

Conclusion: The lack of standardized protocols and inconsistent methodology limit conclusions on ALS diagnosis using TMS. Furthermore, it becomes difficult to relate the impact of factors such as the onset of symptoms, affected hemisphere, and time of diagnosis with the presence/absence of hyperexcitability. Future research should focus on refining diagnostic criteria based on the standardization of corticospinal activity measurement.

Implications: The study highlights the potential of Single-Pulse TMS for early ALS diagnosis but faces limitations such as methodological heterogeneity, lack of standardized protocols, and inconsistent parameter definitions. These challenges impact result reproducibility and clinical applicability. In clinical approach, improved TMS standardization could enhance early ALS detection, optimizing patient referral for neuroprotective therapies and clinical trials. In physiotherapy, better diagnostic accuracy may guide personalized interventions, delaying functional decline.

Keywords: Motor Neuron Disease, Cortical Hyperexcitability, Neurophysiology

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VOLUNTARY EXERCISE WITH ENRICHED ENVIRONMENT REDUCES ANXIETY- AND DEPRESSION-LIKE BEHAVIOR AFTER NERVE CONSTRICTION IN FEMALE MICE

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Background: Neuropathic pain results from injuries or diseases affecting the somatosensory system, impacting 7–10% of the global population. Additionally, psychological factors such as depression and anxiety are linked to heightened pain perception. Studies using animal models with chronic sciatic nerve constriction injury (CCI) are essential for investigating its pathophysiology. Although pharmacological treatment is widely used, environmental enrichment (EE) and voluntary exercise (VE) have shown efficacy as adjuvant interventions in managing neuropathic pain, including reducing anxiety- and depression-like behaviors associated with pain exacerbation. EE provides motor, sensory, social, and cognitive stimuli, which can be enhanced by VE, consisting of voluntary physical activity performed by the animal on a freely accessible running wheel. However, few studies have compared the effects of EE alone versus EE combined with VE.

Objectives: To compare the effects of EE with or without VE on anxiety- and depression-like behavior in a neuropathic pain model induced by CCI.

Methods: Twenty female BALB-C mice aged 7–8 weeks, weighing 30–35 g, were obtained from the Instituto Evandro Chagas (IEC) animal facility after approval by the animal research ethics committee. The animals were divided into four groups: CCI, CCI + VE, CONTROL, and CONTROL + VE. All groups received EE; the CCI groups underwent nerve constriction surgery, while control groups were not

exposed to surgical intervention. Anxiety- and depression-like behaviors were assessed using the Open Field (OF) test, where animals were placed in a 30 × 30 × 40 cm apparatus for 5 minutes and filmed for later analysis. Statistical analyses included the Shapiro-Wilk normality test and one-way ANOVA with Tukey's post-hoc test, using Prism 9 software. p-values < 0.05 were considered significant.

Results: In the OF test, the CCI + VE group maintained total distance traveled like pre-injury measurements, with no significant changes over the 28-day experiment. In contrast, the CCI group showed increased immobility and progressive distance reduction on days 14, 21, and 28 (one-way ANOVA, $F(4,16) = 6.47$; $p = 0.003$). Furthermore, time spent in the corners of the apparatus increased significantly in the CCI group compared to pre-injury (one-way ANOVA, $F(4,16) = 3.34$; $p = 0.03$).

Conclusion: The combination of VE with EE enhanced the reduction of anxiety- and depression-like behaviors in mice subjected to CCI.

Implications: These findings suggest that combined non-pharmacological interventions could be promising strategies for managing neuropathic pain through reducing anxiety- and depression-like behaviors, warranting further studies to explore their mechanisms and clinical applications.

Keywords: Physical Exercise, Hyperalgesia, Nervous System

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ENRICHED ENVIRONMENT WITH VOLUNTARY EXERCISE PROMOTES SENSORY RECOVERY AFTER SCIATIC NERVE CONSTRICTION IN FEMALE MICE

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Background: Neuropathic pain results from injuries or diseases affecting the somatosensory system, impacting 7–10% of the global population. Animal models with chronic constriction injury (CCI) of the sciatic nerve are essential for investigating its pathophysiology. Although pharmacological treatment is widely used for neuropathic pain, non-pharmacological interventions such as environmental enrichment (EE) and voluntary exercise (VE) have shown promising efficacy. EE, which provides motor, sensory, social, and cognitive stimuli, can be enhanced by VE, performed in a freely accessible activity wheel. However, there is a scarcity of studies comparing isolated EE and its combination with VE.

Objectives: To evaluate the effects of EE, alone or combined with VE, on sensitivity modulation in a model of neuropathic pain induced by sciatic nerve constriction in female mice.

