



Inaugural editorial

Welcome to this new inter-disciplinary journal which we hope will appeal to readers from a wide range of backgrounds. We have collectively over 30 years of experience in this field and felt that the time was right to bring so many related areas of research together in one publication. The journal is not affiliated to any one organisation or academic society but has one primary aim: to enhance our understanding of the relationship between body and mind for the benefit of those who experience or may experience mental health problems.

1. History

The body–mind connection has re-captured scientific interest in recent years with at least 12 academic books (Acevedo & Ekkekakis, 2006; Biddle, Fox, & Boutcher, 2000; Faulkner & Taylor, 2005; Fox, 1997; Leith, 1994, 1998; McDonald & Hodgdon, 1991; Morgan, 1997; Morgan & Goldston, 1987; Rankin, 2002; Sachs & Buffone, 1984; Seragianian, 1993), several Special Issues in journals, and at least one international conference, largely devoted to the link between physical activity and mental health. The number of manuscripts published on the topic in peer reviewed journals has increased from less than 10 in 1986, to about 20 in 1996, and well over 100 in 2006, based on a crude search of Medline using the words: exercise mental health (year). In part this reflects the growth of material available through just this one search engine but there have been undisputable changes in the scope of interest which will be discussed later in more detail. The last 20 years has also seen the rapid development of a bibliographic science that facilitates access through the Internet to 'knowledge'. We have been involved in a number of systematic searches on the effects of physical activity on different dimensions of mental health, and there are undoubtedly issues in this emerging science with respect to input and output. Physical activity encompasses so many aspects of life and behavioural patterns among human and animals that there is a danger that important insight can be lost in this sea of information. The science behind understanding the link between mental health and physical activity therefore spans a potentially broad field from neuroscience to implementation science, across many different dimensions of mental health and psychological well-being. This is the first international peer reviewed journal that provides such a focus on the relationship between mental health and physical activity, the promotion of physical activity for mental health benefits and the influence of mental health on physical activity.

2. Why is Mental Health and Physical Activity so important?

Fox, Boutcher, Faulkner, and Biddle (2000) outline five reasons why physical activity may be an effective mental health promotion

strategy. First, physical activity is potentially cost-effective – it is relatively inexpensive to deliver as an intervention and to participate in. Second, in contrast to pharmacological interventions, physical activity is associated with minimal adverse side-effects. Third, physical activity can be indefinitely sustained by the individual unlike pharmacological and psychotherapeutic treatments which often have a specified end-point. Fourth, many other non-drug treatments (such as cognitive behavioural therapy) are expensive and therefore often in short supply while some patients report a reluctance to take medication (e.g., Givens et al., 2006). Physical activity may be a cost-effective alternative for those who prefer not to use medication or who cannot access therapy. For example, although regional variations exist, the total waiting time for psychiatric treatment in Canada may be as much as *five* months, which is nearly three times longer than specialists feel is appropriate (Esmail & Walker, 2005). Is there a role for physical activity in addressing this delay in specialist treatment, and if so, what is the most effective way to promote physical activity, in either a structured form or through self-help (and counseling) for people with mental health problems? Finally, regardless of whether physical activity provides a psychological benefit, it has clear physical health benefits and should therefore be promoted on this basis. Physical activity stands apart from more traditional treatments and therapies for mental health problems because it has the potential to simultaneously improve health and well-being *and* tackle mental illness. We use physical activity as a general term that refers to any movement of the body that results in energy expenditure above that of resting level (Caspersen, Powell, & Christenson, 1985). Exercise is often [incorrectly] used interchangeably with physical activity but this term refers to a subset of physical activity in which the activity is purposefully undertaken with the aim of maintaining or improving physical fitness or health. Examples of exercise include 'going to the gym', jogging, brisk walking (specifically for health benefits), taking an aerobics class or taking part in recreational sport for fitness. Sport usually involves an element of competition and structure, with achievement goals that may or may not include health maintenance or gain. Evidence that physical health benefits can be gained from regular low-to-moderate intensity activity resulted in new public health guidelines, and challenges to demonstrate that psychological benefits can also be gained from such a dose, in the context of a global shift to more sedentary lifestyles. We have deliberately titled the journal to include reference to 'physical activity' rather than exercise to ensure the scope of the journal includes but goes beyond a focus on the effects of structured exercise on mental health outcomes.

