

Health Matters

Resistance exercise to treat anxiety & depression

A new study by researchers at University of Limerick in Ireland and at Iowa State University has demonstrated the impact resistance exercise training can have in the treatment of anxiety and depressive symptoms. The new study provides evidence to support the benefits of resistance exercise training can have on anxiety and depression and offers an examination of possible underlying mechanisms. The research was carried out by professor Matthew P. Herring at University of Limerick and professor Jacob D. Meyer at Iowa State University. The researchers said there was “exciting evidence” that resistance exercise training may be an accessible alternative therapy to improve anxiety and depression like more established therapies, while also improving other important aspects of health. Herring explained: “Anxiety and depressive symptoms and disorders are prevalent and debilitating public health burdens for which successful treatment is limited. “The healthful benefits of resistance exercise training, or muscle-strengthening exercise involving exerting force against a load repeatedly for the

purpose of generating a training response, are well-established,” said Dr Herring, Associate Professor in the Physical Activity for Health Research Centre, Health Research Institute, and Department of Physical Education and Sport Sciences within the Faculty of Education and Health Sciences in UL. “However, the potential impact of resistance exercise training in the treatment of anxiety and depressive symptoms and disorders remains relatively understudied. Moreover, the plausible psychobiological mechanisms, which help us to better understand how and why resistance exercise training may improve these mental health outcomes, are poorly understood.” The researchers argue that, while the available studies in this area are focused on relatively small sample sizes, there is sufficient evidence from previous and ongoing research at UL and the National Institute of Health funded research with Dr Meyer and colleagues at Iowa State University, to suggest that resistance exercise training does improve anxiety and depressive symptoms and disorders -- though disorders themselves are scarcely studied. “There is a critical need for confirmatory,



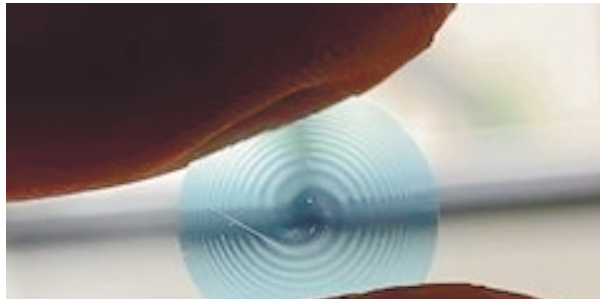
definitive trials that adequately address limitations, including small sample sizes, but the limited evidence available to us provides initial support for the beneficial effects of resistance exercise training on these mental health outcomes, including increased insulin-like growth factor 1, cerebrovascular adaptations, and potential neural adaptations influenced by controlled breathing inherent to resistance exercise,” Herring remarked. “We are tremendously excited to have what we expect to be a highly cited snapshot of the promising available literature that supports resistance exercise training in improving anxiety and depression. “Notwithstanding the limitations of the limited

number of studies to date, there is exciting evidence, particularly from our previous and ongoing research of the available studies, that suggests that resistance exercise training may be an accessible alternative therapy to improve anxiety and depression. “A more exciting aspect is that there is substantial promise in investigating the unknown mechanisms that may underlie these benefits to move us closer to maximizing benefits and to optimising the prescription of resistance exercise via precision medicine approaches,” Herring added. Professor Meyer, a co-author on the study, said: “The current research provides a foundation for testing if resistance training can be a key behavioural treatment

approach for depression and anxiety. “As resistance training likely works through both shared and distinct mechanisms to achieve its positive mood effects compared to aerobic exercise, it has the potential to be used in conjunction with aerobic exercise or as a standalone therapy for these debilitating conditions. “Our research will use the platform established by current research as a springboard to comprehensively evaluate these potential benefits of resistance exercise in clinical populations while also identifying who would be the most likely to benefit from resistance exercise.”

