

Is exercise a valuable method of preventing feelings of anxiety and depression in 16–21-year-olds during the COVID-19 lockdown?

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Abstract

The Coronavirus 2019 (COVID-19) pandemic has brought government enforced quarantine on many countries including the UK. One of the only permitted reasons to leave the home was exercise. A breakdown in normal routines has already caused a spike in online searches related to anxiety and depression. This is relevant to the 16–21 year age group as support systems that usually present in post-16 or higher education or workplaces are removed and feelings of disappointment at missing out on rites of passage are experienced. During lockdown, exercise both outdoors and at home via online workouts increased, with the combination of social interaction and physical activity providing a coping tool. The social facilitation theory provides insight into the mechanisms for prevention of feelings of anxiety and depression through exercise. It is vital for public health to continue the promotion of exercise at home during lockdowns and beyond to enable people to keep up their new regimes.

Abbreviations

COVID-19 – Coronavirus 2019

GPs – General practitioners

Introduction

At the time of writing Coronavirus 2019 (COVID-19) has claimed over 228,000 lives and infected a further 3 million people. With 211 countries having cases and the WHO declaring pandemic status on 11th March 2020, the virus has been cited the biggest global event since World War II.¹ Following the closure of schools, universities,

restaurants, gyms and other businesses in the days beforehand, the UK went under ‘lockdown’ measures on 23rd March 2020. On this day the prime minister laid out only 4 essential reasons for leaving the house.²

One of the permitted reasons for leaving the home was to participate in one form of outdoor exercise per day, choosing from walking, cycling or running. In the six weeks since enforcement, a perceptible increase in people exercising has not escaped the notice of both the public and press. This is coupled with a mass drive towards home workouts, be these self-directed, using recorded video or in live format. A pertinent example of home workouts being taken up are those by the personal trainer Joe Wicks, who set out to provide ‘PE classes for the Nation’ at 9am on weekdays. His live follow along at home workouts received 23 million views in the first week, with each subsequent session receiving between 500,000 to 1 million views to date.³

It is commonly accepted that exercise is a vital part of a healthy lifestyle, with many now recognising the benefits on mental as well as physical health.

In England, NICE recommend healthcare professionals to consider exercise as a preventative measure for depression as well as physical health problems such as cardiovascular disease.⁴

During an unprecedented time where isolation is the norm, loneliness is potentially at an all-time high,⁵ which is a predisposing factor for feelings of anxiety and depression. Perhaps a combination of the instantaneity of social media and the community feel of exercise could be considered as a protection against the development of symptoms of depression and anxiety.

A group of interest during these times of restrictions is young adults aged 16-21 years; without the structure and activity of secondary school, college or university how does one cope with potential mental health problems? With these institutions usually providing support in forms of socialising, pastoral care and on-site counselling services where do young adults now turn to cope with symptoms of anxiety or depression?⁶ Many of those not in education have been furloughed or are working from home instead of going into the work place, also leading to breakdown in routine and support systems.⁷

Compared to other demographics, arguably this group is missing out the most socially at an important stage of development between adolescence and adulthood.^{6,7} This group is in a time of life when usually the first tastes of independence and autonomy begin which usually would bring excitement and a sense of belonging to the more 'grown up' world of college, university or work. Due to lockdown much of this has been lost. For instance, many key milestones such as exams, graduations and similar 'coming of age' celebrations have been cancelled.⁷

Data search

The PubMed database was used to find relevant literature relating to exercise and specific mental health symptoms. The search terms were 'exercise' or 'physical activity' and these had to be included in the title or abstract. 'Anxiety' or 'depression', and 'young adult' or 'adolescent' and 'prevention' also had to be included in the title or abstract of papers. The operatives 'and' and 'or' were used.

Information relating to quarantine measures and their psychological effects on young adults was found using the same search technique. In addition, papers on coronavirus, social isolation and quarantine were sourced from PubMed and the Lancet. General news and opinion pieces in the media were also used due to the nature of the pandemic in current affairs and lack of well-established scientific reviews as the virus and the response of the government and healthcare is rapidly evolving. As the issues at hand are so new, grey literature was a prominent source. A similar strategy was used to collate data on exercise and physical activity during this time.