The growth in academic output and practitioner interest in physical activity in the prevention and treatment of illness is hardly surprising given the spiralling costs of pharmacological treatments

for mental illness, and endemic personal suffering. We have an ageing population in many western and developing countries with increasing neuropsychological disorders. Among young people, there is a challenge to prevent and treat substance misuse and reverse trends in the prevalence of suicide. Workplace stress contributes enormously to personal and organisational dysfunction. Depression is the leading cause of disability as measured by Years Lived with Disability, and is expected to move from 4th to 2nd (by 2020) as the leading contributor to the global burden of disease, in terms of Disability Adjusted Life Years, for all ages, and both sexes (Lopez & Murray, 1998). In high income countries it is expected that depression will be the leading cause of disease burden in both 2015 and 2030 (Mathers & Loncar, 2005). This and many other dimensions of mental health have been linked in some way to physical (in)activity. There is also an increasing awareness of how mental illness and low psychological well-being, and pharmacological treatments influence physical activity. Mental health problems are often co-morbid with physical health problems such as coronary heart disease, cancer, diabetes, obesity, coronary obstructive pulmonary disease, HIV, neurological disorders, and backpain (Steptoe, 2006). It is clear that adapted physical activity may enhance the quality of life of people with both mental and physical health problems (Faulkner & Taylor, 2005).

People with mental health problems and illness can find the challenge to be physically active and avoid weight gain to be insurmountable. Inactivity can be symptomatic of their condition, for biological and psycho-social reasons. The effects of physical activity interventions on such mediating factors in the link with mental health are important to understand for the optimal design of theoretically driven interventions. So many research questions come to mind in this field which have barely been considered. Policy makers want to know, does physical activity impact on dimensions of mental health? Practitioners want to know how such effects may occur, and in what circumstances and with which populations, in order to tailor their interventions to optimal effect? Researchers need to know which designs and methods to use, and how to engage with and protect the needs of often vulnerable populations. Training providers want to pass on accessible information, and know how best to influence the promotion of physical activity for mental health benefit among the practitioners with whom they work. *Mental Health and Physical Activity* will be a central forum for tackling such questions.

3. Aims of Mental Health and Physical Activity

The aims of this new journal, *Mental Health and Physical Activity*, are summarised below but we thought it would be useful to comment on them in this first issue in relation to the scope of manuscripts we are seeking to publish.

- (1) To foster an inter-disciplinary development and understanding of the field of physical activity and mental health;
- (2) To foster the development of research designs and methods to advance our understanding;
- (3) To promote the publication of high quality research on the effects of physical activity (interventions and a single session) on a wide range of dimensions of mental health and psychological well-being (e.g., depression, anxiety and stress responses, mood, cognitive functioning and neurological disorders, such as dementia, self-esteem and related constructs, psychological aspects of quality of life among people with physical and mental illness, sleep, addictive disorders, eating disorders), from both efficacy and effectiveness trials;
- (4) To promote high quality research on the bio-physical and psycho-social mechanisms involved to help our understanding

of the link between physical activity and mental health, and guide intervention development;

- (5) To provide an evidence-based source for professionals working in the field of mental health (e.g., policy makers, psychiatrists, health and clinical psychologists, public health professionals, mental health workers and counsellors, exercise professionals, occupational health workers).

3.1. Inter-disciplinary development and understanding

As we move into the 21st century we have access to new technologies, animal models, and research paradigms, and a need to address pragmatic and policy issues in the promotion of physical activity for mental health. Older and emerging cognitive and behavioural therapies, delivered by clinical psychologists often run parallel and occasionally integrate their approaches with the promotion of physical activity, and there is scope to bring together therapies, therapists and bio-behavioural and social scientists. We have new questions that are more closely linked to the challenges of promoting public mental health. In the new era of evidence-based practice, questions about cost-effectiveness have rapidly become important and cannot be separated easily from questions about efficacy and mechanisms. The acceptance that mental and physical health is associated with socio-demographic, economic and environmental factors, and emerging evidence that genotype may well be important, provides challenges to understand how physical activity interventions can enhance psychological well-being for all segments of the population and communities.

In terms of research, there is a long continuum (or several undefined dimensions) from research with animals on neuroanatomical and biochemical changes (associated with enhanced cognitive and emotional functioning) in response to exercise to promoting social functioning (as a component of mental health) through exercise interventions. Inter-disciplinary research among scientists across the spectrum of research disciplines seeking to promote physical activity is critical. Technological and methodological advancements in the measurement of physical activity (e.g., accelerometers), mental health outcomes (e.g., with hand held devices and experience sampling methods), moderating factors (e.g., genotypes), and possible mediating processes (e.g., neuroimaging) are opening up new possibilities for the development of our understanding of the relationship between physical activity and mental health and require a greater cross-fertilization of relevant expertise. As La Forge (1995, p. 28) suggested in the context of mechanisms:

“The mechanism is likely an extraordinary synergy of biological transactions, including genetic, environmental, and acute and adaptive neurobiological processes. Inevitably, the final answers will emerge from a similar synergy of researchers and theoreticians from exercise science, cognitive science and neurobiology.”

