

Understanding the link between genetics, exercise, and obesity

A recent study in the *Journal of the American Medical Association (JAMA)* looked into why some people tend to gain weight more easily than others, even if they exercise regularly. Researchers analysed data from a large group of adults in the United States who provided information about how much they walked each day and their genetic makeup in relation to obesity.

They found that people with a higher genetic risk for obesity were more likely to become obese over time, regardless of how much they exercised. For instance, among those with the highest genetic risk, 43% became obese during the study, compared to only 13% of those with the lowest genetic risk.

Interestingly, the amount of walking someone did also played a role. People who walked more tended to have a lower risk of obesity, but the effect varied depending on their genetic risk. For example, those with a high genetic risk needed to walk about 2,280 more steps each day than average to see the same reduction in their risk of obesity. On the other hand, those with a low genetic risk could get away with walking about 3,660 fewer steps each day and still see the same benefit.

This suggests that genetics and physical activity both influence a person's risk of obesity, and the interaction between the two can vary widely from person to person. So, while staying active is important for everyone, some people may need to be extra diligent about their activity levels to offset their genetic predisposition to obesity.



Design your workplace with ergonomic physiotherapy

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Appropriate workplace design is essential for the working population to prevent work-related musculoskeletal disorders or pain. Muscles, bones, and joint pain resulting from a work-related activity (like long sitting, prolonged standing, or forward bending activity) is called work-related musculoskeletal disorders (WMSDs).

WMSDs can cause pain and disability in the lower back, neck, shoulders, knee, and other joints. Teachers, doctors, nurses, desk workers, bankers, and especially those who are doing long periods of repetitive movement or forceful activity in poor or awkward working positions are mostly affected by these disorders. According to the World Health Organisation (WHO), approximately 1.71 billion people globally have musculoskeletal disorders.

Relationship between pain and a poor workplace: Every person is unique and different. Different people have different body height, shape, and weight. For that reason, the working environment, including chairs, desks, computers, lighting, and room temperature, needs to adjust with the working population accordingly. Otherwise, it will create a poor working environment or poor workplace.

Poor workplace leads to poor posture and abnormal body movements that cause various health problems, such as: spinal pain (back and neck pain), headaches, eye strain, and fatigue, shoulder and elbow pain, tension in the hands and arms, leg cramps and tight leg muscles, knee and heel pain, tight muscles and joints.

What is ergonomic physiotherapy? Ergonomic physiotherapy is a special field of physiotherapy in which a qualified physiotherapist assesses a person's work place or work environment, body mechanics, and subsequently designs a work place that is fit for that individual. The aim of ergonomic physiotherapy is to reduce the risk of developing work-related musculoskeletal disorders

(WMSDs). Qualified physiotherapists are the ideal professionals for ergonomic assessment or workplace assessment because they have knowledge of body mechanics, movements, and posture. They also know the mechanisms by which work place, body movements, and posture lead to musculoskeletal pain.

Component of ergonomic physiotherapy:
1. Ergonomic Assessment: Identifying the abnormal ergonomic or risk factors in your work place that may lead to musculoskeletal disorders is called



ergonomic assessment. Ergonomic assessments include:

- Checking the working position or posture (sitting or standing).
- Identifying the body movement pattern (forward bending, twisting, and lifting techniques).
- Calculating repetition of movement (how many times are you doing the same task?).
- Examining the seating arrangement (does the working chair fit with your body height and give you comfort?).
- Observing the working surface (even or uneven).
- Accessibility of using tools (facilities of using carrying or lifting devices).

- Identify ambient noise and inadequate lighting.
- Set up working tools with the working person, following appropriate measurements. For example: computer screens, keyboards, and telephones.

2. Ergonomic Intervention: According to ergonomic assessment, ergonomic physiotherapists design for ergonomic intervention, which includes:

- Provide adjustable sitting and standing desks, adjustable chairs, and workstations.
- Arrange footrests, ergonomic keyboards, and lumbar support.
- Possible modifications in the office include, for example, reducing unhealthy noise and providing indirect, adequate lighting.

- Allot anti-fatigue standing mats.
- Provide a work-based exercise programme.
- Train employees to improve neck and shoulder posture.
- Encourage the use of safety tools during work.

Procedure for an ideal sitting position at work:

- **Head and neck:** straight and neutral.
- **Shoulder:** Relax.
- **Elbow:** Close to the body, at a 90-100 degree angle.
- **Computer screen:** should be positioned an arm's away (46-61 cm away) and the top of the screen at below eye level.
- **Keyboard:** Same height as elbow, and wrist slightly bent.
- **Spine:** An adjustable back support that maintains a normal spinal curve.
- **Hip and knee:** Perpendicular (90-100 degrees) to the ground.
- **Thigh:** Parallel with the floor.
- **Foot:** Should be flat on the ground.