The sources of information were chosen based on relevance by reading abstracts of the papers brought up by the search terms. Those that focused on populations with other existing chronic diseases that were not mental health related were excluded.

Lockdown and mental health

With normal delivery by school and universities suspended in 188 countries, 1.5 billion young people are out of education and therefore the routine provided by these institutions.⁶ The negative psychological effects of these social isolation and quarantine measures are perhaps more profound than expected, including symptoms of anxiety and depression which could possibly continue into later life after quarantine measures end.⁷

A recent paper highlights the need for novel interventions to protect mental wellbeing in COVID-19, including prosocial behaviour and optimising online resources.⁸ Exercise at home in a virtual group would fulfil these criteria and is therefore a valuable option. The researchers also emphasised the negative outcomes of quarantine, including self-harm and suicide as well as psychosocial risks such as social disconnection, entrapment and bereavement.⁸

To examine the psychological and emotional effects of social distancing and isolation Young Minds released a survey of 2111 people aged 16-25 years in the UK. 83% of those with mental illness said their symptoms had been worsened by the pandemic. Out of all the participants, 60% cited exercise as an activity that was helpful for their mental health. Factors such as the breakdown of routine, change in living and financial circumstances, strained relationships, and missing family and friends could be catalysts in this situation.⁶ These are compounded by reduced access to support from primary care and counselling or therapy services.⁵

An article on Medium stated Google searches including the terms 'anxiety' and 'depression' along with 'coronavirus' increased drastically during quarantine.⁹

This trend is backed up in the focus population by the findings of the Teenagers' Experiences of Life in Lockdown study.⁷ Underpinning the mechanism associated with symptoms of worsened mental health is vital to ascertain preventative measures and, in this case, to determine how valuable exercise may be.

A review of 24 papers investigating the psychological impact of quarantine saw symptoms of post-traumatic stress in most articles. Other effects included frustration and fear of infection. Response to stressors such as inadequate supplies, financial strain and too little or too much information was cited as a source of these negative feelings.¹⁰ Through this study it was decided that effective and rapid communication was essential, and public health should draw attention to the altruism of self-isolating when this is done by choice. However, as the present quarantine is imposed by the government, the study predicts more long-term complications and higher distress levels than with voluntary self-isolation. This is pertinent to the present topic as stress tends to precipitate feelings of anxiety and depression.⁸

Exercise and feelings of anxiety and depression

Stephoe and Butler have been carrying out seminal research in this area in adolescents since the 1990s. This group was able to identify a dose response relationship between exercise and improved mental health.¹¹ This has been supported in more recent research; for example in a systematic review on overall health in adolescents, mental health was one of the factors most impacted by exercise interventions.¹² The strongest evidence gathered by the study was related to the short term benefits on mental health. It was concluded that exercise promotion should begin at a young age to ensure health benefits in adulthood. Another systematic review of cohort studies found consistent evidence to support a negative association between physical activity and depression in the future in 25 out of 30 studies examined.¹³

Another study in the USA between 2011 and 2015 found modality of exercise was not important, as any type of exercise was seen to provide a lower mental health burden.

Although all modalities of exercise were beneficial, participation in team sports resulted in the largest reduction in mental health burden, which was 22.3% lower than with no exercise participation.¹⁴

This was measured by self-recorded days of poor mental health, which means the results are reliant on subjective measures.

The relationship between exercise and stress is also important to

investigate, due to the distressing nature of quarantine. Taking this into account, a comparative trial of law students (chosen as a 'stressed' group) supported increased physical activity having a protective effect against symptoms including stress, anxiety and depression.¹⁵ This correlation was found to be stronger than in a less stressed group of students. However, level of exercise intensity was not recorded, only frequency. Students who exercised more often also reported stronger feelings of 'belonging' in their university community. Further social benefits were identified as well as psychological effects. In a review of 30 studies conducted between 1990 and 2012 by Eime *et al.*, multiple psychological and social health benefits were recorded, with the most universal being raised self-esteem, followed by reduced symptoms of depression.¹⁶ The positive relationship between exercise participation and self-esteem in the target demographic is supported by the findings of many research groups.^{16,17}

Social value of exercise

Social facilitation is the process by which an individual's performance is improved by the act of being part of a team doing the same activity.¹⁸ For example, studying in a library may be more productive, due to the motivation of being surrounded by others doing the same thing. Participating in a live workout class can be more enjoyable due to the element of motivation social facilitation provides.¹⁹

Eime *et al.*, also found that team sports were associated with better mental health outcomes as opposed to individual exercise, because of the social nature of the activity.^{16,19} This highlights the social value of live workouts under quarantine measures, as an atmosphere similar to team sport is cultivated. This can be helpful during a time when you cannot spend any time with people outside of your own household, let alone a sports team.