We anticipate that researchers from many different backgrounds will submit manuscripts. In doing this, we hope the journal will contribute to an in-depth and comprehensive understanding of the field and foster the development of new avenues for research.

3.2. Development of research designs and methods

The journal will be an international forum for high quality scholarly reports, broadly defined, applying the most appropriate methods for answering the questions posed (i.e., diverse approaches, including both quantitative and qualitative methods). Systematic reviews using structured protocols, methodological

papers describing novel and state of the art approaches to understanding physical activity and mental health, and empirical research will be considered. We will welcome neurobiological animal research when there are clear links made to implications for the relationship between physical activity and mental health at the human level. Unless there is clear justification, studies involving convenience samples (e.g., healthy students) may not be viewed favorably. The methods should be described in sufficient detail for readers to synthesise the findings and replicate (or advance) the research.

We expect to receive reports of studies that have involved parallel-group randomised trials and would like to guide authors to the CONSORT international guidelines (www.consort-statement.org). While randomised trials may be most suited to supporting causal relationships between variables, how the methods and findings are reported is critical for future reviewers. In essence, manuscripts will be expected to include specific details to allow readers to make a judgement about the quality of the manuscript with, for example, details on ethical approval and procedures, details on allocation concealment, randomization implementation, treatment providers, outcome assessors, sample size justification, method of analysis (e.g., intention-to-treat), and a participant flow diagram (showing how many participants were invited into the study, how many were randomised, treated and completed assessments). The CONSORT statements were originally published in the *British Medical Journal* (1996), and a revised version can be found in the *Lancet* (2001) (see [http://dx.doi.org/10.1016/S0140-6736\(00\)04337-3](http://dx.doi.org/10.1016/S0140-6736(00)04337-3)). As editors, we are concerned about the well-being of research participants and would like to see evidence that, especially for vulnerable people with mental illness, appropriate ethical procedures were in place from initiation of the questions to the dissemination of the results. As a way of fostering the development of intervention research we will be interested in publishing high quality papers that describe the research design, methods and intervention of rigorous trials designed to examine the effects of physical activity on mental health.

There is now acceptance that overly focusing on RCTs as the gold standard of evidence may limit the knowledge base to make sound decisions about public health priorities and interventions (Harris et al., 2001; Victora, Habicht, & Bryce, 2004) and that the adoption of public health programs and policies should be based on a range of evidential criteria (see Briss, Brownson, Fielding, & Zaza, 2004). Overall, we believe that a range of research designs, drawn from the diverse disciplines available, can all contribute to not only developing our evidence base to support the consideration of physical activity as a mental health promotion strategy but also our evidence-based practice. The importance of other levels of evidence is often minimised and yet the most appropriate research methods to ask how physical activity enhances mental health may well involve in-depth interview studies, case studies, ethnographic approaches, or insights from narrative psychology for example. Such research is critical for developing our understanding of what interventions should be developed and which processes they should target. The journal will publish research with an emphasis on Levels 1–2 of research evidence. Levels 3–4 are welcome when they either challenge existing knowledge through novel methodological approaches or clearly provide new insight regarding the physical activity and mental health relationship. These levels are taken from the Cochrane Review Database (CRD) Guidelines on Systematic Reviews of Research on Effectiveness: CRD Report 4. NHS Centre for Reviews and Dissemination, U. of York, 1996:

- Level 1 Randomised controlled trial.
- Level 2.1.1 Controlled trial with pseudo-randomization.
- Level 2.1.2 Controlled trial with no random allocation.

- Level 2.2.1 Prospective cohort study with concurrent controls.
- Level 2.2.2 Prospective cohort study with historical controls.
- Level 2.2.3 Retrospective cohort study with concurrent controls.
- Level 2.3 Retrospective case-control study.
- Level 3 Pre-post comparative study with no controls.
- Level 4 Opinions of respected authorities based on clinical experience.
 - Reports of expert committees. Descriptive studies (e.g., cross-sectional surveys; qualitative designs; case studies).

