

The relationship between organised recreational activity and mental health

Research: A review of current literature indicates that people who participate in sports clubs and organised recreational activity enjoy better mental health, are more alert, and more resilient against the stresses of modern living.

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A review of current literature indicates that people who participate in sports clubs and organised recreational activity enjoy better mental health, are more alert, and more resilient against the stresses of modern living. Participation in recreational groups and socially supported physical activity is shown to reduce stress, anxiety and depression, and reduce symptoms of Alzheimer’s disease. Violent crime also decreases significantly when participation in community activities increases.¹ More people undertake voluntary work for sports and physical recreation organisations in Australia (1.1 million) to support participation in sport and recreation activity, than are employed in the industry (83,008).² Links between obesity, depression and physical inactivity are also briefly examined.

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Infographic above: Being physically active: protects against mental health problems, decreases depression in older adults, reduces the symptoms of post natal depression, is as effective as medication for mild to moderate anxiety and depression, improves self-esteem and cognitive function in young people, playing sport reduces psychological distress by 34% 1-3 times a week and 46% 4+ times a week, people who participate in sports clubs and organised recreational activity enjoy better mental health.



Physical activity and mental health

Community sport and recreation



Source: DSR 2017 Community Perceptions Survey

#OurWholeCommunityWins

Infographic above: Physical activity and mental health: Community sport and recreation.

- Around 8 in 10 Western Australians believe it's important for sport and active recreation to help us feel good about ourselves and build our confidence and self-esteem.
- More than 8 in 10 Western Australians feel it's important and agree that sport and active recreation creates close friendships.
- More than 8 in 10 Western Australians feel it's important that sport and active recreation involve people like coaches who can have a positive impact on children's lives.

Source: DSR 2017 Community Perceptions Survey

Links between group activities and mental health

Participation in sport and recreation activities can reduce stress, anxiety and depression.³ Participation in group recreation provides a sense of value, belonging and attachment.⁴ According to Bandura's social cognitive theory, behaviour is shaped by the interaction between individual and environmental factors.⁵ This theory emphasizes the influence of social interaction in relation to behaviour. There are both direct and indirect links between participation in group activity and mental health.

Direct links

Numerous studies and reviews demonstrate associations between social interaction and mental wellbeing.⁶⁻¹⁵ The Whitehall Study in the United Kingdom found that people without good social support were five times more likely to have a mental illness than those with good support.⁶ There were significant associations between social isolation and low mental health scores in a cross section of the population in

rural and regional Victoria.⁸ There were similar findings in a random sample of the population in suburban Adelaide.⁷ A significant association between depression and loneliness has been found in middle to older age adults in the United States, using both cross-sectional and longitudinal analyses.¹⁵ A prospective cohort study into psychosocial factors and mortality in Norway found that both social participation and social support are predictors of a long life, and social support helps in the handling of stressful life situations.⁹ An evidence-based intervention strategy designed for older adults in the USA advocates social participation as a means to maintain cognitive vitality.¹⁴ The Mayo Clinic in Rochester, Minnesota, USA recommends joining a community group or becoming a volunteer in order to buffer the effects of stress.¹⁶ Another benefit to community wellbeing is shown in a study by the Australian Institute of Criminology in which a ten percent increase in community participation was related to a statistically significant 1.9% decline in violent crime rates.¹ A decrease in criminal behaviour can lead to a further increase in social participation as people feel safer in their community environment.¹⁷ The Australian Government promotes social participation and social capital in the Stronger Families and Community Strategy.¹⁷

Indirect Links

Extensive evidence shows that social participation and social support increases participation in physical activity^{18, 19} and engagement in physical activity is strongly associated with mental health.^{7, 8, 20-29} Evaluations have shown that social support such as “buddy” systems increases feelings of well-being and people’s intention to begin or continue participating in physical activity.^{10, 18, 30, 31} A study of older adults showed that these positive effects were highest amongst subjects with high baseline self-efficacy and in those who exercised more frequently.²⁰ However, those with lower baseline self-efficacy showed a greater upward trend over six months, which was attributed to the creation of “buddy groups” within the program. The National Heart Foundation’s ‘Just walk It’ program identified social cohesion as the main predictor of adherence to walking programs and as an important component for creating positive attitudes toward physical activity.¹⁰ The 2003 Child and Adolescent Physical Activity and Nutrition Survey in Western Australia identified one of the barriers to participation in physical activity as “no one to be active with”.³² A recent review of dog ownership literature suggests that “buddies” need not be limited solely to the human variety, as the social support gained from dogs was also shown to encourage increased physical activity.³³

