and cognitive functioning in children and adolescents. In general, a negative association was found between mental health and sedentary behavior. Studies reported evidence of beneficial effects of physical activity on mental health, though authors of this article thought the research designs were generally weak.

Summary: This article reviews literature on the impact of exercise on mental well-being and
mental health. Attention is paid to research relating to depression, anxiety, cognitive functioning, and applications to intervention and treatment programs.

**Citation:** Coon, J. T., Boddy, K., Stein, K., Whear, R., Barton, J., & Depledge, M. H. (2011). Does participating in physical activity in outdoor natural environments have a greater effect on physical and mental wellbeing than physical activity indoors? A systematic review. *Environmental Science & Technology*, 45(5), 1761-1772. doi:10.1021/es102947t

**Link:** [http://pubs.acs.org/doi/abs/10.1021/es102947t](http://pubs.acs.org/doi/abs/10.1021/es102947t)

**Summary:** This article provides a systematic review of studies comparing indoor and outdoor physical exercise with at least one physical or mental outcome. The authors found that exercise outdoors was associated with larger decreases in anger, depression, tension, and confusion and greater increases in feelings of positive engagement and revitalization than comparable activities indoors. While more satisfaction and enjoyment were reported with outdoor physical activities, there was also a decrease in calmness reported following such activities. Suggestions for future research are made.


**Link:** [http://www.karger.com/Article/Abstract/223730](http://www.karger.com/Article/Abstract/223730)

**Summary:** This article reviews literature on the relationship between physical activity and mental health as relates to neurological processes. Findings from both human and animal studies are explored.


**Summary:** This article reviews studies discussing the social and/or mental health benefits of sports participation. The most common benefits found included improved social interactions and self-esteem and fewer symptoms of depression. Participation in team sports appeared more beneficial than individual sports. The authors go on to propose their own conceptual model of the relationship between sports and social, psychosocial, and psychological domains.

**Citation:** Hughes, L., & Leavey, G. (2012). Setting the bar: Athletes and vulnerability to mental illness. *The British Journal of Psychiatry*, 200(2), 95-96.

**Link:** [http://bja.rcpsych.org/content/200/2/95.full](http://bja.rcpsych.org/content/200/2/95.full)

**Summary:** This article is geared towards primary care physicians and reviews literature on known risk factors for mental illness in athletes. Suggestions for future research on the area are made.


**Link:** [http://pediatrics.aappublications.org/content/138/3/e20161642.abstract](http://pediatrics.aappublications.org/content/138/3/e20161642.abstract)

**Summary:** This article reviews research on physical activity interventions taking place in a variety of locations (school, home, community, laboratory) that addressed mechanisms that were neurobiological, psychosocial, and/or behavioral in nature. The strongest evidence
related to improved physical self-perceptions and self-esteem. The authors describe a conceptual model for physical activity’s effects on child and adolescent mental health.


**Summary:** This article reviews literature on qualitative studies of physical activity interventions for severe and enduring mental health problems. Review of articles indicated the following themes: social interaction and support; feeling safe; a sense of purpose, meaning, and achievement; identity; role of facilitating personnel, and improved symptoms.


**Summary:** This article reviews research considering exercise’s role in preventing anxiety and depression. Also included is discussion of research related to exercise’s use in treatment of depression and anxiety, including considerations of dosage, compliance, and use with cognitive-behavior therapy.


**Link:** [https://www.asep.org/asep/asep/JEPonlineAUGUST2013_Morgan.pdf](https://www.asep.org/asep/asep/JEPonlineAUGUST2013_Morgan.pdf)

**Summary:** This article reviews literature relating to benefits of exercise interventions for mental disorders--depression, anxiety, and schizophrenia. Exercise intervention recommendations are provided for clinical exercise professionals and patients.


**Summary:** This article reviews existing literature on the connections between depression and anxiety symptoms and physical activity and exercise, including physical activity’s potential role in treatment of anxiety and depression. Implications of the literature review for clinical practice and further research are discussed.


**Summary:** This article focuses on the literature relating to exercise to mental health--both positive impacts on conditions such as depression and anxiety and negative impacts such as “overtraining syndrome” and “excessive exercise”. More research is suggested to identify specific mechanisms in the relationship between exercise and mental health.