The science that underpins our understanding of the link between physical activity and mental health is at a critical stage. As policy makers demand an evidence-based science to underpin their investment in health service interventions, and other opportunities to improve mental health, it is important that credibility, causality, feasibility and user acceptability are demonstrated, and debates about epistemology are aired. Hill (1965) suggested several criteria for differentiating between an association and causal link between the environment and health including:

- Strength of association (effect size).
- Consistency of effects.
- Specificity of effects.
- Temporal sequence in the observations (i.e., from pre- to post-intervention).
- A dose-response relationship.
- Biological plausibility.
- Coherence (i.e., evidence from variety of sources).
- Experimental evidence (i.e., involving the comparison of a treatment versus control).

Studies examining the relationship between physical activity and mental health in the context of these criteria are particularly welcome.

The link between acute and chronic effects of physical activity on mental health is also unclear. Chronic improvements in mental health may be a residual effect of recent bouts of physical activity rather than any long-term change. Methodological advances are needed to unpick such relationships and effects. Advances in the way we examine the acute effects of exercise on affect (e.g., activation and pleasure) through greater conceptual clarity and methodological rigor are expected to continue to develop our thinking of how exercise enhances psychological well-being (Acevedo & Ekkekakis, 2006).

3.3. Evidence for the effects of physical activity on mental health

We are interested in research that examines the role of physical activity across the lifespan in a) preventing mental health problems, b) promoting mental health, c) improving the quality of life for people with mental health problems, and d) as a treatment or therapy for existing mental illness. Interest has tended to focus on the effects of physical activity on just a few dimensions of mental health, namely, depression, stress and anxiety, mood, and self-esteem, mainly at the sub-clinical level. Table 1 shows some of the findings from a consensus process in which authors were invited to review the evidence and produce summary statements about what we know and what we need to know, alongside clinical practitioners, leading scientists and policy makers (Biddle et al., 2000). Table 2 shows our attempts (Faulkner & Taylor, 2005) to draw together evidence of emerging relationships between physical activity and other dimensions of mental health. Again we highlight 'what we know' and 'what we need to know' though in formulating the book we did not engage others in a peer review process. These tables are not intended to be definitive reviews

Table 1
Physical activity and psychological well-being (Biddle et al., 2000)

Domain	What we know	What we need to know
Anxiety and stress (Taylor, 2000)	<ul style="list-style-type: none"> Exercise has a low-to-moderate anxiety-reducing effect. Exercise training can reduce trait anxiety and single exercise sessions can result in reductions in state anxiety. The strongest anxiety-reduction effects are shown in randomised controlled trials. Single sessions of moderate exercise can reduce short-term physiological reactivity to and enhance recovery from brief psycho-social stressors. 	<ul style="list-style-type: none"> We need to know more about the long-term effects of accumulated doses of activity. We know little about the anxiety-reducing effects of short bouts (<15 min) of free-living, unsupervised aerobic physical activity, which can be most easily integrated into an active lifestyle, as a low-cost intervention. Further evidence is needed to show how improved fitness may reduce cardiovascular, neuroendocrine, and cerebral reactivity to and recovery from psycho-social stressors.
Depression (Mutrie, 2000)	<ul style="list-style-type: none"> There is support for a causal link between exercise and decreased depression. Epidemiological evidence has demonstrated that physical activity is associated with a decreased risk of developing clinically defined depression. Evidence from experimental studies shows that both aerobic and resistance exercise may be used to treat moderate and more severe depression, usually as an adjunct to standard treatment. The anti-depressant effect of exercise can be of the same magnitude as that found for other psychotherapeutic interventions. No negative effects of exercise have been noted in depressed populations. 	<ul style="list-style-type: none"> Are the psychological effects of physical activity the same for different modes of activity (e.g., aerobic, strength-based, flexibility-based)? How do effects of exercise compare to those of drug treatments and what adjunctive value does exercise have along with drug treatment? If drugs are also administered is the interaction of drug and exercise safe?
Emotion and mood (Biddle, 2000)	<ul style="list-style-type: none"> Physical activity and exercise have consistently been associated with positive mood and affect. Meta-analytic evidence shows that aerobic exercise has a small-to-moderate effect on vigour (+), tension (–), depression (–), fatigue (–) and confusion (–), and a small effect on anger (–). A positive relationship between physical activity and psychological well-being has been confirmed in several large-scale epidemiological surveys, including in the UK, using different measures of activity and well-being. Experimental trials support a positive effect for moderate intensity exercise on psychological well-being. 	<ul style="list-style-type: none"> Are the associations between physical activity and psychological well-being causal? Is physical activity likely to produce superior psychological effects for some groups, such as women? Are current psychometric measures of HRQL and exercise-related affect adequate for capturing the range of affective responses in physical activity? What mechanisms explain the link between PA, affect and mood?
Self-esteem (Fox, 2000)	<ul style="list-style-type: none"> Exercise can be used as a medium to promote physical self-worth and other important physical self-perceptions such as body image. In some situations, this improvement is accompanied by improved self-esteem. Physical self-worth carries mental well-being properties in its own right and should be considered as a valuable end-point of exercise programs. Positive effects of exercise on self-perceptions can be experienced by all age groups but there is strongest evidence for change for children and middle-aged adults. Several types of exercise are effective in changing self-perceptions but there is most evidence to support aerobic exercise and resistance training, with the latter indicating greatest effectiveness in the short-term. 	<ul style="list-style-type: none"> The degree to which self-perception and self-esteem change is accompanied by reductions in clinical symptoms, indicators of emotional adjustment and general well-being. More about the optimal conditions under which potential mechanisms might operate. More about which individual characteristics increase responsiveness to mechanisms of change. More about the dynamics of change. Little is known about how long it takes to produce changes and how long they last.
Cognitive functioning (Boutcher, 2000)	<ul style="list-style-type: none"> The majority of cross-sectional studies show that fit older adults display better cognitive performance than less fit older adults. The association between fitness and cognitive performance is task-dependent, with most pronounced effects in tasks that are attention-demanding and rapid (e.g., reaction time tasks). Results of intervention studies are equivocal but meta-analytic findings indicate a small but significant improvement in cognitive functioning of older adults who experience an increase in aerobic fitness. 	<ul style="list-style-type: none"> What are the mechanisms underlying the effects of fitness on the enhanced cognitive performance of older adults? What is the dose-response relationship? In other words how much of a fitness improvement needs to occur before an increase in cognitive performance is demonstrated? What happens to the cognitive performance of those individuals who stop exercising?
Psychological dysfunction (Szabo, 2000)	<ul style="list-style-type: none"> Exercise dependence is extremely rare. Many people suffering from eating disorders undertake high levels of physical activity. The personality characteristics of anorexics are significantly different from highly committed exercisers. 	<ul style="list-style-type: none"> What factors cause exercise dependence? Could exercise have a positive effect on some eating disorders? What are the relationships between aspects of athleticism, body image/concern, exercise and eating disorders?