A suitable working environment, the correct working position and style, and modifying some working activities can reduce the chance of getting work-related musculoskeletal disorders.

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HAVE A NICE DAY Popcorn brain

DR RUBAUL MURSHED

Popcorn brain has become an innovative term describing a cognitive state where the brain rapidly jumps from one thought to another, just like how popcorn kernels pop spontaneously. Cognitive



refers to the mental process of knowing, learning, and understanding things. Individuals with popcorn brains may notice increased forgetfulness, difficulty concentrating, heightened stress levels, and a sense of mental fatigue.

These symptoms can negatively impact productivity and overall mental well-being. Researchers have linked the proliferation of 'social media' to shorter attention spans, exacerbating the prevalence of popcorn brains among some individuals.

Nevertheless, the irresistible use of social media affects our brains in several ways. The continuous influx of information and stimuli from various sources contributes to a scattered and fragmented mental state. This popcorn term is linked to struggling to focus on one task amidst digital distractions. These constant assaults of distractions lead to an attention lag fragmented by the constant switching of tasks.

Psychologists widely attribute social media to being a major factor, as concentration struggles are prevalent among various mental health disorders. Excessive scrolling and browsing of new posts, screen actions, and advertisements trigger a small dopamine release that rewards the brain and fuels the cycle. Over time, always needing attention and quickly switching between tasks can make someone feel restless in their mind. It becomes difficult to focus on what is a priority for them.

Additionally, smartphones emit blue light and electromagnetic radiation, which are known to directly harm users' eyesight, neck, and spine, including poor sleep or insomnia. The World Health Organisation has described a global epidemic of sleeplessness, with approximately two-thirds of adults failing to obtain the recommended 7-8 hours of sleep each night. It is also dangerous to sleep near a smartphone.

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Air pollution and the risk of diabetes

DR SHAHJADA SELIM

The world is facing a very rapid rise in diabetes prevalence. Low- and middle-income countries are the worst sufferers. Among several other established risk factors for diabetes, environmental pollution, in particular air pollution, has been recognised as one important and preventable risk factor. Bangladesh is the top-ranked air pollutant country.



in the body, leading to oxidative stress. Oxidative stress can damage pancreatic beta cells along with many other cells, which can contribute to insulin secretory defects.

3. Alternation of adaptive levels: Adipokines are hormones secreted by adipose tissue (fat cells) that play a role in regulating metabolism. Air pollution has been shown to alter adipokine levels, potentially contributing to metabolic dysfunction and insulin resistance.

4. Endocrine disruption: Some air pollutants disrupt hormone regulation in the body, including hormones involved in glucose metabolism.

Several epidemiological studies have found associations between air pollution exposure and an increased risk of diabetes or impaired glucose metabolism. For example, a study published in *The Lancet Planetary Health* in 2018 found that higher outdoor concentrations of fine particulate matter (PM_{2.5}) and nitrogen dioxide (NO₂) were associated with an increased risk of diabetes worldwide.

Overall, while more research is needed to fully understand the relationship between air pollution and diabetes, the existing evidence suggests that reducing air pollution levels could potentially help prevent diabetes and improve public health. This underscores the importance of environmental policies aimed at reducing air pollution and promoting clean energy sources.

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Harnessing ChatGPT: A potential tool for addressing vaccine hesitancy and STI concerns

New research being presented at this year's ESCMID Global Congress in Barcelona, Spain suggesting that ChatGPT, an AI chatbot, could be a helpful tool in addressing concerns about vaccines and sexually transmitted infections (STIs). The study showed that ChatGPT could accurately answer common questions about vaccination and STIs, providing reassurance and factual information.

For vaccine hesitancy, ChatGPT offered accurate responses about the benefits of vaccination and addressed concerns about side effects. However, it sometimes missed specific details, like age recommendations for HPV vaccination. It also encouraged further discussions with healthcare professionals, which is important for personalised advice.

Regarding STIs, ChatGPT gave mostly accurate advice about prevention, symptoms, and testing. However, it lacked specificity in some areas, like recommending specific treatments for chlamydia. It emphasised the importance of testing and partner notification.

The researchers believe that ChatGPT could complement healthcare professionals by providing accessible information. However, they emphasise the importance of consulting a doctor for personalised advice tailored to individual circumstances. ChatGPT can offer general guidance, but human input is still crucial for a complete understanding and personalised recommendations.

Overall, this study highlights the potential of AI chatbots like ChatGPT to improve public health education and reduce vaccine hesitancy. By making accurate information more accessible, these tools could help increase vaccine uptake and promote better sexual health practices.

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