**Link:** [http://journals.lww.com/co-psychiatry/Abstract/2005/03000/Exercise_and_well_being_a_review_of_mental_and.13.aspx](http://journals.lww.com/co-psychiatry/Abstract/2005/03000/Exercise_and_well_being_a_review_of_mental_and.13.aspx)

**Summary:** This article reviews literature on the connections between physical health, mental health, exercise, and physical activity. Research relating to both physical health conditions (eg., obesity. cancer) and depression and other mood disorders is considered. Study findings
indicate beneficial effects of exercise and physical activity interventions on mental and physical health outcomes.

**Citation:** Portugal, E. M. M., Cevada, T., Monteiro-Junior, R., Guimaraes, T. T., Rubini, E. D. C., Lattari, E., Blois, C., & Deslandes, A. C. (2013). **Neuroscience of exercise: From neurobiology mechanisms to mental health.** *Neuropsychobiology, 68*(1), 1-14. doi:10.1159/000350946  
**Link:** [http://www.karger.com/article/fulltext/350946](http://www.karger.com/article/fulltext/350946)

**Summary:** This article reviews literature relating to the interactions of exercise and mental health, with particular attention to the neuropsychobiology in play. One focus area relates to the relationship between exercise and specific mental disorders (major depression, dementia, and Parkinson’s). Connections between exercise and mood and relationship of these concepts to those engaged in sports are also reviewed.

**Citation:** Richardson, C. R., Faulkner, G., McDevitt, J., Skrinar, G. S., Hutchinson, D. S., & Piette, J. D. (2005). **Integrating physical activity into mental health services for persons with serious mental illness.** *Psychiatric Services, 56*(3), 324-331.  
**Link:** [http://ps.psychiatryonline.org/doi/pdf/10.1176/appi.ps.56.3.324](http://ps.psychiatryonline.org/doi/pdf/10.1176/appi.ps.56.3.324)

**Summary:** This article reviews literature related to physical activity and individuals with serious mental illness. Physical activity is important for this population to help prevent chronic physical health conditions (e.g., diabetes, cardiovascular disease), alleviating secondary symptoms to mental illness (e.g., low self-esteem, social withdrawal), and suggestions for incorporating physical activity into treatment.

**Link:** [http://www.tandfonline.com/doi/abs/10.1080/09638230500270776](http://www.tandfonline.com/doi/abs/10.1080/09638230500270776)

**Summary:** This article reviews literature on the association between lack of regular physical activity and mental disorders. Themes of physical activity as a promoter of mental wellbeing and use of physical activity to prevent and treat common mental disorders are explored. The authors suggest that mental health practitioners may be an underused resource for promoting physical activity and that there is need for additional research in this area.

**Citation:** Strohle, A. (2009). **Physical activity, exercise, depression and anxiety disorders.** *Journal of Neural Transmission, 116*(6), 777-784. doi:10.1007/s00702-008-0092-x  

**Summary:** This article sought to critically review literature on the association between physical activity, exercise and prevalence and incidence of anxiety disorders and depression and the therapeutic utility of exercise for patients with anxiety disorders or depression. Reduced incidence rates of some anxiety disorders and depression have been found by those who exercise and exercise training may be an effective intervention for those with panic disorder and major depression, though clinical usage of exercise is in the beginning stages. The author advises that more research is needed.

**STUDIES FROM THE UNITED STATES**

**Citation:** Adams, T. B., Moore, M. T., & Dye, J. (2007). **The relationship between physical activity and mental health in a national sample of college females.** *Women & Health, 45*(1), 69-85.  
**Link:** [http://www.tandfonline.com/doi/abs/10.1300/J013v45n01_05](http://www.tandfonline.com/doi/abs/10.1300/J013v45n01_05)

**Summary:** This study looked at the relationship between two kinds of exercise (strength training and vigorous/moderate) and mental health in female college students. Data came from the National College Health Assessment. Analysis indicated that both strength training and vigorous/moderate exercise were positively associated with perceived health. While
vigorous/moderate exercise had a modest negative association with depression, strength training was modestly negatively associated with anxiety, depression, and suicidal ideation. Suggestions for future research are made.

Link: http://jpepsy.oxfordjournals.org/content/early/2011/01/10/jpepsy.jsq107.short
Summary: This meta-analysis considered 73 published and unpublished studies looking at the relationship between physical activity and mental health in children. Results indicated that effects varied depending on methodology of study and characteristics of participants, though in general there were small but significant effects of physical activity on children’s mental health found.