Recent research also indicates an association between obesity and depression.^{34,35} Many depressed persons are inactive and gain weight and physical activity is listed as a potential mediating variable for depression.³⁵ Participation in recreational groups and socially supported physical activity assists people to initiate and sustain physical activity programs. Decreased physical activity amongst children and adolescents is believed to have contributed to the prevalence of overweight and obesity doubling in the past two decades.³⁶ There is clear evidence of the benefits of physical activity in preventing and treating obesity.^{37, 3}

Current Trends in Australia

Mental health

Australia spent a total of \$3.3 billion on mental illness in 2003, 6.6 percent of the total cost of health care.³⁹ Depressive disorders are one of the major causes of disability in Australia affecting about six percent of the population in any one year.⁴⁰ Certain population groups appear to be more at risk than others: Indigenous people, culturally and linguistically diverse (CALD) people, people with disabilities, adolescents, postnatal women and the elderly.⁴⁰ The 2001 National Health Survey showed that people with mental and behavioural problems were twice as likely to be hospitalised as those without these problems.³⁶ Strategies aimed at enhancing mental health and wellbeing in the community therefore have the potential to decrease the social and economic costs associated with mental illness. The 2000 National Action Plan for Depression includes recommendations for social support, but does not specifically address the need for physical activity or social recreation as a preventive or curative measure.⁴⁰ The first objective of Key Initiative 6 of the Western Australian Mental Health Action Plan 2005-2010 is “to strengthen community capacity to promote mental health and prevent mental illness, including increasing cross sectoral collaboration and community development”.⁴¹

Social participation and support

The Australian Bureau of Statistics reported that participation in social activities declines with age, and 4% of people aged 18-24 years report no social or sporting participation in a three month period compared with 21% of those over 75 years.¹⁷ The 2003 Survey of Disability showed that few people with profound or severe core-activity limitation (14 and 10% respectively) ever attend supervised activity programs in a safe environment.¹⁷ This includes group activities at day care centres for older people. VicHealth, the peak body for health promotion in Victoria, supports community organisations through its Active Participation Grants.⁴² Participation by a diverse range of organisations creates opportunities for people who would not normally be involved in traditional sporting activity. An area in which many Australians actively participate is volunteering. Much of the volunteer work undertaken relates to parent’s involvement with their children’s sporting activity.¹⁷ A recent study by the Institute of Psychiatry at Kings College London indicates that volunteering can help boost the recovery of people who experience mental disorders, and help regain entry into employment opportunities.⁴³

Physical activity

Physical inactivity is second only to tobacco as a contributing factor to the burden of disease and injury in Australia.⁴⁴ Regular physical activity is widely recognised as protective against the overall burden of disease.³⁷ In 2002, more than a third (37.6%) of adult Australians reported no participation in sports and physical recreation.² Approximately half of the remainder (31.5%) participated in organised sports and physical recreation, with a further 30.9% reporting that they undertook some form of physical activity.² For both males and females, walking was the most popular form of recreational physical activity.² Approximately 40% of children do not participate in organised sporting activity outside of school.²

Summary

The relationship between participation in organised sport, recreation and mental health is shown in Figure 1. Studies and reviews cited in this review are summarised in Tables 1 and 2. A number of themes were consistent across the literature:

- Social support, social networks and social cohesion provided by group activities enhance the mental health and wellbeing of a community.⁶⁻¹⁴
- Substantial evidence is shown for the correlation between social support and increased and continued participation in sport and active recreation.^{10, 12, 13, 18, 28, 29, 31, 45, 46}
- Physical activity has been shown to enhance feelings of well-being in various population groups.^{20, 22, 24, 25, 27, 46, 47} A possible physiological mechanism for feelings of well-being could be the release of endorphins during exercise.⁴⁸
- Cognitive function in elderly people with or without Alzheimer's disease is associated with maintaining an active, social lifestyle.^{13,29} The hypothesis that physical activity alleviates cognitive decline is supported.²⁹
- Participation in fitness and activity programs correlates positively with feelings of self esteem.^{27, 32, 47}
- Significant decreases in incidence and prevalence of clinical depression following physical activity interventions were shown in a number of settings.^{11, 21, 23, 24, 27, 28}

