Do you have trouble concentrating or recalling information when you’re stressed or under deadline pressure? If so, you’re not alone. It happens to everyone at one time or another, from students to professionals, elite sportspersons to military personnel.

Stress forces the brain into alertness overdrive to deal with unexpected situations in what it perceives to be a hostile environment, be it an exam hall, boardroom, stadium or conflict zone.

The situation may vary, but everyone’s physical and emotional response is the same. Fear takes over the amygdala, the area in the brain that controls emotion and motivation. Neurotransmitters carry the fear impulse from the amygdala to the sympathetic nervous system, which controls the body’s ‘fight or flee response’, which kicks into action by diverting the blood away from the brain to the muscles, and releasing hormones like adrenaline that push up blood pressure, heartbeat and breathing to physically prepare the body to confront the crisis.

As the body takes charge to fight or flee in order to survive, memory and attention falter.

Since we can’t wish away stressful situations or allow our minds to wander just when we need them functioning at their best, we have to learn how to control this. Two new studies involving India, one using meditation and the other teaching adults to read, show that the brain is never too old to adapt to new tricks, and situations.

**Thought control**

Brain training can improve concentration in four short weeks, found a US study that recommends the ancient Indian technique of meditation for peak brain performance.

It found that meditation works better than online games and apps that promise to train your brain, especially in high-stress situations when memory falters and concentration dips.

Using meditation or mindfulness, where people are trained to focus attention on the present moment and dispassionately observe their thoughts and feelings, boosts concentration in high-stress situations far better than relaxation techniques, found a US Army-funded study led by University of Miami neuroscientist Amishi Jha.

The study found that in four weeks, meditation made college football players mentally and emotionally tougher and more resilient when faced with intensive academic and physical demands. Regular doses of breathing exercises and mindful-awareness sessions sustained their concentration and prevented attention lapses under duress.

The study also found that while simple relaxation exercises, place-guided imagery and music did not improve concentration, they prevented stress-related mood problems such as anxiety and depression, much like meditation does.

**Reading between the lines**

Learning a new language or simply learning how to read alters the wiring of the adult brain, noted scientists from the Max Planck Institute for Human Cognitive and Brain Sciences in Leipzig, Germany, after studying brain scans of a small group of illiterate adults taught to read and write in India.

Brain scans of 21 adults in Uttar Pradesh before and after the six-month Hindi literacy project showed an increase in activity in the cortex, the outermost layer of the brain, which is involved in learning, researchers reported in the journal *Science Advances*.
The surprise finding was that the thalamus and the brain stem, two parts of the brain not involved in learning, also showed changes, in regions that process vision. These two brain parts coordinate information from the senses, movement and environment, and get stimulated by reading and writing because these activities involve close hand-eye coordination. The most dramatic changes were seen in those people who progressed the most in their reading and writing skills, showing that practice makes perfect.

**Fighting fit**

While all types of exercise improves brain function, aerobic activity is the quickest way to boost brain power. Walking, running, cycling and other forms of aerobic exercise that push up the heart rate increase brain size and function in six months, found US researchers who used high-resolution magnetic resonance images to measure anatomical changes in the brain before and after six months of aerobic exercise four times a week.

Exercise boosts brain function by increasing blood flow, which prevents brain cells from age-related atrophy by stimulating the formation of new brain cells. Until recently this was not believed possible in adult brains.

All three studies underline the fact that the mind, like the body, needs regular exercise if it is to stay cognitively and emotionally fit.