

Addiction: a Summary

With the new year comes resolutions - and most of the resolutions made have something to do with addiction in some way.

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A RESEARCH ARTICLE REPORTING ON:

MALDONADO, R., CALVÉ, P., GARCÍA-BLANCO, A., DOMINGO-RODRIGUEZ, L., SENABRE, E, MARTÍN-GARCÍA, E. (2021, JAN 20) VULNERABILITY TO ADDICTION. NEUROPHARMACOLOGY.

Every January 1, people make New Year's Resolutions to change themselves. Almost all New Year's Resolutions have something to do with habits, several relating to an addiction of some sort. While some combat substance abuse, addiction can come in many other varieties - whether it be screen time or junk food.

Addiction is a disorder in which a person loses the ability to stop themselves from consuming something. In this article, we will mainly be looking at substance abuse. To do this, we need to first understand neurons.

Neurons are specialized cells that make up part of our nervous system[1]. They can sense stimuli, do the necessary processing, and can move our muscles. Each neuron can receive a signal and relay the signal to the next neuron — between the end of a neuron, called the axon terminal, and the beginning of the next neuron, called the dendrites, there is a small gap, known as the synapse. When the signal has to make the jump between one neuron to the next, it utilizes neurotransmitters. When a neuron is relaying a message to the next, the electrical signal in the first neuron triggers a neurotransmitter to be released, which then crosses the synapse and is most likely received by specialized receptors called G-Protein Coupled Receptors (GPCRs). This produces an electric current to continue the signal through the next neuron.

It is these neurotransmitters that drugs affect[2]. Some addictive drugs mimic the structure of dopamine, the neurotransmitter which communicates pleasure, allowing it to enter the GPCRs and transmit a

sort of warped signal. Other addictive drugs, instead of acting as a neurotransmitter, interfere with the transporters of the already existing neurotransmitters. This causes abnormally large amounts of dopamine being released.

There are a few types of treatments for drug addiction[3]. The first type of treatment is the agonist treatment, where a substitute drug is given to the patient. This substitute mimics the addictive drug, but is less abusable. The other main treatment is an antagonist treatment, in which a substitute drug binds to the receptor but has NO effect whatsoever, completely blocking the addictive drug.

While this information mainly relates to drug addiction, similar circuitry is activated for other types of addiction[4]. When dopamine is released in the brain due to a particular activity, it reinforces the connection between that activity and pleasure. Over continuous periods of engaging in the activity, the brain releases less and less dopamine due to an increasing tolerance of that activity. However, the brain still needs the same amount of dopamine, leading to more and more time spent in that activity in order to get the same amount of dopamine. This is what leads to cravings.

From drinking addictions, spending too much time on social media, or drug addictions, many people resolve to make themselves better during the New Year. However, the hard part is sticking by it — finding other activities to enjoy yourself in and taking breaks[5] can help. Good luck on sticking to your resolution!