

Action Plan on mental healthcare. Furthermore, many people avoid seeking mental healthcare, largely because of stigma, discrimination and the high out-of-pocket costs of psychiatric care and medicines. The plan focuses on coordination with the health insurance programme to provide super-specialised mental health services at community level along with a telemental health service. However, this will be a challenge, as the national health insurance system is in its juvenile stage and there is inadequate digital health literacy among Nepalese people, especially those living in rural areas. Therefore, enhancing both mental and digital health literacy might be an appropriate strategy to improve mental healthcare utilisation. It is essential that every healthcare facility has a psychiatric unit. Moreover, a task-shifting approach involving the training of all primary healthcare workers in mental healthcare might be a viable solution towards making mental health services available at the community level.⁸ Additionally, it is crucial to clarify roles and responsibilities at each level of government to improve accountability and transparency in mental healthcare and create good governance to monitor both telemental health services and mental healthcare in Nepal.

Data availability

Data availability is not applicable to this article as no new data were created or analysed in this study.

Author contributions

R.S. conceptualised the study. Both authors contributed to this work and meet all four ICMJE criteria of authorship.



We have not evolved to become 'couch potatoes' in our old age

You don't need Pandora to tell you that exercise is good for your health and that it reduces morbidity and mortality. However, as our reproductive years come to an end, we are given or give ourselves license to slow down and retire from activities, particularly physical, and gracefully wait for the end. But is this what nature intended for us? Not so, say evolutionary biologists!

A research team from Harvard Medical School claims to have given the first evolutionary explanation for why lifelong physical activity, particularly during middle and old age, promotes health. Based on previous life history research, they assessed the evidence that humans were meant not just to continue living several decades after they stopped reproducing but also to remain at least moderately active during this period. The existing evolutionary hypothesis, in addition to the biomedical evidence, is that physical activity promotes health by allocating energy away from

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Declaration of interest

None.

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potentially harmful overinvestments in fat storage and reproductive tissues. The authors' proposed hypothesis is that physical activity also stimulates energy towards repair and maintenance processes in the body. These processes involve repair of muscle fibre and cartilage damage and healing microfractures, among other. Physical activity achieves this via release of antioxidants and anti-inflammatory substances as well as increasing blood flow.

They compare humans to apes, who usually live 35–40 years in the wild, generally do not survive past the menopause and are much less active than most humans. The authors claim that unlike apes, humans have been naturally selected not only to live longer but also to remain physically active throughout their lifespan. They also argue, based on fossil findings of 40 000 years ago, that our physically active ancestor hunter-gatherers, had a lifespan of around 70 years, which is well past reproductive age.

Get off that couch and go for a walk; your body will thank you and mother nature will applaud.

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Lieberman DE, Kistner TM, Richard D, Lee I-M, Baggish AL. The active grandparent hypothesis: physical activity and the evolution of extended human healthspans and lifespans. *Proc Natl Acad Sci* 2021; **118**(50): e2107621118.

Exercise, cannabis, inflammation and gut microbes

Our gut microbes have undoubtedly established themselves as major players in both our physical and mental health. They are involved in more normal and pathophysiological mechanisms in our bodies than we ever imagined. We are now told that they also play along with our endocannabinoids, but how? We know that endocannabinoid serum concentrations increase during exercise, and that exercise is good for depression, chronic inflammation and pain among other health benefits. Does the gut microbiome have anything to do with this? According to a study from Nottingham, there is an important connection between the microbiome and exercise-induced reduction in inflammation.

The researchers examined people with arthritis, of whom half took part in muscle-strengthening exercise (15 min daily for 6 weeks) and the other half did not. The exercise group showed an increase in good gut microbes such as *Bifidobacterium*, as well as in the anti-inflammatory substances produced by these microbes (short chain fatty acids), and this was linked to an increase in endocannabinoid serum concentrations and a decrease in inflammatory cytokines.

So, the next time your arthritis plays up, rather than reach for the cannabis oil, save yourself some money and go for a run instead, kicking your gut bacteria into action to stimulate your very own body's cannabis.

Vijay A, Kouraki A, Gohir S et al (2021) The anti-inflammatory effect of bacterial short chain fatty acids is partially mediated by endocannabinoids, *Gut Microbes*, **13**:1 DOI: [org/10.1080/19490976.2021.1997559](https://doi.org/10.1080/19490976.2021.1997559)

Regular exercise keeps anxiety away

Exercise not only treats anxiety but also prevents it, say Swedish researchers. In a large observational study that followed 395 369 people for a period of up to 21 years, they investigated whether participating in an ultra-long-distance cross-country ski race (Vasaloppet, up to 90 km) could lower the risk of developing anxiety. There were 197 685 skiers (median age 36 years, 38% women) and, compared with the non-skier participants, they had overall in both men and women a significantly lower risk of developing anxiety (adjusted hazard ratio (HR) 0.42). Interestingly, in men, there was no difference between those with higher and lower physical performance (measured as the time to finish) with respect to the risk of anxiety, but in women higher physical performance was associated with higher risk of anxiety compared with that of

slower skiing women (HR 2.00). The investigators will explore the gender difference, and Pandora will keep an eye on further findings on the subject.

Svensson M, Brundin L, Erhardt S, Hällmarker U, James S, Deierborg T. Physical activity is associated with lower long-term incidence of anxiety in a population-based, large-scale study. *Front. Psychiatry* [Epub ahead of print] 10 Sep 2021. Available from: <https://doi.org/10.3389/fpsy.2021.714014>.