Spiral-shaped lens provides clear vision

Researchers have developed a spiral-shaped lens that maintains clear focus at different distances in varying light conditions. The new lens works much like progressive lenses used for vision correction but without the distortions typically seen with those lenses. It could help advance contact lens technologies, intraocular implants for cataracts and miniaturized imaging systems. “Unlike existing multifocal lenses, our lens performs well under a wide range of light conditions and maintains multifocality regardless of the size of the pupil,” said Bertrand Simon from Photonics, Numerical and Nanosciences Laboratory (LP2N), a joint research unit between the Institut d’Optique Graduate School, the University of Bordeaux and the CNRS in France. “For potential implant users or people with age-related farsightedness, it could provide consistently clear vision, potentially revolutionizing ophthalmology,” the researchers describe the new lens, which they call the spiral diopter. Its spiraling features are arranged in a way that creates many separate points of focus - much like having multiple lenses in one. This makes it possible to see clearly at various distances. “In addition to ophthalmology



applications, the simple design of this lens could greatly benefit compact imaging systems. “It would streamline the design and function of these systems while also offering a way to accomplish imaging at various depths without additional optical elements. These capabilities, coupled with the lens’s multifocal properties, offer a powerful tool for depth perception in advanced imaging applications,” said Simon. The inspiration for the spiral lens design came when the paper’s first author, Laurent Galinier from SPIRAL SAS in France, was analyzing the optical properties of severe corneal deformations in patients. This led him to conceptualize a lens with a unique spiral design that causes light to spin, like water going down a drain. This phenomenon, known as an optical vortex, creates multiple clear focus points, which allow the lens to provide clear focus at different distances. “Creating an optical vortex usually requires multiple optical

components,” said Galinier. “Our lens, however, incorporates the elements necessary to make an optical vortex directly into its surface. Creating optical vortices is a thriving field of research, but our method simplifies the process, marking a significant advancement in the field of optics.” The researchers created the lens by using advanced digital machining to mold the unique spiral design with high precision. They then validated the lens by using it to image a digital ‘E,’ much like those used on an optometrist’s light-up board. The authors observed that the image quality remained satisfactory regardless of the aperture size used. They also discovered that the optical vortices could be modified by adjusting the topological charge, which is essentially the number of windings around the optical axis. Volunteers using the lenses also reported noticeable improvements in visual acuity at a variety of distances and lighting conditions.

AI modes uses driving behaviour to detect diabetes

Based solely on driving behavior and head/gaze motion, the newly developed tool recognises low blood sugar levels. Low blood sugar levels (hypoglycemia) are one of the most dangerous complications of diabetes and pose high risk during cognitively demanding tasks requiring complex motor skills, such as driving a car. The utility of current tools to detect hypoglycemia is limited by diagnostic delay, invasiveness, low availability, and high costs. A recent study provides a novel way to detect hypoglycemia during driving. The research was the work of LMU scientists in collaboration with colleagues from the University Hospital of Bern (Inselspital), ETH Zurich, and the University of St. Gallen. In their study, the researchers collected data from 30 diabetics as they drove a real car. For each patient, data was recorded once during a state with normal blood sugar levels and once during a hypoglycemic state. To this end, each patient was deliberately put into a hypoglycemic state by medical professionals present in the car. The collected data comprised driving signals such as car speed and



head/gaze motion data -- for example, the speed of eye movements. Subsequently, the scientists developed a novel machine learning (ML) model capable of automatically and reliably detecting hypoglycemic episodes using only routinely collected driving data

and head/gaze motion data. “This technology could serve as an early warning system in cars and enable drivers to take necessary precautions before hypoglycemic symptoms impair their ability to drive safely,” says Simon Schallmoser,

doctoral candidate at the Institute of AI in Management at LMU and one of the contributing researchers. The newly developed ML model also performed well when only head/gaze motion data was used, which is crucial for future self-driving cars. Professor Stefan Feuerriegel, head of the Institute of AI in Management and project partner, explains: “This study not only showcases the potential for AI to improve individual health outcomes but also its role in improving safety on public roads.”

