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The Effects of Different Amounts of Physical Exercise on Internal Inhibition and Drug Craving in People with Substance Use Disorders

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Editorial

Drug misuse is a worldwide issue that endangers public health and societal development. Drug addiction not only badly harms the physical and mental health of those suffering from substance-use disorders (SUD), but it also produces a slew of awful social problems that disrupt the social order. According to the data, there were 2.404 million instances of SUD in China by the end of 2018, accounting for 0.18 percent of the total population. At the moment, the globally average drug relapse rate is approximately 91 percent, with relapse rates continuing above 80 percent in nations with sophisticated drug rehabilitation techniques, such as the United States, Germany and Singapore. In China, the drug relapse rate is over 90%.

Exercise in medicine has received a lot of attention in recent years. Regular exercise has been shown in medical study and clinical practice to energize health, prevent sickness, enhance physical and mental health and increase life quality. Exercise, a green and ecologically friendly rehabilitation approach, has increasingly acquired attention in the field of drug addiction for its effectiveness in treating drug addiction. Exercise has been shown in studies to accelerate the synthesis of dopamine by promoting the expression of tyrosine hydroxylase and stimulating the expression of the dopamine receptor-coupling protein, effectively slowing down various withdrawal symptoms caused by the sharp decrease in dopamine in the body during the early stages of drug withdrawal [1].

Long-term drug use is widely recognized to substantially impair the user's cognitive executive function, resulting in aberrant activation of the prefrontal cortex and cognitive and behavioral abnormalities. Internal inhibition, as a crucial aspect of the brain's executive function, has been linked not only to the prevention and treatment of attention deficit hyperactivity disorder (ADHD), substance misuse and schizophrenia, but it has also been linked to drug cravings. In reality, following repeated drug use, drug abusers' internal inhibition rapidly deteriorated under the effect of drugs, making it difficult to resist need for drugs and the associated inclination to use drugs when they were exposed to the drug setting again [2].

Physical exercise has been proven to have a substantial correlation with internal inhibition. Hillman et al. observed that active involvement in aerobic exercise can, to some extent, restore drug abusers' poor cognitive control capacity and boost the ability to prevent the temptation to take drugs, so attaining the objective of delaying withdrawal symptoms. Roessler undertook an aerobic exercise intervention for 6 months for drug abusers, such as those using marijuana and opioids and the findings revealed that drug patients' self-control was greatly improved and drug desire was significantly reduced. Wang et al. proposed that in a methamphetamine-dependent population, acute exercise-induced inhibition augmentation was a plausible mechanism implicated in the link between acute exercise and drug seeking [3].

Zhu et al. discovered that among college students who were addicted to smoking, physical exercise might significantly lessen their need to smoke by enhancing their self-control capacity. On the other hand, there was a direct association between the quantity of physical activity and smoking dependency. Rong used functional near-infrared spectroscopy technology to perform Stroop tasks on methamphetamine addicts and discovered that both moderate- and high-intensity aerobic exercises could increase prefrontal cortex activity, but moderate-intensity effects were primarily concentrated in the right dorsolateral prefrontal cortex, whereas high-intensity exercise also enhanced nerve activation of the left DLPFC and the right ventrolateral prefrontal cortex.

This study discovered that physical activity is strongly negatively connected with drug desire in drug addicts, demonstrating that physical activity has a favorable influence on drug craving in patients with SUD, which is consistent with prior studies According to Roberts et al. more than 80% of research suggest that physical exercise can successfully reduce drug cravings in those suffering from SUD. Furthermore, past research has indicated that physical exercise has a good effect on drug appetite in addicts who use diverse types of drugs, with no difference in the effects of drug type. Linke discovered that among addicted smokers, consistent involvement in physical exercise might successfully avoid or lessen unpleasant feelings associated with quitting smoking while also decreasing the craving for cigarettes. Roessler discovered that vigorous aerobic exercise lowered drug cravings and alleviated withdrawal symptoms in marijuana and heroin users. Wang et al. discovered that three months of cycling, running, or jumping rope exercise intervention reduced methamphetamine users' drug appetite significantly [4].

Internal inhibitory force was utilized as a mediating variable in a structural equation model to investigate the association between the quantity of physical exercise, internal inhibition and drug seeking in this study. Internal inhibition was found to have a perfect mediating effect between the quantity of physical exercise and drug seeking, i.e., as the amount of physical exercise increased, addicts' internal inhibition improved and drug craving was effectively reduced. This shows that internal inhibition is a significant factor influencing drug desires in people with SUD. In reality, a vast number of studies have demonstrated that physical exercise can cause physical changes in internal inhibition-related brain areas, enhancing inhibitory control function in healthy persons.

This was a cross-sectional design research that employed questionnaires to evaluate physical exercise and the relationships between internal inhibition and drug seeking. Future study should use a more longitudinal design and more quantitative data to understand the findings presented here [5].

Conclusion

The quantity of physical activity was favourably associated to the individual's internal inhibition and negatively related to drug desire. Drug desire was adversely associated to internal inhibition. Internal inhibition completely mediated the relationship between the quantity of physical activity and drug seeking. Through the mediating variable of internal inhibition, physical exercise can alter drug desire in the individual with SUD.

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Conflict of Interest

None.

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