Exercise and mental health: a complex and challenging relationship

There is gathering interest and momentum around research into exercise as a treatment for mental health disorders.[1] The appeal is multifaceted: patients, particularly those reluctant to pursue medication or psychological approaches, are drawn to the self-efficacy of exercise, the ability to attain a degree of agency in their own process of recovery. Mental health professionals, for their part, recognise the urgent need to address the comparatively poor physical health outcomes in the psychiatric patient population.[2] With very high rates of physical comorbidity,[3,4] and marked reductions in life expectancy,[5] an intervention that might improve both mental and physical health is of particular clinical interest.

In *The Lancet Psychiatry*, Sammi Chekroud and colleagues[6] have drawn on a large cross-sectional dataset of more than 1·2 million respondents to the Behavioral Risk Factor Surveillance System survey by the US Centers for Disease Control and Prevention to explore associations between exercise and mental health. Their principal finding that individuals who exercise report 1·49 fewer days of poor mental health in the previous month than those who do not exercise (W=7·42×10^{10}, $p<2·2\times10^{-16}$) is intriguing and relevant, and certainly lends legitimacy to the importance of more focused research in this area. The study's greatest strength—namely, its size—requires the authors to pursue a broad methodological approach in addressing what is a complex and variously defined question. Readers should therefore bear in mind certain important limitations before considering any clinical application.

In presenting mental health as a workable, unified concept, there is a presupposition that it is possible and appropriate to combine all the various mental disorders as a single entity in pursuing this research. It is difficult to see the justification for this approach when these conditions differ greatly in their underlying causes, clinical presentation, and treatment. Dementia, substance misuse, and personality disorder, for example, are considered as distinct entities for research and clinical purposes; capturing them for study under the combined banner of mental health might not add a great deal to our understanding.

The problem here of categorisation is somewhat compounded by the repeated contextualisation of this study with major depressive disorder. There is an uncomfortable interchangeability between mental health and depression, as if these concepts were functionally equivalent, or as if other mental disorders were somewhat peripheral.

In outlining their "Research in Context", the authors report searching for studies relating to depression. They do not reference the body of literature pertaining to exercise as treatment for schizophrenia, bipolar disorder, anxiety, or substance misuse.[7–10] Again, by process of selective contextualisation, the implication is that this study is of particular relevance to depression research.

Undertaking diagnostic interviews to identify mental health disorders and to assess their response to treatment might be impractical in a study of this scale. Validated questionnaire tools are often used as an alternative. In this study, results are extrapolated on the basis of one question to interviewees: "Now thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good?"

Patient self-reporting (ideally validated) is helpful in gathering data on patients' perspectives; however, there are limitations with this approach in drawing direct equivalencies to objective symptom burden. Although many patients do retain good insight into their mental health, it is accepted that this is not universal, with many conditions including schizophrenia, schizoaffective disorder, bipolar affective disorder, personality disorder, learning disability, substance misuse disorder, and functional and somatic illnesses impairing an individual's capacity to accurately self-report. In a wide-ranging study on mental health, on 1·2 million people, the complexity inherent in such diversity of mental states must be emphasised in results derived from a single self-report question.

A final caution pertains to how studies approach a definition of exercise. In the current study, we see the inclusion of activities such as childcare, housework, lawn-mowing, carpentry, fishing, and yoga as forms of exercise. In other studies, these activities would be

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excluded for not fulfilling the definition of exercise as offered by the American College of Sports Medicine: "planned, structured and repetitive bodily movement done to improve or maintain one or more components of physical fitness."[11] The study by Chekroud and colleagues, in its all-encompassing approach, might more accurately be considered a study in physical activity rather than exercise.

Nonetheless, this study remains important and urgent work, particularly in raising questions about future study design. The overall findings that the strongest positive associations occurred in popular sports, cycling, and aerobic and gym exercise, and that extremes in both frequency and duration of exercise were associated with worse outcomes, provide us with exciting points of departures for further exercise studies. A study such as this, unprecedented in scale, is to be welcomed in challenging us to design a complementary strand of precision research in the field, to answer questions relating to specific mental disorders and their associations with specific exercise interventions.

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