Methods: Twenty female BALB-C mice, aged 7–8 weeks and weighing 30–35 g, were used, acquired after approval by the animal research ethics committee. The 29-day experiment divided the animals into four groups: CCI, CCI + VE, SHAM, and SHAM + VE. All groups underwent EE, and the SHAM group consisted of animals without sciatic nerve injury. Sensitivity was assessed using the Von

Frey test, which applies stimuli with nylon monofilaments (0.05 to 300 g) to the animal's paw, with an expected response of shaking, cleaning, or lifting the paw if the stimulus is felt. Each filament was applied 10 times, and a positive result occurred when the animal responded 40% of the time to the same filament. Tests were conducted before injury and on days 7, 14, 21, and 28 post-CCI. Statistical analyses included the Shapiro-Wilk normality test and one-way ANOVA with Tukey's post hoc test, using Prism 9 software. p -values < 0.05 were considered significant.

Results: In the Von Frey sensory test, all groups showed worsened sensitivity on day 7, with no significant differences ($p = 0.89$). On day 14, the CCI + VE group improved, matching the SHAM group, while the CCI group maintained significantly worse sensitivity compared to the other groups (one-way ANOVA, $F(3,11) = 5.6$; $p = 0.001$). On days 21 and 28, the CCI group aligned with the SHAM and CCI + VE groups ($p = 0.35$).

Conclusion: VE combined with EE accelerated the recovery of the CCI + VE group, which showed a faster improvement in mechanical sensitivity starting on day 14, compared to the CCI group, which only improved from day 21 onwards.

Implications: The findings suggest that the combined intervention may be a more effective strategy for neuropathic pain modulation. Translating to clinical practice, outdoor or group exercises are recommended as a form of enrichment.

Keywords: Physical Exercise, Hyperalgesia, Nervous System

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EDUCATIONAL LEVEL AND INCOME ARE ASSOCIATED WITH KNOWLEDGE OF STROKE IN USERS OF SUS IN SOUTH OF BRAZIL

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Background: Stroke is the primary cause of disability among adults in Brazil and imposes a substantial financial burden on the Unified Health System (SUS). This burden can be alleviated through primary care preventive measures focused on identifying risk factors and early disease diagnosis. However, few studies evaluate SUS users' knowledge about stroke.

Objectives: This study aimed to assess the knowledge of stroke among the population using the SUS in the South of Santa Catarina and explore the association of educational level and income with knowledge of stroke in this population.

Methods: This cross-sectional study was conducted between January and April 2023, using a questionnaire developed by researchers which evaluated knowledge about stroke regarding signs and symptoms, pathophysiology, risk factors and sequelae. A total of 350 individuals participated. The collected data were organized and analyzed using the Statistical Package for Social Sciences (SPSS) version 22 for Windows. The chi-square test was used to assess the association between sociodemographic variables and questionnaire responses.

Results: The sample was mostly female, with a mean age of 36 ± 14.33 years, mostly white, married/stable union, with an income of 1.5 minimum wages. It was observed that most participants believed to know in about pathophysiology, signs and symptoms,

risk factors and sequelae of stroke, but few responded correctly. Among the responses that were considered adequate, it was possible to observe a significant association between education level and giving an adequate response, demonstrating that the variable education level influences the adequacy of the participant's response. It was also possible to see that individuals with lower incomes (up to 1.5 minimum wages) make more mistakes regarding the pathophysiology of stroke. When comparing income and knowledge of the signs and symptoms of stroke, it was observed that there is a tendency to be statistically significant, with individuals with lower incomes (up to 1.5 minimum wages) presenting more inadequate responses. During the analyses, it was possible to observe a statistically significant association between those who say they know the risk factors and family history of stroke ($p = 0.001$; $X^2 = 11.343$). Individuals who had a history said they knew more about the risk factors (71.3%) when compared to those who did not have a family history (53.7%). However, when evaluating only the yes answers, classified as adequate or inadequate, it was seen that this difference was not significant ($p = 0.758$; $X^2 = 0.095$), demonstrating that having a family member with stroke does not increase knowledge of the risk factors of the disease. There was also no statistically significant relationship between family history and responding adequately to the pathophysiology of stroke ($p = 0.543$; $X^2 = 0.371$), sequelae ($p = 0.678$; $X^2 = 0.172$) and signs and symptoms ($p = 0.697$; $X^2 = 0.152$).

Conclusion: This study showed that most of the interviewees do not know in general about stroke, and that lower incomes and level of education are associated with answers that are inadequate, while having a family member with stroke does not increase knowledge of stroke.

Implications: It became evident that educational interventions are essential for the general population to enhance stroke prevention and minimize its impact.

Keywords: Knowledge, Unified Health System (SUS), Stroke

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BRAIN-COMPUTER INTERFACE IN COGNITIVE REHABILITATION FOR INDIVIDUALS WITH PARKINSON'S DISEASE AND IMPROVEMENT IN OCCUPATIONAL PERFORMANCE: A PILOT STUDY

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Background: Parkinson's disease (PD) causes non-motor symptoms such as cognitive impairments, which can progress to dementia, leading to occupational performance issues. The use of a non-invasive brain-computer interface (BCI) is a promising approach in neurofunctional rehabilitation, such as the application of an upper-limb exoskeleton. Although BCI has been validated for other neurological conditions, further research is needed to investigate its impact as a