'Humbly know thyself'

Personalised medicine has been promoted in recent years, but how personalised are psychotherapeutic approaches? We know from clinical experience that patients benefit from psychological treatments to varying degrees. Often the blame for poor outcomes is placed on the patient's inability or unwillingness to engage, particularly when evidence-based effective approaches such as cognitive-behavioural therapy are being used. What about the role of the therapist?

Researchers from Case Western Reserve University and the University of Massachusetts claim that the therapist's contribution to psychological treatment outcomes has not been focused on in previous research. In their research, they tested the prediction that patients experience more symptomatic and functional improvement in psychotherapy when a high-quality patient-therapist alliance exists, as well as when the patient has a more positive expectation for change. They also examined whether a given technique may be very different in the hands of one therapist compared with another, and whether certain therapist characteristics could predict which therapists would use relationship and belief processes to greater therapeutic benefit. They analysed data from randomised trials that compared case assignment methods in community-based healthcare settings involving just over 200 adults treated by 42 psychotherapists. During the treatment, which varied in type and duration, patients completed questionnaires that measured their alliance quality with the therapist and their expectations for improvement.

In keeping with the authors' predictions, better alliance quality and more positive outcome expectation were associated with better treatment outcomes. They also found that therapists showed different strengths and weaknesses in their use of relationship and belief processes. Furthermore, they found some preliminary evidence that therapists who used the alliance most effectively to promote patient improvement were those who were 'humbler' in assessing their own alliance-fostering abilities.

They conclude that 'If you learn the things that you do particularly well as a therapist, then you can tailor your practice and play to your

strengths'. Lesson for us all in our clinical practice, irrespective of specialty.

Coyne AE, Constantino MJ, Boswell JF, Kraus DR. Therapist-level moderation of within- and between-therapist process–outcome associations. *J Consult Clinical Psychol* [Epub ahead of print] 2021. Available from: <https://doi.org/10.1037/ccp0000676>.

Ignore your circadian rhythm at your peril

We generally know what time of the day we function at our best: some of us are morning people (larks) and others evening people (owls). How much attention, however, do we pay to this, particularly if our work schedule is dictated by others and, as doctors, we have to make important decisions about other peoples' health at any time during our working hours. Hopefully, our biological clock has adapted effectively to this schedule. However, if you are doubling as an amateur in investment, you may need to think carefully what time of the day you make your decisions on the matter.

Researchers at the University of Central Florida draw attention to the importance of being an 'owl' or a 'lark' when making investment decisions. In their study, the participants were recruited from social media accounts following crowdfunding platforms in the USA and were surveyed as to whether they were morning (lark) or evening (owl) people, their investment experience and their time zone. They were also asked to report their sleep quantity and crowdfunding experience. The experiment involved completing a decision-making task at an assigned time, for example, if they had \$1000 to invest, how much would they allocate to particular companies? The study results showed that owl investors were more likely than lark investors to put their money into unsuccessful ventures in the morning, and lark investors were less successful in the investment venture if this was done in the evening.

Guarana CL, Stevenson RM, Gish JJ, Ryu JW, Crawley R, et al Owls, larks, or investment sharks? The role of circadian process in early-stage investment decisions. *J Bus Ventur* [Epub ahead of print] 8 Nov 2021. Available from: <https://doi.org/10.1016/j.jbusvent.2021.106165>.

Dream on, clear your brain

We humans and most animals need sleep, some more than others. Sleep is good for

the health of our DNA, but this is a subject for another time. The usefulness of REM sleep (the rapid eye movement stage of sleep associated with dreaming) was the subject of investigation in a recent study from the University of Tsukuba in Japan.

The researchers used electrical activity in the brain to identify REM sleep, non-REM sleep and wakefulness, and measured blood flow in mice using a dye that makes blood vessels visible under fluorescent light. This allowed them to directly observe the red blood cells flowing in the capillaries of the neocortex. Capillaries are the blood microvessels that pass nutrients from the blood circulation to the brain cells and remove their waste products.

Interestingly, they saw a massive flow of red blood cells in the capillaries in multiple cortical brain areas during REM sleep, but there was no difference between non-REM sleep and wakefulness. These findings are in conflict with human positron emission tomography studies that show increased blood flow during wakefulness, but they are in keeping with ultrasound imaging and laser doppler flowmetry studies in humans.

Interestingly, they identified the activation of adenosine A2a receptors as the mechanism underlying the changes in blood flow. Activation of A2a receptors by their neurotransmitter adenosine, released by neurons and glia, is known to cause vasodilatation. The investigators demonstrated that this was the key mechanism for the observed increase in brain blood flow during REM sleep by comparing red blood cell velocity in wild-type mice (mice with intact A2a receptors) with A2a receptor-knockout mice (laboratory mice that had the gene regulating A2a receptors removed). They found that in the A2a receptor-knockout mice, there was less increase in blood flow during REM sleep compared with the wild-type mice.

The authors consider their findings – in particular, the role of adenosine A2a receptors – to be relevant to further research into Alzheimer's disease, where reduced brain blood flow and decreased REM sleep are correlated with the build-up of waste products and the development of the disease.

Tsai C-J, Nagata T, Liu C-Y, Suganuma T, Kanda T, Miyazaki T, et al Cerebral capillary blood flow upsurge during sleep is mediated by A2a receptors. *Cell Rep* 2021; **36**(7): 109558.