Prediction Model of Drug Misuse Based on Canadian Dataset

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Background:

Drug misuse is about using drugs without medical or legal guidelines. Therefore, drug misuse, dependence, and abuse, particularly of prescription drugs, is a rising concern for Rocky Mountain Poison and Drug Safety center. In this study, we are targeting important predictors of drug misuse including demographic, psychiatric, behavioral variables. More specifically, we evaluate the effects of medical cannabis, codeine, alcohol, tobacco, chronic pain, acute pain on drug misuse using data from an online cross-sectional RADARS® System Survey of Non-Medical Use of Prescription Drugs Program from September to December 2017.

Methods:

With this dataset, we applied a generalized linear model to verify the characteristics of drug, alcohol, tobacco usage on analgesics misuse. Before the computation, we construct an imputation of a logistic responsive variable for misuse of medications, where 1 for respondents self-reported misuse on prescription analgesics, 0 otherwise. In this case, we assume that all characteristics of causing the misuse have the same effect. Then, we split the data into training and testing datasets to test our model accuracy. In addition, we reordered the variables related to medication usage frequency, where larger numbers represent more frequent use.

Results:

Respondents who smoke and drink have significantly higher probability of analgesics misuse. Moreover, people who use Codeine excessively are at the greatest risk of misusing analgesics, followed by medical cannabis frequent users. However, codeine and medical cannabis appear to be interchangeable. We can see that the combination of opioids use to treat acute pain, prescription opioid use API lifetime, and frequency of Cannabis (medical marijuana) use, has a greater combined effect than the main effect estimates would suggest. Also, there's a significant interaction effect between Codeine use and Cannabis (medical marijuana) use. Lastly, people appear to have a significantly lower likelihood of using prescription analgesics after the age of 30, though the trend appears to be rising before 30s.

Discussion:

Since respondents with reported types of mental illness have a very similar level of drug use compared to others, we removed mental disorder as a factor in drug abuse in the model. Besides, by the fact that there is only one respondent within Northwest Territories (which is highly biased by the small sample size) then the geographical distribution of drug abuse was unascertained and needed further investigation. We attempted to calculate model accuracy, but the calculation was hampered by unanticipated factors.

Conclusion:

People who consume lawful substances like liquor, tobacco,medical cannabis, and codeine have a higher probability of misusing prescription analgesics. Frequent Codeine users appear to have the highest probability of analgesics misuse, followed by frequent medical cannabis users , drinkers, and smokers. However, medical cannabis appears to be substitutable with codeine and opioids when considering analgesics misuse. Lastly, the probability of prescription painkillers decreases after age 30, although the trend seems to increase before the 30s.