Commentary

Time to go green?

Nature-based physical activity as potential treatment for mental disorders

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Beyond physical activity's health benefits in the general population, there is increasing recognition that physical activity reduces symptoms in people with mental disorders as an adjunctive treatment in depression, bipolar disorders, and schizophrenia [1]. While in general, reviews and meta-analyses show positive effects of physical activity on psychopathology, it is still unclear which causal subcomponents of physical activity are most effective in reducing psychiatric symptoms and enhancing well-being in people suffering from mental disorders [1]. Commonly discussed characteristics include frequency, intensity, time, and type of physical activity [1].

Even less is known about the role of the context in which the physical activity is performed. The majority of studies investigated physical activity in an exercise context in laboratory environments (e.g., treadmill running or stationary cycling) or did not specify the physical activity environment [1]. Therefore, there is a growing interest in a stronger consideration of the physical activity context [2]. To this end, one especially promising candidate context for resilience is nature exposure. In particular, recent studies showed that exposure to green space decreases the risk for several types of mental illness, such as depression and anxiety, and improves psychological well-being, including fostering social interactions, happiness, and cognitive functioning [3]. Even in small doses, such as urban green space, nature exposure has been shown to be beneficial with especially psychologically vulnerable people benefiting from it [4].

The combination of physical activity combined with nature exposure is called nature-based physical activity and refers to physical activities conducted in spaces that are dominated by natural features, such as parks, forest, rocks, or lakes [2]. Theoretical explanations for the health-promoting effects of physical activity in nature include, for example, ecological dynamic approaches that emphasize the variability of the natural environment, such as different textures, slopes, and surfaces that require ongoing psychological engagement and adaptation of motor behavior [2]. Beyond the potential of the enhanced effectiveness, nature-based physical activity may also contribute to solving existing problems, including the lack of pragmatic and scalable methods for delivering physical activity to a large number of patients in an effective and engaging way [1]. For example, it may be more promising to offer physical activity programs in natural environments close to patients' home and treatment facilities rather than solely offering indoor physical activity programs.

Empirically, to date, some studies in children and adults indicate enhanced psychological benefits of nature-based physical activity [5, 6]. However, these studies were largely conducted in non-clinical populations. To address this gap, we aimed to conduct a systematic literature review.

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However, our search revealed only three heterogenous randomized controlled trials and three heterogenous crossover randomized controlled trials on nature-based physical activity in psychiatric patient populations. Hence further empirical studies are required before a systematic literature review can be conducted and useful conclusions for practice and research can be drawn. The first results in adults with mental disorders are promising: A study with adult patients with major depressive disorder showed that positive affect and working memory capacity increased more after a walk in a park compared to a walk in the city center [7]. In patients with schizophrenia, a 16-week guided group-based outdoor cycling intervention resulted in a higher improvement of psychotic, depressive, and anxiety symptoms than occupational therapy [8]. However, in children with attention- deficit-hyperactivity disorder, no improvements in cognitive performance were observed after a 30-min walk in the natural (compared to the built) environment [9].

In addition to the lack of studies on nature-based physical activity in psychiatric populations, other challenges need to be overcome. First, especially in clinical populations, it may take several months until the clinical effect of a nature-based physical activity program becomes apparent. However, existing studies in the general population have mainly focused on the effect of short-term physical activity in nature, while programs with a longer duration are lacking [5, 6]. Second, several studies on nature-based physical activity were conducted in laboratory environments [5, 6]. Although laboratory studies may be a more feasible approach to studying patients with mental disorders from a practical standpoint, it is not face valid to investigate the mechanisms linking nature-based physical activity and green space exposure to improved mental health outcomes in a laboratory [2]. To test the effects of physical activity in nature with high ecological validity, participants should be exposed to real nature experiences and state-of-the-art methods, such as ambulatory assessments, should be used to collect data. In particular, geolocation tracking via wearables, physical activity monitoring via accelerometers, and assessment of well-being and psychopathology via electronic diaries on smartphones have been successfully used to study real-time within-subject processes in patients' everyday life to unravel such mechanisms [10]. This also allows, crucially, to measure who benefits most from such a treatment, as studies show that benefits vary considerably between participants [4].

Therefore, we advocate for more research on the potential benefits of nature-based physical activity as a treatment modality for people with mental disorders to address the knowledge gaps mentioned above. Although some studies in non-clinical populations show the potential of nature-based physical activity to improve mental health, it is not known whether nature-based physical activity shows enhanced treatment effects compared to non-nature-based physical activity in clinical populations. Such research may also be relevant to the discussion of specific guidelines for physical activity therapies to improve mental health.

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