Limitations

Research relating to the relationship between participation in organised sport and risk-taking behaviour has had mixed results. While sport participation is shown to have mostly positive behavioural effects^{26,47} a few studies have shown greater risk-taking behaviour such as alcohol and other substance use amongst those participating in organised sport.^{47, 49} Two other limitations of this review are the reliance on cross-sectional studies, which are unable to exclude confounders and prove a causal relationship, and the use of grey literature. However extensive reviews in international literature support the mechanisms for the relationships between organised sport and recreation and mental health shown in Figure 1.^{22, 30-32, 36, 37}

Conclusion

Participation in organised sport and recreation can be a preventative and curative strategy to promote positive mental health and combat mental illness. The recommendations of this review support the development and maintenance of organised sport and recreational activities in the community. These programs should be socially and culturally appropriate and should take into account mediating factors that increase adherence to physical activity programs. They should Participation in organised sport and recreation Improved physical and mental health and well-being Reduction of obesity Social support Social networks Social cohesion Social capital Cognitive function 6 extend to diverse population groups including those most at risk of developing mental health problems. Valid and reliable evaluations of the programs would contribute to the international body of evidence relating to the mental health benefits of organised group activities. Government sectors must work together to support a diverse range of organised recreational activities to promote increased social support and social capital in the population as proposed in both State and Federal Action Plans relating to mental health.^{40, 41}

Table 1: Intervention and Cross-Sectional Research; Relationship between sporting group participation, exercise programs and/or social networks, and mental health

Steiner et al²⁶ 2000 Stanford University

- **Study design:** Cross-sectional Survey
- **Sample:** 1769 urban Californian students
- **Methods:** Juvenile Wellness and Health Survey
- **Measures:** General risk taking Mental health problems Sex-related risks Eating and Dietary problems General Health problems
- **Results:**
 - In girls reported risk-taking was significantly lower in those who participated in sports.In boys no difference was shown
 - Sports participation was associated with fewer mental health problems
 - Sports participation was associated with fewer eating and dietary problems
- **MH:** +
- **Recommendations/conclusions:**
 - Adolescents should be encouraged to become active in order to manage their well-being
 - A more diverse range of students should be studied

Table 2: Research Reviews; Relationship between Participation in Sport/Physical Activity Levels and/or social networks, and Mental Health

Lovden et al In Press²⁹ Saarland University, Germany University of Geneva

- **Studies included:** 62 papers relating to old age and cognitive decline
- **Methods/presentation of literature:** An examination to determine whether active lifestyles in old age alleviate cognitive decline or whether cognitive functioning increases the possibility of engaging in an active lifestyle, or both
- **Results:** Support the hypothesis that an active lifestyle alleviates cognitive decline, but not the reverse
- **Ass:** +
- **Recommendations:** Maintaining an active lifestyle attenuates decline in perceptual speed

Hui & Rubenstein²⁸ 2006 University of California Los Angeles

- **Studies included:** 55 papers addressing barriers and enablers for elderly people to participate in physical activity
- **Methods/presentation of literature:** An examination of correlates of inactivity in sedentary older persons
- **Results:**
 - Regular physical activity is associated with decreased levels of depression and anxiety
 - Self-efficacy and group programs were included in the enablers

- Some studies found that self efficacy and not social support was important for adherence to physical activity prog
- **Ass:** N/A
- **Recommendations:**
 - Subjects need to be educated and motivated
 - Goal setting provides participants with incentives
 - Involvement of family and caregivers can facilitate the process

Jobling⁴⁵ 2001 University of Queensland

- **Studies included:** 2 programs relating to inclusion contrasted with those designed to meet perceived special needs
- **Methods/presentation of literature:** Examination of physically active recreation within lives of those with Down syndrome
- **Results:** Suitable tools helped teachers to examine interactions and apply strategies to enable participation by subjects with Down syndrome in community-based physical activity
- **Ass:** N/A
- **Recommendations:** Differences should be viewed as opportunities. Community-based programs for people with disabilities should be initiated through mainstream sport and recreation