Furthermore, it is recognised that social relationships form a buffer during distressing events.⁸ In a recent paper, Lippi *et al.* tentatively recommended increased social connections via social media and smartphones during lockdown.²⁰ Interactive virtual exercise would fulfil this due to 'live comments/chat' features on livestreaming platforms. Their hesitancy in recommendation comes from existing negative associations between social media and mental health.²⁰ Researchers stated remedies should be readily put into action, something that has seen promotion by Sport England in their 'Stay in Workout' campaign.^{21,22} This aims to promote healthy and safe introduction to exercise, with warm up and recovery advice. A social media hashtag for people to share their experience and motivate others is also provided.²² By these modalities, exercise could provide a combination of digital connectivity, purpose and self-esteem necessary for prevention of negative psychological states such as loneliness, depression and anxiety.

Other benefits of exercise in lockdown

Exercise participation could be increased during this time as barriers are removed, such as cost of a gym membership, feeling judged or out of place in a typical gym setting or exercising outdoors and avoiding cold weather. There is often no equipment or membership needed.²³

Further to the aforementioned mechanisms, exercise contributes to a symbiotic relationship with other healthy behaviours such as healthy eating and sleeping well. This leads to overall improved mental health, and protection from negative psychological effects of social isolation. However, in studies of social outcomes it is difficult to elucidate a causal link due to the multifaceted, multifactorial factors of health, such as home life, relationships and life events.²⁴

Limitations of the present paper

There are shortcomings to this review because of the proximity in time of writing to the imposition of lockdown measures. This meant

much information was anecdotal or transferred from studies relating to similar situations. Even one year after the time of writing the evidence available in the literature is likely to be less limited and more conclusive.

Conclusion

From the research reviewed we can see that exercise is a valuable intervention for prevention of mild to moderate symptoms of anxiety and depression in young people. Exercise can be considered valuable for this age group because of improved self-esteem and the sense of wellbeing that comes with this. Higher self-esteem and mental wellbeing can translate to fewer symptoms of anxiety and depression. Looking at the COVID-19 pandemic, the extent of the psychological impacts from the present quarantine measures in the UK and worldwide remains to be seen. However, undeniable positives have arisen from these trying times, an anecdotal uptake in home and outdoor exercise being one of them. Perhaps without the drive and allowance for participation in these activities, symptoms of depression and anxiety would be far more prevalent in the focus group. Looking forward, it is unknown how both healthcare professionals as individuals, and public health campaigns can carry forward this positive trend post-quarantine. Inevitably this time will come with challenges of its own.

Perhaps the success of participation in and psychological benefits experienced from live workouts in 16-21 year olds could become the cornerstone for a new method of exercise prescription from GPs.

The NHS could provide live workouts on their website, or endorse other creators doing so. Patients at risk of mood disorders could be referred to participate. The mechanisms of these interventions are two pronged, firstly social interaction and secondly the physical act of moving the body, both resulting in reduced feelings of anxiety and depression.