Nano-fibre bandages to heal wounds quickly

Cornell University researchers have identified a new way to harness the antioxidant and antibacterial properties of a botanical compound to make nanofibre-coated cotton bandages that fight infection and help wounds heal more quickly. The findings are especially important given the increasing prevalence of multidrug-resistant bacteria. Cotton gauze is one of the most common wound dressings; it’s inexpensive, readily available, comfortable and biocompatible. However, it doesn’t promote healing or fight infection. “Cotton alone cannot provide an answer for these complications - it needs to be biofunctionalized,” said lead author Mohsen Alishahi, a doctoral student in fiber science who works in the NanoFibers and NanoTextiles

(NanoFibTex) Laboratory. Tamer Uyar, associate professor and the lab’s director, said one of its main research interests is developing functional fibers from sustainable materials and exploring their potential applications in medical textiles and drug delivery systems. Researchers used lawsone, a red-orange compound found in henna leaves that has antioxidant, anti-inflammatory and antimicrobial properties, to boost the performance of cotton. The experimental dressing had excellent antibacterial performance against gram-negative and gram-positive bacterial species, and effectively eradicated E. coli and staph bacteria in testing. “The prolonged overuse of synthetic antibiotics in high concentrations has contributed to the rise of the deadly epidemic of multidrug-resistant



microbes,” Uyar said. “So the use of natural and potent anti-bacterials such as lawsone may serve as an alternative to synthetic anti-bacterials.” “Wound dressings should provide a suitable environment for facilitating healing and preventing infection,” Alishahi said. “Using totally natural materials such as cotton, cyclodextrin and lawsone, this dressing can

facilitate both as it has comprehensive antioxidant and anti-bacterial activity.” Alishahi said that the dressing would be particularly helpful for chronic wounds that are highly susceptible to infection, like diabetic ulcers and burns. The antioxidant and anti-inflammatory properties would also benefit more routine wounds by reducing the formation of scars.

Researchers identify way to treat genetic epilepsy

Scientists at the Francis Crick Institute have found a new treatment target for CDKL5 deficiency disorder (CDD), one of the most common types of genetic epilepsy. CDD causes seizures and impaired development in children, and medications are limited to managing symptoms rather than tackling the root cause of the disease. The disorder involves losing the function of a gene producing the CDKL5 enzyme, which phosphorylates proteins, meaning it adds an extra phosphate molecule to alter their function. Following recent research from the same

lab showing that a calcium channel could be a target for therapy for CDD, the team has now identified a new way to potentially treat CDD by boosting another enzyme’s activity to compensate for the loss of CDKL5. In research published recently, the scientists studied mice that don’t make the CDKL5 enzyme. These mice show similar symptoms to people with CDD like impaired learning or social interaction. The researchers first identified that CDKL5 is active in nerve cells in mice but not in another type of brain cell called an astrocyte.

In the nerve cells, they measured the level of phosphorylation of EB2, a molecule known to be targeted by CDKL5, to understand what happens when CDKL5 isn’t produced. Interestingly, even in mice that don’t produce CDKL5, there was still some EB2 phosphorylation taking place, which suggested that another similar enzyme must also be able to phosphorylate it. By looking at enzymes similar to CDKL5, the researchers identified that one called CDKL2 also targets EB2 and is present in human neurons. In mice without both

CDKL5 and CDKL2, the remaining EB2 phosphorylation almost fully dropped off. The researchers concluded that, although most activity comes from CDKL5, about 15% is from CDKL2, and the remaining <5% from another enzyme yet to be identified. Their research suggests that increasing the level of CDKL2 in people who are deficient in CDKL5 could potentially treat some of the effects on the brain in early development. Sila Ultanir, Group Leader of the Kinases and Brain Development Laboratory at the Crick, said, “CDD is

a devastating condition that impacts young children from birth, and we don’t know a huge amount about why losing this one enzyme is so disastrous for the developing brain. Through this research, we’ve identified a potential way to compensate for the loss of CDKL5. If we can increase levels of CDKL2, we might one day be able to stop symptoms from developing or getting worse.” The researchers are now investigating if mice without CDKL5 can be treated by stimulating their brain cells to produce more CDKL2.



