

Exploring the utilisation of a machine learning approach to predict outcomes of a telephone-delivered intervention for alcohol use problems

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Introduction: Telehealth has potential to overcome barriers to accessing care for alcohol use problems. Other than being considered a good fit for earlier intervention for more mild alcohol use problems, predicting response to treatment of this modality remains unknown. We explored whether a machine learning (ML) approach could identify outcome predictions from a telephone delivered intervention, Ready2Change (R2C), for use alcohol problems.

Method: The study was a double blind, randomised controlled trial. Penalised regression (LASSO; machine learning approach) was used to develop predictive profiles and the outcome measure was change (difference score) in Alcohol Use Disorders Identification Test (AUDIT) score at 3, 6, and 12 months'. Forty baseline predictors were used including demographics, alcohol use, alcohol and other drug (AOD) treatment history, psychological distress, and quality of life.

Results: Of the 344 participants, 173 (50.3%) were randomised to the R2C intervention. Participants mean age was 38.4 (SD=10.9) and had a baseline AUDIT score of 20.7 (SD=6.8). For the R2C intervention, a 6-variables predictor profile emerged at 3-months ($R^2=0.12$) with the strongest predictor being the number of AOD treatment types previously attended associated with a decrease in AUDIT ($b=-0.46$). No predictor profiles emerged at 6-months and one-variable predictor model emerged at 12-months, with age associated with increase in AUDIT ($b=0.06$).

Conclusion: Overall, these findings highlight that there was no substantive pattern or consistency of predictors for change in alcohol problem severity. These findings demonstrate the challenges in predicting outcomes of telephone-delivered treatment for alcohol use problems.

Implications for Practice or Policy: Improved prediction of client outcomes for different modalities of AOD treatment remains an important goal, with potential benefits for clients experiencing alcohol use problems, and to improve health care efficiency.

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