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References

1. Hamid S, Mir MY, Rohela GK. Novel coronavirus disease (COVID-19): a pandemic (epidemiology, pathogenesis and potential therapeutics). *New Microbes and New Infections*. 2020;35:100679.
2. Nicola M, O'Neill N, Sohrabi C, et al. Evidence based management guideline for the COVID-19 pandemic - review article. *International Journal of Surgery*. 2020.
3. Evans M. Joe Wicks lands 1.2million new YouTube subscribers in one week as workout videos top 20million views: *Metro*; 2020. Available from: <https://metro.co.uk/2020/04/01/joe-wicks-lands-1-2million-new-youtube-subscribers-one-week-12492592/>. Accessed: 30 April 2020.
4. NICE. Physical activity: exercise referral schemes Public health guideline [PH54]: National Institute for Health and Care Excellence; 2014. Available from: <https://www.nice.org.uk/guidance/ph54/chapter/What-is-this-guideline-about>. Accessed: 30 April 2020.
5. Hiremath P, Suhas Kowshik CS, Manjunath M, et al. COVID 19: Impact of lock-down on mental health and tips to overcome. *Asian Journal of Psychiatry*. 2020;51:102088.
6. Lee J. Mental health effects of school closures during COVID-19. *The Lancet Child & Adolescent Health*; 2020; 4(6) 421.
7. Demkowicz O, Ashworth E, Hanley T, 2020. Teenagers' Experiences of Life in Lockdown (TELL). Available at: <https://documents.manchester.ac.uk/display.aspx?DocID=50543>. Accessed: 8 May 2021.
8. Holmes EA, O'Connor RC, Perry VH, et al. Multidisciplinary research priorities for the COVID-19 pandemic: a call for action for mental health science. *The Lancet Psychiatry*.
9. BioBeats. Mental health-related Google searches spike amid global lockdown: *Medium*; 2020. Available from: <https://medium.com/@biobeats/mental-health-related-google-searches-spike-amid-global-lockdown-e3a8bbb9fe4>.
10. Brooks SK, Webster RK, Smith LE, et al. The psychological impact of quarantine and how to reduce it: rapid review of the evidence. *The Lancet*. 2020; 395(10227):912-20.
11. Steptoe A, Butler N. Sports participation and emotional wellbeing in adolescents. *Lancet*. 1996; 347(9018):1789-92.
12. Hallal PC, Victora CG, Azevedo MR, et al. Adolescent physical activity and health: a systematic review. *Sports Medicine*. 2006; 36(12):1019-30.
13. Mammen G, Faulkner G. Physical activity and the prevention of depression: a systematic review of prospective studies. *American Journal of Preventative Medicine*. 2013; 45(5):649-57.
14. Chekroud SR, Gueorguieva R, Zheutlin AB, et al. Association between physical exercise and mental health in 1.2 million individuals in the USA between 2011 and 2015: a cross-sectional study. *Lancet Psychiatry*. 2018; 5(9):739-46.
15. Skead NK, Rogers SL. Running to well-being: A comparative study on the impact of exercise on the physical and mental health of law and psychology students. *International Journal of Law and Psychiatry*. 2016; 49(Pt A):66-74.
16. Eime RM, Young JA, Harvey JT, et al. A systematic review of the psychological and social benefits of participation in sport for children and adolescents: informing development of a conceptual model of health through sport. *The International Journal of Behavioral Nutrition and Physical Activity*. 2013; 10:98.
17. Kipp LE. Psychosocial aspects of youth physical activity. *Pediatric Exercise Science*. 2016; 28(1):28-31.
18. Hooper AEC. An evolutionary approach to understanding social facilitation: Energy expenditure and exercise motivation. 2013. University of New Mexico Digital Repository.
19. Gaz DV, Smith AM. Psychosocial benefits and implications of exercise. *Archives of physical medicine and rehabilitation*. 2012; 4(11):812-7.
20. Lippi G, Henry BM, Bovo C, et al. Health risks and potential remedies during prolonged lockdowns for coronavirus disease 2019 (COVID-19). *Diagnosis*. 2020.
21. Williams SN, Armitage CJ, Tampe T, et al. Public perceptions and experiences of social distancing and social isolation during the COVID-19 pandemic: A UK-based focus group study. *MedRxiv*. 2020:2020.04.10.20061267.
22. Sport England. Stay in, work out: Sport England; 2020. Available from: https://www.sportengland.org/stayinworkout#join_the_movement.
23. Kaye S. Cooped up? Approaches to at-home exercise. *Companion Animal*.0(0):1-5.
24. Meyer OL, Castro-Schilo L, Aguilar-Gaxiola S. Determinants of mental health and self-rated health: a model of socioeconomic status, neighborhood safety, and physical activity. *American Journal of Public Health*. 2014;104(9):1734-41.