Kanters & Tebbutt⁴⁷ 2001 North Carolina State University

- **Studies included:** 13 studies related to social and psychological outcomes cited in a rationale for Fitness and Active Lifestyle Program
- **Methods/presentation of literature:** Review of literature relating to social and psychological benefits of participation in sport
- **Results:**
 - Positive benefits include self-esteem, better life-skill development, greater family communication, decreased risky behaviour and increased academic achievement
 - Some studies found increased participation in alcohol and other drug use
 - The environment in which sport takes place relates to the outcomes of sport participation
 - Parents play a critical role in creating a quality sporting experience
- **Ass:** + & -
- **Recommendations:** Parents should be included in the planning and implementation of sports programs for children and adolescents

World Health Organisation²⁷ 2004

- **Studies included:** 10 of 160 papers related specifically to psychological effects of physical activity on children and adults
- **Methods/presentation of literature:** A review of transport related health impacts, costs and benefits including the psychological effects of physical activity on children
- **Results:**
 - Mood-enhancing effect
 - Increased self-esteem
 - Emotional well-being correlates with participation in sports and physical recreational activity

- Those who are physically active are less likely to have mental health problems
- **Ass:** +
- **Recommendations:**
 - The journey to and from school offers an opportunity for increasing physical activity
 - Suitable evaluation tools need to be developed for walk and bike to school programs

McCreynolds & Rossen 2004 Wabash Valley Hospital, Indiana University of North Carolina at Greenboro, NC

- **Studies included:** 44 papers relating to nutrition, physical activity and social support for older adults
- **Methods/presentation of literature:** A review as a rationale for a health promotion program for older adults, presented with recommended strategies
- **Results:** Older adults who participated in community group activities and/or did volunteer work had greater cognitive vitality than those with fewer relationships and less social engagement
- **Ass:** +
- **Recommendations:**
 - Improve well-being, entertainment, and social relations with an active lifestyle
 - Reduce social isolation by increased participation in community recreation
 - Incorporate social support in health education that is suitable to particular cultural groups
 - Increase physical activity to help maintain cognitive function

Emily B. Kahn Leigh T. Ramsey Ross C.; Brownson Gregory W. Heath Elizabeth H. Howze Kenneth E. Powell Elaine J. Stone Mummy W. Rajab Phaedra Corso The Task Force on Community Preventive Services 19 2002 Centers for Disease Control and Prevention, Atlanta, GA St Louis University School of Public Health, St Louis, Missouri Agency for Toxic Substances and Disease Registry, Atlanta, GA Georgia Dept of Human Resources, Atlanta, GA National Institutes of Health, Bethesda, Maryland

- **Studies included:** 156 papers covering interventions and reviews relating to a range of factors that potentially increase physical activity, including social support interventions
- **Methods/presentation of literature:** Each type of intervention was addressed under the following headings:
 - Effectiveness
 - Applicability
 - Other positive and negative effects
 - Economic Barriers to intervention implementation
 - Conclusion
- **Results:**
 - Social support interventions are effective in increasing levels of physical activity, as measured by an increase in number participating, energy expenditure and other measures of physical activity
 - No barriers were identified
- **Ass:** +

- **Recommendations:** The creation of improved access to sport and recreational activity combined with outreach activities is effective in increasing participation in physical activity

McNeill, Kreuter & Subramanian¹⁸ 2006 Harvard School of Public Health Health Communication Research Laboratory, Saint Louis University School of Public Health

- **Studies included:** 112 published papers and academic texts were reviewed
- **Methods/presentation of literature:** Five dimensions of the social environment are identified:
 - Social support and social networks
 - Socio-economic position and income inequality
 - Racial Discrimination
 - Social cohesion and social capital
 - Neighbourhood factors
- **Results:**
 - Social capital and social cohesion influence a broad spectrum of health related behaviours including participation in physical activity
 - Increased physical activity with increased social support
 - Poverty is associated with poorer health and lower uptake of physical activity.
 - Provision of health-promoting services such as parks and recreational facilities are reduced in areas of economic and social deprivation.
 - The availability of recreational facilities in a neighbourhood is a limiting factor in activity behaviour
- **Ass:** +
- **Recommendations:** Decisions about programs and policies to promote physical activity should take into account five dimensions of the social environment:
 - Social support and social networks
 - Socio-economic position and income inequality
 - Racial Discrimination Social cohesion and social capital
 - Neighbourhood factors