Table 2

Exercise, health and mental health: emerging relationships (Faulkner & Taylor, 2005)

Dementia (Laurin, Verreault, & Lindsay, 2005)	<ul style="list-style-type: none"> Physical activity has been shown to be inversely associated with cognitive decline. Case-control studies tend to show a slight beneficial influence of physical activity against Alzheimer's disease (AD). Prospective analyses tend to show a more convincing protective effect of physical activity against AD and all forms of dementia combined. No evidence of harmful effects of physical activity or exercise is evident (including vigorous exercise). 	<ul style="list-style-type: none"> Is lower intensity physical activity as effective as higher intensity physical activity? Could physical activity in mid-life prevent the onset of dementia in late life? What are the benefits of short-term programs of exercise? How long does it take for an exercise program to show any protective effects? Do physical activities that require concentration (or concurrent mental activity) have a stronger protective effect than physical activity alone?
Schizophrenia (Faulkner, 2005)	<ul style="list-style-type: none"> There is a high incidence of obesity and other morbid conditions strongly related to physical inactivity in this population. The existing research examining the psychological benefits of exercise participation does have many methodological flaws and tends to be of pre-experimental design. There is some tentative support that participating in exercise is associated with an alleviation of negative symptoms associated with schizophrenia, such as depression, low self-esteem, and social withdrawal. There is less evidence that exercise may be a useful coping strategy for dealing with positive symptoms, such as auditory hallucinations. 	<ul style="list-style-type: none"> Are the determinants of exercise different in this population? How should interventions be best designed to help individuals with schizophrenia adopt and maintain adherence to exercise programs? Are the psychological benefits of exercise participation supported by stronger research designs such as RCTs? How does exercise interact with medication and other common therapeutic strategies such as CBT? What is the effect of regular exercise participation on other important outcomes such as use of health services, medication compliance, and rate of relapse?
Drug & alcohol rehabilitation (Donaghy & Ussher, 2005)	<ul style="list-style-type: none"> There is unequivocal support that physical exercise regimens have a positive effect on aerobic fitness and strength if administered as an adjunct in alcohol rehabilitation. There is unsubstantial evidence for the benefits of exercise on fitness during drug rehabilitation. The link between improvements in self-esteem and exercise with alcohol and drug rehabilitation at this time is equivocal. There is limited support that exercise regimens have a positive effect on reducing anxiety and depression if administered as an adjunct in alcohol and drug rehabilitation. The evidence for exercise improving abstinence levels or controlled drinking levels is at this time equivocal. 	<ul style="list-style-type: none"> Further studies are needed to systematically examine the barriers to exercise, and other psycho-social determinants of exercise, among drug users and problem drinkers. What is the optimum strategy for changing multiple health behaviors? Exercise screening may be necessary. How should practitioners and researchers tailor the exercise 'dosage' in relation to the physical health complications common in this population? What is the potential role of exercise counseling in improving adherence and abstinence? What is the preventative role of physical activity in alcohol and drug use?
Heart failure (Lloyd-Williams & Mair, 2005)	<ul style="list-style-type: none"> Patients with Congestive Heart Failure (CHF) show evidence of anxiety and depression and experience a dramatic reduction in their quality of life. Significant improvements in exercise capacity have been demonstrated in CHF patients included in clinical trials. The evidence suggests that exercise can play an important role in improving the function and quality of life of patients with CHF. 	<ul style="list-style-type: none"> Studies are required to examine the effect of exercise on psychological status in CHF. We need to know if different modes, intensities and durations of exercise have an effect upon the psychological status of patients with CHF. There is currently no validated and reliable instrument for measuring the psychological and emotional effects of exercise upon patients with CHF, within clinical practice. The cost-effectiveness of exercise training for reducing morbidity and mortality in patients with heart failure has not been examined.