Summary: This study sought to assess the relationship between physical activity and sad feelings and suicidal thoughts and behaviors. The sample was comprised of 1,870 Texas high school students who were administered a modified 2001 Youth Risk Behavior Survey. Gender differences were found in which more boys reported physical activity and more girls reported sad feelings and suicidal ideation and planning. Additionally, higher attendance in physical education class was associated with fewer feelings of sadness, greater weekly physical activity sessions was associated with lower risk of suicide ideation, and higher levels of vigorous physical activity and strength and toning activity was associated with lower risk of suicide planning.

Link: http://link.springer.com/article/10.1007/BF02879894
Summary: This study used a randomized control trial design to examine the effects of a 4-month exercise intervention on mental health outcomes of 164 middle-aged women. Pre- and post-measures of psychological measures, body composition, and fitness were obtained. Physical activity appeared to enhance mood menopause-related quality of life.

Link: https://www.researchgate.net/profile/Madhukar_Trivedi2/publication/7376645_Inverse_Association_between_Physical_Inactivity_and_Mental_Health_in_Men_and_Women/links/00463516cc5caa83df000000.pdf
Summary: The Aerobics Center Longitudinal Study (ACLS) evaluates associations between measures of mental health and physical activity. The sample is comprised of 5451 men and 1277 women, ages 20-88, who complete both a physical fitness test and a variety of self-report measures. No significant gender difference was reported. Both men and women had a significant inverse relationship between levels of cardiorespiratory fitness and depressive symptoms and a significant positive relationship between levels of cardiorespiratory fitness and emotional well-being. The dose-response relationship peaked at physical activity levels of 11-19 miles per week.
**Citation:** Goodwin, R. D. (2003). Association between physical activity and mental disorders among adults in the United States. Preventative Medicine, 36(6), 698-703. doi:10.1016/S0091-7435(03)00042-2


**Summary:** This study used data from the National Comorbidity Survey that had a nationally representative sample of 8098 individuals ages 15-54. Regression analyses revealed that 60.3% reported regular physical activity, that regular physical activity significantly decreased prevalence of depression and anxiety disorders but not other mental disorders, and that a dose-response relationship was evident between self-reported physical activity and current depressive and anxiety disorders. Further research to identify specific mechanisms is suggested.

**Citation:** Kim, Y. S., Park, Y. S., Allegrante, J. P., Marks, R., Ok, H., Cho, K. O., & Garber, C. E. (2012). Relationship between physical activity and general mental health. Preventative Medicine, 55(5), 458-463.


**Summary:** This study looked for the optimal amount of physical activity to promote better mental health. Data came from the randomly sampled U.S. Health Information National Trends Survey (HINTS). Analysis indicated a curvilinear relationship between physical activity and general mental health, with the maximum mental health benefits seen with physical activity of 2.5 to 7.5 hours per week.

**AUSTRALIAN STUDIES**

**Citation:** Bailey, M., & McLaren, S. (2005). Physical activity alone and with others as predictors of sense of belonging and mental health in retirees. Aging and Mental Health, 9(1), 82-90.


**Summary:** This study tested a model that incorporated physical activities performed with others and alone as predictors of depression, suicide ideation, and a sense of belonging. The Australian sample was comprised of 87 males and 107 females who were retired, with a mean age of 68. Participants filled out a variety of surveys and self-report instruments. Results indicated that neither of the two physical activity conditions predicted depression, suicide ideation, or a sense of belonging. What did make a difference in a sense of belonging and self-reported mental health was having motivation and abilities to belong. The authors concluded that simply offering physical activities in group settings may not be enough--facilitation of a sense of belonging may be required for the individual’s mental health to be enhanced.


**Link:** [http://www.psychiatrist.com/jcp/article/Pages/2014/v75n09/v75n0915.aspx](http://www.psychiatrist.com/jcp/article/Pages/2014/v75n09/v75n0915.aspx)

**Summary:** This meta-analytic study looked at the effects of physical activity on depressive symptoms and other things (e.g., schizophrenia, quality of life, aerobic capacity) impacting people with mental illness, along with the heterogeneity between studies. Results indicated that physical activity had a large effect on symptoms of depression and schizophrenia.
**CANADIAN STUDIES**

**Citation:** Jewett, R., Sabiston, C. M., Brunet, J., O'Loughlin, E. K., Scarapicchia, T., & O'Loughlin, J. (2014). *School sport participation during adolescence and mental health in early adulthood*. *Journal of Adolescent Health, 55*(5), 640-644.