Steptoe & Butler²⁵ 1996 University of London City University, London

- **Study design:** Cohort Study
- **Sample:** 5061 Adolescents (2223 boys 2838 girls) in England , Scotland and Wales
- **Methods:** Analysis of data taken from a follow-up survey in a prospective cohort study
- **Measures:**
 - Emotional wellbeing in a general health questionnaire
 - Sports participation
 - Social class
 - Health status
- **Results:** increased participation in vigorous sports associated with decreased emotional distress
- **MH:** +
- **Recommendations/conclusions:** Promoting active lifestyles may help adolescents develop long term positive health habits

Brown et al.²⁴ 2005 University of Queensland

- **Study design:** Prospective Cohort Study
- **Sample:** 9207 middle-aged women in Queensland
- **Methods:** Cross-sectional and prospective data from a population-based cohort using 3 mailed surveys
- **Measures:** Time spent in walking, moderate and vigorous intensity physical activity Measures of psychological health including Centre for Epidemiological Studies Depression scale
- **Results:**
 - Mental health scores were higher and depression scores lower with increased physical activity
 - Depressive symptoms decreased when subjects increased their physical activity
- **MH:** +
- **Recommendations/conclusions:** Promoting low to moderate levels of physical activity may be an important means of decreasing depressive symptoms amongst middle-aged women

Dunn et al²³ 2005 Cooper Institute, Behavioural and Research Centre, Golden, Colorado University of Texas Cooper Institute, Centers for Integrated Health Research, Dallas, Texas Alberta Children's Hospital

- **Study design:** Randomised 2x2 factorial design with placebo control (blinded)
- **Sample:** 80 men and women aged 20 – 45 years with mild to moderate major depressive disorder in Texas
- **Methods:** Random assignment to four intervention groups or control group
- **Measures:** Hamilton Rating Scale for Depression
- **Results:**
 - Depression scores were significantly lower for energy expenditure
 - There was no significant difference for exercise frequency at 12 weeks
- **MH:** +, 0
- **Recommendations/conclusions:** Aerobic exercise at doses equivalent to 17.5 kcal/kg/week 5 days a week is an effective treatment for depression

Babyak et al¹¹ 2000 American Psychosomatic Society

- **Study design:** Program evaluation
- **Sample:** 156 adults with major depressive disorder in North Carolina
- **Methods:** Random assignment to 3 experimental groups (treatment by medication, exercise or both)
- **Measures:**
 - Beck Depression
 - Inventory
 - Diagnostic Interview
 - Schedule Diagnostic and Statistical
 - Manual of Mental Disorders IV
- **Results:**
 - After 4 months all three groups exhibited significantly less depression
 - After 10 months subjects in the exercise group exhibited significantly lower relapse rates
- **MH:** +

- **Recommendations/conclusions:** A modest exercise program is an effective treatment for people with major depressive disorder

Kwak et al¹⁰ 2006 Maastricht University, The Netherlands The National Heart Foundation, Brisbane Erasmus Medical Center, The Netherlands

- **Study design:** Program evaluation
- **Sample:** 284 walking program participants in Queensland
- **Methods:** Attendance records Survey
- **Measures:**
 - Attendance Cognitive factors
 - Social environment Physical environment
 - Socio-demographic variables
- **Results:**
 - The sole predictor of adherence was social cohesion
 - Cohesion was positively associated with positive attitudes
 - Positive attitudes were greater amongst participants who perceived their neighbourhood to be safe and friendly
- **Recommendations/conclusions:**
 - The importance of both physical and social environments must be considered when planning walking group interventions
 - People with things in common may adhere to groups more than those with different interests and/or backgrounds

Bicycle Victoria³¹ 2006

- **Study design:** Program evaluation
- **Sample:** 150+ men and women aged 45 years and over in Victoria
- **Methods:** Participation records Self-completed questionnaire
- **Measures:**
 - Percentage increase in participation
 - Questionnaire (qualitative + quantitative): Addressed cost, confidence, skills and knowledge, motivation, social support, and intention to continue riding
- **Results:** Participation increase from 25% to 100% of participants. Helpful elements were: affordability + social support
 - Benefits:
 - confidence up
 - skills and knowledge up
 - motivation up
 - Intention to continue:
 - Yes 94%
 - Unsure 6%
 - No 0%
- **MH:** +
- **Recommendations/conclusions:**
 - Recognise importance of social element in starting and maintaining bike riding.
 - Recognise the motivators of fitness, affordability, meeting others, and fun