HIV & Aids (Stringer, 2005)	<ul style="list-style-type: none"> HIV and AIDS markedly increase the incidence and prevalence of depressive symptoms. Aerobic exercise training was associated with quantifiable improvements in aerobic fitness; however, the effects on psychological well-being are less certain. There is a decrease in the rate of depressive symptoms and improved QOL/psychological well-being in HIV⁺ subjects (regardless of disease stage) using a very wide variety of QOL instruments. The exercise program (e.g., dose) to improve fitness should consist of 45 min, three times per week of aerobic exercise combined with a smaller component of resistance training. 	<ul style="list-style-type: none"> The long-term effects of aerobic exercise program (i.e., >12 weeks) on psychological well-being. The long-term effects of an aerobic exercise program on mortality and physical and psychological morbidity. The effect that complicated drug regimen (HAART) will have on the importance of aerobic exercise training on psychological well-being in HIV. What is the minimum exercise stimulus ("dose") required to generate improvements in psychological well-being?

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Table 2 (continued)

Cancer and quality of life (Courneya, 2005)	<ul style="list-style-type: none"> The number of cancer survivors will continue to increase in the coming decades. Cancer and its treatments often have negative effects on quality of life. Exercise has been shown to improve quality of life, especially in breast cancer survivors and especially after treatments have been completed. Exercise may improve quality of life in cancer survivors beyond the benefits of group psychotherapy. Reduced fatigue may be one of the key factors explaining why exercise enhances quality of life in cancer survivors. 	<ul style="list-style-type: none"> What is the effect of exercise on quality of life in cancer survivor groups other than breast (e.g., prostate, colorectal, lung, endometrial)? What is the effect of exercise on quality of life during cancer treatments other than dose-intensive chemotherapy with stem cell support (e.g., external beam radiation therapy, brachytherapy, conventional chemotherapy, hormone therapy, biologic therapy)? What is the safety, feasibility, and efficacy of exercise for cancer survivors with advanced disease receiving palliative care?
Smoking cessation (Taylor & Ussher, 2005)	<ul style="list-style-type: none"> The few rigorous trials reported have shown mixed effects of exercise on smoking cessation. There is evidence that interventions can increase exercise participation among smokers, pre-quitters and quitters, but the evidence that such change enables weight management (a common cause of relapse) among quitters is less clear. There is increasing evidence that single sessions of exercise, at a low-to-moderate intensity (e.g., walking) can help temporary abstainers to cope with withdrawal symptoms and nicotine cravings, particularly in laboratory conditions. 	<ul style="list-style-type: none"> There is a need to better understand how exercise interacts with pharmaceutical interventions, with implications for managing weight and withdrawal symptoms. The effects of exercise on smoking cessation should be considered with other populations (e.g., adolescents, pregnant smokers) and in other settings, with rigorous trials. Further evidence is needed to understand how exercise may positively influence some of the established triggers to relapse during cessation, including psycho-social stressors and cigarette cravings.
Sleep (Youngstedt & Frelove-Charton, 2005)	<ul style="list-style-type: none"> People believe that exercise is an important sleep-promoting behavior. Individuals who exercise regularly have a lower risk of disturbed sleep but causal effects are less well established. Chronic exercise training may elicit significant improvements in sleep in individuals with disturbed sleep although there is no clear consensus. Acute exercise elicits a modest improvement in sleep among good sleepers. This effect is greater for longer exercise durations. The influence of acute exercise on sleep is similar for fit and unfit individuals. Exercise intensity or time-of-day of exercise do not have much moderating influence. 	<ul style="list-style-type: none"> We need to establish whether acute and/or chronic exercise promotes sleep in individuals with impaired sleep. Moreover, it is important to establish how exercise compares with other sleep treatments, including hypnotics and cognitive/behavioral therapy. Also, it will be important to establish whether exercise could be an effective adjuvant sleep treatment. There is a need for research exploring dose-response effects of various exercise parameters, such as intensity and duration. Also, interactions of these parameters should be assessed.
Sport, social inclusion & crime reduction (Coalter, 2005)	<ul style="list-style-type: none"> The most effective use of sport, to address systematically anti-social and criminal behaviour, is to combine with programs that seek to address wider personal and social development. The salience of sport can be used to attract young people to integrated programs that offer formal programs in personal development, health awareness and employment training. Appropriate leadership is perhaps the most important element in determining the positive impact of a program. 	<ul style="list-style-type: none"> We need to understand the elements of process required to maximise desired intermediate impacts – the various combinations of such factors as voluntary participation, leadership, the mixture of rules and regulations, task versus ego orientation, protective factors, personal and vocational development, length of program and post program support. More longitudinal studies which track participants in a variety of programs to assess the long-term behavioural outcomes of (possibly) short-term attitude change.