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**SALE NOTICE FOR SALE OF IMMOVABLE PROPERTIES**  
E-auction sale notice for sale of immovable assets under the securitisation and reconstruction of financial assets and enforcement of security interest act, 2002 under the loan interest applicable from 07.02.2024 until payment in full with cost and charges under the **Loan Account No. 604107510619038**, due to KMBL, secured creditor from **Mrs. Veerammani N., Mr. Nagarajan T. & Mr. Naveen N.** The reserve price will be Rs. 26,10,000/- (Rupees twenty six lakh ten thousand only) and the earnest money deposit will be Rs. 2,61,000/- (Rupees two lakh sixty one thousand only) & last date of submission of end with key is 04.03.2024 up to 6.00 p.m. (ist.).  
**Property Description- Item 1:-** All That Piece and Parcel Of dindigul Town 6th ward, Neethuthuru, Old T.S.No: 999/1, New T.S.No: 2159, Dindigul Town, Nagalainkarpatt1 Sub division Dindigul Taluk, Dindigul district, Dindigul, Tamil Nadu, India, With An Extent of 1580 Sq Ft, Dindigul Registration District, Sub Registration, District, Dindigul, Town. **Boundaries: North By:** House Belongs To Balasubramani, **South By:** Municipal Vacant site In T.S.No:999/1 New, **East By:** 2nd Item In T.S.No: 999/1, **West By:** North South street In T.S.No. C. And Admeasuring East To The Northern Side, 42 Feet On The Western Side, 33 Feet On The Eastern Side And To The Total Extent Of 1580 Sqft Land With Building With All The Usual Amenities Therein The House Plot. **Item 2:-** All That Pieces And parcel Of Old T.S.no: 999/1, New T.S.No: 2159, Dindigul Town, Nagalainkarpatt1 Sub Division Dindigul Taluk, dindigul District-624001 Dindigul Tamilnadu, India, with An Extent Of 495 Sq Ft, Dindigul Registration District, Nagalainkarpatt1 Sub Registration district, Dindigul Town. **Boundaries:- North By:** House Belongs To Balasubramani, **South By:** Municipal Vacant Site In T.S.No:999/1, **East By:** T Plot Belongs To Soosai Val, **West By:** 1st Item In T.S.No. 999/1, And Admeasuring East To West 16 Feet On The Southern Side, North South 33 Feet On The Western Side, Eastern Side By 27 Feet And To The Total Extent Of 495 Sq Ft Land With Building With All The Usual Amenities Therein The House Plot.  
The borrower's attention is invited to the provisions of sub section 8 of section 13, of the sarfaesi act, in respect of the time available, to redeem the secured asset.  
Public in general and borrowers in particular please take notice that if in case auction scheduled herein fails for any reason whatsoever then secured creditor may enforce security interest by way of default through public e-auction, at the discretion of the secured creditor.  
In case of any clarification/requirement regarding assets under sale, bidder may contact to **Mr. Vishal Adisheshan (+919876896267) (+91-9152219751) & Mr. Rajender Dahiya (+91 8448264516)**.  
For detailed terms and conditions of the sale, please refer to the link <https://www.kotak.com/en/bank-auctions.html> provided in kotak mahindra bank website i.e. [www.kotak.com/en/bank-auctions.html](https://www.kotak.com/en/bank-auctions.html) or on <https://bank.auctions.in/>  
**Place: DINDIGUL Date 15.02.2024** Authorized Officer Kotak Mahindra Bank Limited