McAuley et al²⁰ 2005 University of Illinois at Urbana-Champaign John

Hopkins University School of Public Health University of Massachusetts

- **Study design:** Randomized controlled trial
- **Sample:** 174 sedentary men and women aged 60 – 75 years in Illinois
- **Methods:** Stratified random samples allocated to aerobic or non-aerobic activity for six months
- **Measures:**
 - Demographics, health and physical activity history
 - Aerobic endurance capacity
 - Self-efficacy
 - Social support during exercise Importance of physical activity
 - Physical activity feeling states
 - Exercise behaviour
- **Results:**
 - Growth curve for Positive Wellbeing was positive and significant
 - There were higher levels of wellbeing for those who were more self-efficacious at baseline, those who exercised more frequently and those with more exercise-related social support
 - Linear upward trend was greater for those with lower baseline self-efficacy
- **MH:** +
- **Recommendations/conclusions:** Exercise environment that maximises feelings of self-efficacy may enhance feelings of wellbeing in older adults

Bennett et al¹³ 2006 Rush Alzheimer's Disease Center, Rush University Medical Center

- **Study design:** Longitudinal, epidemio-logical clinicopathological cohort study
- **Sample:** 89 elderly people without known dementia in Chicago
- **Methods:** Annual clinical evaluation, brain autopsy at time of death, structured interview for data relating to social networks
- **Measures:** Disease pathology, cognitive function and social network data
- **Results:** Subjects with good social networks had better cognitive function than those with similar physiological symptoms of Alzheimer's who did not have such networks.
- **MH:** +
- **Recommendations/conclusions:** Promote social connections in the elderly

Reijneveld et al²² 2006 Netherlands Organisation for Applied Scientific Research

- **Study design:** Group randomized controlled trial
- **Sample:** 126 Turkish immigrants in the Netherlands aged 45 and over
- **Methods:** Random group assignment to eight two-hour sessions of health education and exercises or control programme of "Ageing in the Netherlands"
- **Measures:**
 - Physical and mental wellbeing
 - Mental health based on the SF-12/36
 - Knowledge on health and disease
 - Physical activity
- **Results:** Participants in intervention group showed significant improvement in mental health, but no improvement in physical wellbeing, physical activity, or knowledge

- **Recommendations/conclusions:** To have positive outcomes, contents and method of delivery must be adapted to be culturally suitable to the target group

Crone et al¹² 2005 University of Gloucestershire York St Johns College University of Leeds

- **Study design:** Qualitative investigation
- **Sample:** 18 subjects without diagnosis of mental illness from two leisure centres and a private health club in England
- **Methods:** Focus groups and semi-structured interviews pre and post exercise referral schemes
- **Measures:** Open, axial and selective coding QSR NUD*IST 4 computer program used to analyse qualitative material
- **Results:**
 - Importance of social support and physical environment for elicitation of positive experiences.
 - Three outcomes emerged:
 1. A sense of belonging
 2. A sense of purpose
 3. Physical health
- **Recommendations/conclusions:** Fitness instructors should attach meaning to the experiences that people have whilst exercising

Driscoll⁴⁶ 2003 RMIT University Victorian Government

- **Study design:** Program evaluation
- **Sample:** 72 people identifying as disadvantaged in Victoria participating in RecLink
- **Methods:** Self reporting survey of participants
- **Measures:** Personal profiles Types of physical and mental disorders mental Qualitative responses of self-transformation
- **Results:**
 - Promotion of social, physical and mental well-being in disadvantaged people
 - Development of individual coherence, confidence and social connectedness
- **MH:** +
- **Recommendations/conclusions:** Public policy areas need to adopt diverse approaches to social inclusion

Heath et al^{50, 51} 2004 & 2006 Townsville Aboriginal and Islanders Health Services

- **Study design:** Self-selected prospective cohort study
- **Sample:** 144 overweight Indigenous people in Townsville, Queensland
- **Methods:** Physical activity questionnaire Pedometer readings Well-being survey Assessment by general practitioner 24 hour nutritional recall survey
- **Measures:** Physical activity Number of steps taken Well-being Physiological measures Recommended food intake
- **Results:**
 - Participation in recreational walks increased from 37% to 61%
 - Significant increase in number of participants doing moderate and vigorous exercise

- Significant increase in wellbeing scores
- **MH:** NA
- **Recommendations/conclusions:** There is an urgent need for culturally appropriate lifestyle modification programs that involve low impact exercise