and none involved objective meta-analytic procedures. Most reviewers did involve systematic search techniques to develop the evidence base. Inclusion of the summary tables here are more to set the scope for the journal and provide a quick starting point for those wishing to become involved in the field of physical activity and mental health.

3.4. Bio-physical and psycho-social mechanisms

Earlier we identified 'plausible mechanism' as a criteria suggested by Hill (1965) for demonstrating a causal relationship. Many researchers have examined either bio-physical or psycho-social mechanisms as mediators between engagement in physical activity and psychological well-being, particularly in the context of acute effects from a single bout of exercise. The former include changes in body temperature, neurotransmitters, or reduced

muscle tension. The latter include changes in perceived competence, perceptions of autonomy and control, social processes (e.g., affiliation with others, changes in perceived identity), and cognitive processes (e.g., reduced negative rumination, thought suppression of urges to engage in addictive behaviours and enhanced pain management). It is clear that physical activity, exercise and sport can elicit both positive and negative mental health outcomes knowing how the respective bio-physical and psycho-social processes operate is essential in designing the optimal intervention in research studies and for practitioners.

Linked to the question of mechanisms is one of dose-response. Is there an optimal amount of physical activity that can confer mental health benefits? The DOSE study (Dunn, Trivedi, Kampert, Clark, & Chambliss, 2002; Dunn, Trivedi, Kampert, Clark, & Chambliss, 2005) has paved the way for more research. The increasingly popularity of relatively low intensity activity (e.g., Tai Chi, Yoga), and brief bouts

of convenient activity (e.g., walking) broadens the scope for understanding how physical activity influences mental health. Perhaps just small changes in activity is important for sedentary people, or those with specific genotypes.

Perhaps the most rapid advances in understanding mechanisms have taken place in neuroscience, albeit most often with animal models. Dishman et al. (2006) wrote that:

Voluntary physical activity and exercise training can favorably influence brain plasticity by facilitating neurogenerative, neuroadaptive, and neuroprotective processes. These adaptations in the central nervous system have implications for the prevention and treatment of obesity, cancer, depression, the decline in cognition associated with aging, and neurological disorders such as Parkinson's disease, Alzheimer's dementia, ischemic stroke. Mechanisms explaining these adaptations are not as yet known, but metabolic and neurochemical pathways among skeletal muscle, the spinal cord, and the brain offer plausible, testable mechanisms that might help explain effects of physical activity and exercise on the central nervous system (p. 345).

There is a danger that such advances leave behind many researchers who are not acquainted with such techniques. When publishing such research we plan to provide a brief commentary to explain in more accessible terms the findings and implications.

According to the Surgeon General's Report (U.S. Department of Health and Human Services, 1999):

Mental health and mental illness are dynamic, ever-changing phenomena. At any given moment, a person's mental status reflects the sum total of that individual's genetic inheritance and life experiences (p. 16).