**Summary:** This study looked at the association between secondary school sports participation and mental health in early adulthood. The Canadian sample of 853 adolescents reported their participation in sports throughout their years in secondary school and then reported on their the mental health symptoms in early adulthood. The results indicated that secondary school sports involvement was a significant predictor of mental health status in early adulthood—with lower levels of perceived stress, fewer depression symptoms, and a higher self-rating of mental health.

**EUROPEAN STUDIES**


**Summary:** This study looked at the relationship between weekly physical activity and mental health. Data came from the Eurobarometer study, a face-to-face interview study of 16,230 individuals ages 15+ living in fifteen European nations. Results indicated that, in general, those people who were more physically active had better mental health. While in some of the countries there was evidence for a dose-response relationship between physical activity and mental health, this was not found across all of the countries.

**Citation:** Asztalos, M., Bourdeaudhuij, I. D., & Cardon, G. (2010). *The relationship between physical activity and mental health varies across activity intensity levels and dimensions of mental health among women and men*. *Public Health Nutrition, 13*(8), 1207-1214. doi:10.1017/S136898009992825


**Summary:** This study looked at gender variation in the physical activity intensity and mental health. The representative sample of 6,803 adults, ages 25-64, were part of the Belgian National Health Interview Survey. Results showed gendered differences. Men showed inverse associations between vigorous intensity physical activity and feelings of anxiety, depression, and somatisation symptoms. Women showed an inverse association between moderate intensity physical activity and somatisation symptoms and a positive association between walking and emotional well-being.


**Summary:** This study looked at the association between five types of physical activity (housework, biking, walking, sports, leisure active transportation) and two dimensions of mental health (perceived stress and psychological distress). The sample was 1,919 adults, 20-65 year old, participating in the Flemish Policy Research Centre Sport, Physical Activity and...
Health study. Results indicated participation in sports was inversely associated with both stress and distress. Housework was associated with differing effects for different groups—it was associated with more stress and distress in women with blue-collar jobs and less distress in young adults with white-collar jobs. For men in blue-collar jobs, biking to and from work was associated with more stress.

Link: http://her.oxfordjournals.org/content/20/5/600.short
Summary: This qualitative grounded theory study looked at the relationship between mental health and physical activity in three types of settings (local authority leisure centre, local authority leisure centre with countryside hikes, and private health club). Pre- and post-focus groups were held along with interviews of 18 people in England. The result of analysis indicated a conceptual framework providing a psycho-social explanation of physical activity-mental health relationship from the participants' perspectives.

Link: http://bjsm.bmj.com/content/43/14/1111.short
Summary: This study examined the association between physical activity and mental health in a representative sample of 19,842 women and men participating in the Scottish Health Surveys. Self-reported data was collected using the General Health Questionnaire (GHQ-12) and logistic regression was used in creation of risk estimates for each category of weekly physical activity. Results indicated that daily physical activity reduced likelihood of psychological distress after controlling for other variables (e.g., age, BMI, SES). A dose-effect pattern was noted for all physical activities with the strongest effect associated with participation in sports.

Link: http://www.sciencedirect.com/science/article/pii/S0091743599905972
Summary: This study looked at the association between measures of psychological well-being and frequency of physical exercise. The sample comprised 1547 men and 1856 women, ages 25-64, participating in the Finnish cardiovascular risk factor survey, which included measures of mental health in addition to those for physical health and activity. Results indicated that those exercising at least 2-3 times a week experienced significantly fewer symptoms of depression, anger, cynical distrust, and stress that those who exercised less frequently. Those reporting more regular exercise perceived their fitness and health to be better than those who exercised infrequently.

Summary: This was a two-year longitudinal study looking at the associations between self-reported physical activity and perceived stress, burnout, and symptoms of anxiety and depression. The sample includes 420 men and 2,694 women working in western Sweden. Results indicated that those with a sedentary lifestyle were more likely to report high levels of perceived stress, burnout, and symptoms of anxiety and depression than those who reported at least light physical activity.
**Citation:** Lidwall, M., Ljung, T., Hadzibajramovic, E., & Jonsdottir, I. H. (2012). **Self-reported physical activity and aerobic fitness are differently related to mental health.** *Mental Health and Physical Activity, 5*(1), 28-34.