Savage, Bailey & O'Connell⁸ 2003 Deakin University

- **Study design:** Cross-sectional study
- **Sample:** 1752 adults randomly selected from the electoral roll in regional and rural Victoria, Australia
- **Methods:** Postal, self-completed survey
- **Measures:**
 - Physical and mental health (SF-12 scale)
 - Demographic characteristics
 - Participation in social, sports, leisure or support activities
- **Results:** Low participators were more likely to be older, have low income and lower scores for physical and mental health
- **MH:** +
- **Recommendations/conclusions:** Promoting people's engagement with and involvement in their local community can promote the wellbeing of the whole community

The Premier's Physical Activity Taskforce³² 2004 University of Notre Dame Australia

- **Study design:** Cross-sectional study
- **Sample:** 2880 Western Australian children and adolescents
- **Methods:** Physical activity questionnaire 7-day pedometer diary
- **Measures:** Reported physical activity participation and attitudes Number of steps taken
- **Results:**
 - 89.7% metro and 82.7 non-metro reported physical activity increased their self-esteem
 - Links between social benefits and physical activity shown by 66.9% of secondary males and 56.0% of secondary females
 - Barriers included lack of self efficacy, especially for secondary females, and lack of parks and sports grounds
- **MH:** +
- **Recommendations/conclusions:** Increase skills and capacity of community sport and recreation service providers to target children's needs Promote opportunities for physical activity emphasizing participation by female secondary students

Brosnahan et al²¹ 2004 University of Minnesota Corpus Christi Nueces County Public Health District

- **Study design:** Cross-sectional study
- **Sample:** 1870 Hispanic and non-Hispanic white adolescents in Texas
- **Methods:** Modified 2001 Youth Risk Behaviour Survey
- **Measures:** Moderate and vigorous physical activity, strength and toning, total physical activity, participation in team sports, feelings of sadness and considering, planning and attempting suicide
- **Results:**

- Greater attendance in physical education class was inversely related to feelings of sadness
- Participation in more total PA sessions per week was associated with lower risk of considering suicide
- Higher levels of vigorous activity were associated with a lower risk of planning suicide
- **MH:** +
- **Recommendations/conclusions:** Physical activity can be used in strategies to holistically improve the health of adolescents

Cacioppo et al¹⁵ 2006 University of Chicago

- **Study design:** Cross-sectional study and longitudinal study
- **Sample:** Study 1 – 2193 middle-aged to older adults, representative of US population Study 2 – 212 adults aged 50-67 years in Cook County, Illinois
- **Methods:**
 1. One hour telephone interview
 2. Full day annual testing in a laboratory
- **Measures:**
 - Loneliness scale
 - Depressive symptomatology CES-D scale for depression
 - Demographic variables
 - Psychosocial risk factors (perceived stress, social support and hostility)
- **Results:** Loneliness was associated with depressive symptoms in both studies
- **MH:** NA
- **Recommendations/conclusions:** Loneliness and depression act synergistically to diminish well-being in older adults

Dalgard & Haheim⁹ 1998 National Institute of Public Health

- **Study design:** Prospective Cohort Study
- **Sample:** 1010 adults randomly selected from different neighbourhoods in Oslo, Norway
- **Methods:**
 - Initial data from structured interviews
 - Follow-up on mortality and cause of death was from the Central Bureau of Statistics
- **Measures:**
 - Psycho social variables including social support, social participation and locus of control
 - Demographic and biological factors Mortality and cause of death
- **Results:**
 - Lack of social participation was the most powerful predictor of mortality
 - Poor social support combined with external locus of control increased the risk of developing a mental disorder when exposed to negative life events
- **MH:** +
- **Recommendations/conclusions:** Social support and social participation combined with locus of control are equally important in stressful life situations

Baum et al⁷ 2000 Flinders University University of Queensland South Australian Community Health Research Unit University of Technology,

Sydney Women's and Children's Hospital, Adelaide

- **Study design:** Cross-sectional study
- **Sample:** 2542 adults randomly selected from the western suburbs of Adelaide, South Australia
- **Methods:** Postal, self-completed survey
- **Measures:**
 - Participation in a range of social activities
 - Demographic characteristics
 - Physical Health Mental Health Social isolation
- **Results:** Less social interaction in both physical and non-physical activities correlated with poorer mental health and high social isolation
- **MH:** NA
- **Recommendations/conclusions:** Stronger partnerships between existing community organisations and groups could benefit both the groups and the health services

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