Because a diverse range of factors influence a person's mental health at any point in time it is likely that a combination of triggers interact to result in a mental health problem. It appears that "the causes of most mental disorders lie in some combination of genetic and environmental factors, which may be biological or psychosocial" (U.S. Department of Health and Human Services, 1999, p. 16–17). From a practical perspective, although all psychological processes are, at the most fundamental level, carried out by chemical or biological processes this does not imply that chemical or biological factors actually *caused* the disorder (Bedi, 1999). Because psycho-social factors also directly impact mental health, a sole focus on biochemical change is insufficient to adequately explain changes in mental functioning (Faulkner & Carless, 2006). This argument is particularly pertinent when we consider that psychological benefits through exercise have often been found independent of biochemical change or improvements in physical fitness. Psycho-social factors related to exercise participation, in contrast to changes in biochemical or physiological parameters, appear to be critical in many mental health settings and demand further attention (Fox, 1999). Qualitative research may be a complementary and informative approach in unpicking the ideosyncratic responses to a fixed dose of exercise and to a free-living environment in which an exercise intervention is offered (Faulkner & Biddle, 2004).

3.5. Evidence-based source

Translating scientific evidence into policy and practice is a major concern in a field where the intervention (physical activity) does not have large marketing budgets to promote its product(s), and the intervention may seem rather trivial and simplistic to merit consideration and investment relative to other therapies (Faulkner & Biddle, 2001). The US Surgeon General (U.S. Department of Health and Human Services, 1999) highlighted some

important translational issues relating to mental health services. These included:

- lag time between reporting research results and translation of new knowledge into practice;
- complex and fragmented mental health service delivery system can create barriers to a full range of appropriate services;
- practitioners' lack knowledge of research results.

Irrespective of issues about accumulating sufficient quality evidence for a causal effect of physical activity on mental health, translating evidence into policy and practice still faces a major hurdle. While many health professionals and other practitioners may believe that physical activity is important for enhancing mental health it may rarely feature in their professional activities (Faulkner & Biddle, 2001). Pharmaceutical companies invest huge sums in marketing their products. Understanding how to translate evidence that physical activity is beneficial for mental health into practice receives little interest from scientists. We hope to offer an outlet for researchers to consider the link between evidence accumulation, dissemination and influencing professional practice and policy. This may include research that improves our understanding of the health economics of physical activity for mental health promotion. We welcome reports on processes and initiatives to include physical activity in guidelines for treating specific mental health outcomes in public documents. Forming consensus statements is an important process in the science of dissemination. Indeed, statements may even be uninformative and harmful if they are written from an uninformed position. For example, in the UK, the National Institute of Clinical Excellence (NICE) (2004) guidelines for exercise in the treatment of depression recommend the following:

"Patients of all ages with mild depression should be advised of the benefits of following a structured and supervised exercise program of typically up to 3 sessions per week of moderate duration (45 minutes to 1 hour) for between 10 and 12 weeks (p. 15/16)."

Such statements can become dated very quickly, which highlights the need for a new journal on *Mental Health and Physical Activity*. For example, the DOSE study (Dunn et al., 2002, 2005) suggested that an accumulation of 30 min on 5 or more days a week was the minimum dose needed to reduce depression. This is clearly in contrast to the NICE guidelines, and provides a far more palatable message to practitioners and service users.

We suggest that there are multiple types of evidence which help to advance both practice and policy (see Faulkner, Taylor, Ferrence, Urban, & Selby, 2006). We will publish rigorous, systematic reviews of qualitative or quantitative evidence across the broad field of mental health and physical activity which we hope will contribute as an evidence-based source. In time, we hope to include a 'Reader's Digest' of current research published in other journals. We will also invite letters and brief notes from policy makers, researchers, practitioners and indeed mental health service users, which will help to promote the field and inform others (e.g., news of national policy changes such as, the development of guidelines for treating mental illness that include physical activity, that is of relevance to global readers).

As editors, we have set ourselves the challenging task of establishing a journal that is not limited by disciplinary boundaries in extending our understanding of the relationship between physical activity and mental health across the lifespan in terms of efficacy, effectiveness, and the potential mechanisms underpinning potential mental health benefits. We hope you find *Mental Health and Physical Activity* (MENPA) a valuable source of information and inspiration.

Finally, we are indebted to Elsevier, our publishers, who have conducted extensive market research prior to agreeing to invest

in MENPA. The journal is listed under their growing number of scientific publications in the field of Clinical Psychology, and with their links to 'SCOPUS' (the world's largest abstracting and indexing database) and 'ScienceDirect' (with an impressive on-line access to full-text articles and abstracts) we are confident that the journal will quickly make an impact in the scientific community.

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