**Summary:** This study looked at the relationship between mental health and aerobic fitness and self-reported physical activity, including whether aerobic fitness mediates the relationship between mental health and self-reported physical activity. The sample included 177 Swedish adults with a mean age of 39. Both self-report surveys and physical testing were used. Analysis indicated that regularly performed light to moderate exercise seemed associated with better mental health than physical inactivity and that aerobic fitness was not functioning as a mediator.

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**Citation:** Mitchell, R. (2013). **Is physical activity in natural environments better for mental health than physical activity in other environments?** *Social Science & Medicine, 91*, 130-134. doi:10.1016/j.socscimed.2012.04.012


**Summary:** This study explored whether people who were in natural environments as part of their physical activity have been mental health than those whose physical activity takes place in non-natural environments. The data came from the 2008 Scottish Health Survey, which has a cross-sectional sample of respondents ages 16+ years. Results indicated an independent association between regular use of natural environments and lower risk for poor mental health and a relationship between regular use of non-natural environments and greater mental well-being.

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**Citation:** Pretty, J., Peacock, J., Sellens, M., & Griffin, M. (2005). **The mental and physical health outcomes of green exercise.** *International Journal of Environmental Health Research, 15*(5), 319-337.


**Summary:** This study looked at whether there may be a synergistic benefit of being exposed to nature while exercising (‘green exercise’). The sample was composed of 55 women and 45 men, ages 18-60, in the UK who ran on treadmills with both a plain wall and different types of projected imagery (pleasant and unpleasant rural and urban scenes). Results indicated that all conditions significantly reduced participants’ blood pressure. Exercise alone produced positive effects on self-esteem and 4/6 of mood measures. Projection of pleasant scenery increased self-esteem, while projection of unpleasant scenes lowered the scores on 3/4 of the mood measures.

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**Citation:** Rangul, V., Bauman, A., Holmen, T. L., & Midthjell, K. (2012). **Is physical activity maintenance from adolescence to young adulthood associated with reduced CVD risk factors, improved mental health and satisfaction with life: The HUNT study, Norway.** *International Journal of Behavioral Nutrition and Physical Activity, 9*(144), 1-11. doi:10.1186/1479-5868-9-144


**Summary:** This study looked at whether different physical activity patterns from adolescence to young adulthood would be associated with later mental health and cardio-metabolic risk factors. The sample was comprised of 838 males and 1031 females, initially ages 13-19 and followed up with at ages 23-31. Both self-report and physical status measures were collected. Results indicated that individuals of both genders who maintained physical activity had fewer cardiovascular symptoms of concern. Males who maintained physical activity had a higher likelihood of good mental health than males who adopted physical activity later on. Females
who maintained physical activity reported a greater satisfaction with their lives than females who adopted physical activity later on.


**Link:** [https://bmcpublichealth.biomedcentral.com/articles/10.1186/1471-2458-7-155](https://bmcpublichealth.biomedcentral.com/articles/10.1186/1471-2458-7-155)

**Summary:** This study looks at the association between weekly hours of physical activity when teens were 15-16-years-old and their mental health three years later. The original sample consisted of 3811 teens and at follow-up 2489 individuals participated. A gender difference was noted, with the number of hours of weekly physical activity of boys at age 15-16 being negatively associated with emotional symptoms and peer problems at age 18-19 and no such relationship indicate for girls.


**Summary:** This study explored the relationship between physical activity and mental health in college undergraduates. The sample was comprised of 100 students in the UK who completed questionnaires relating to their levels of depression, anxiety, and physical activity. Results indicated better mental health in the students who engaged in more physical activity.

**JOURNALS**

**Title:** Mental Health and Physical Activity

**Link:** [http://www.sciencedirect.com/science/journal/17552966](http://www.sciencedirect.com/science/journal/17552966)

**Description:** This international journal is focused on scholarly work concerning the relationship between mental health and physical activity. It offers a forum for interdisciplinary exploration of the relationship between mental health and physical activity and seeks to promote and publish high quality research in the field.