Evaluation of a Student-Run Smoking Cessation Program in a Dallas Homeless Population

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BACKGROUND

- Tobacco use remains the single largest preventable cause of death in the United States. *(CDC 2018)*

- Homeless men face an extremely high relative rate of smoking: up to 75% compared to the general population. (*Baggett TP, Rigotti 2010*)

- Given the high rate of smoking, homeless men face a unique public health risk (Chen et al 2016)

- In 2018, 55.1% of adult smokers attempted to quit at least once. (*Baggett TP, Rigotti 2010*)

Study aim: **To demonstrate that a smoking cessation program run by medical students may improve outcomes for a homeless men population and evaluate the efficacy of the program over time.**

High-Risk Smoking Behaviors and Barriers to Smoking Cessation Among Homeless Individuals. Joseph S Chen, Austin Huy Nguyen, Mark A Malesker, and Lee E Morrow 2016.
Centers for Disease Control and Prevention. Tobacco Use. 2018.
The Unmet Health Care Needs of Homeless Adults: A National Study. Baggett TP, Rigotti 2010

METHODS

This study was conducted among male homeless participants at Union Gospel Mission - Calvert Place in Dallas, TX. The study period extended from January 2017 to March 2020.

Program Structure
- Weekly smoking related health topic discussions led by a medical student or undergraduate volunteer facilitator
- Individual & group coaching sessions led by medical students using motivational interviewing
- Nicotine Replacement Therapy (patches, gum, lozenges) were disbursed to participants

Measures
- **Carbon monoxide levels**: a constituent of cigarettes (CO) was measured using a smoker anlyzer every week for each participant
  - 0-6 ppm (nonsmoker)
  - 7-10 ppm (light smoker/nonsmoker)
  - 11+ ppm (regular smoker)
- **Weekly Surveys**:
  - Self-reported level of addiction *(Heaviness of Smoking Index)*
 - Readiness to Quit Contemplation Ladder *1 to 10 (low to high readiness to quit; 9 or 10 represents quit)*
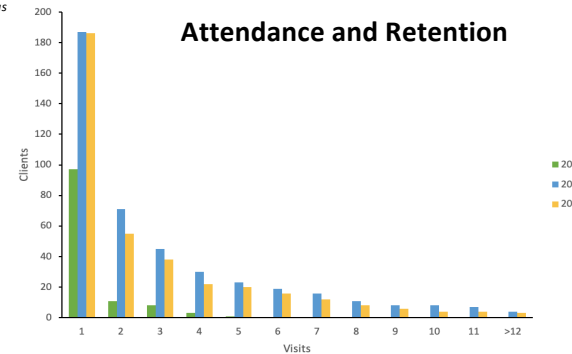
RESULTS

Readiness to Quit

* p < 0.001
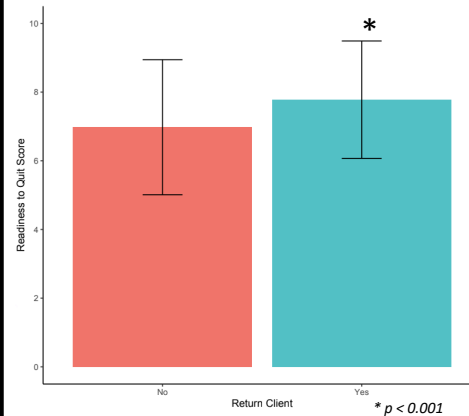
Figure 1: The readiness to quit score is derived from the readiness to quit smoking ladder, which ranges from scores of 1 corresponding to a response of "I'm not interested in quitting smoking" to a score of 10 as "I have quit smoking." New participants self-reported an average readiness to quit score of 6.98, compared to return participants, who averaged 7.78. Two tailed t-test, assuming unequal variance was performed on the data.

Carbon Monoxide Levels

** p < 0.01
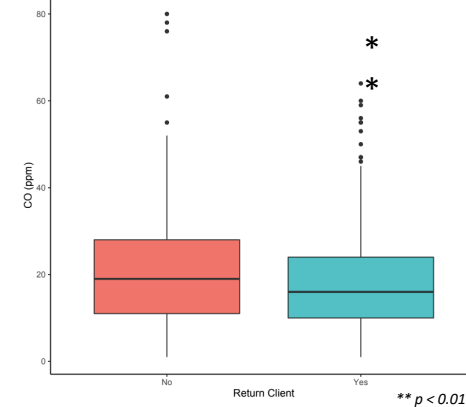
Figure 2: Average carbon monoxide levels measured among new participants was 21.6 ppm, compared to an average of 18.3 ppm among returning participants. Two-tailed t-tests assuming unequal variance showed statistical significance in the observed differences.

	Quit measured by Ladder Score	Verified with CO measure ≤ 10 ppm
Total # Quit (No, %)	37 (10.5%)	20 (5.7%)
Total # Reported Data	351	351

Figure 3: A "quit" is defined as as a readiness to quit ladder score of 9 or 10, and verified with a carbon monoxide measurement of ≤ 10 ppm. Out of 351 participants who attended the class more than once, we found that 37 self-reported a "quit" by their ladder score. Out of those, 20 could be verified by a carbon monoxide measurement of ≤ 10 ppm.

Attendance and Retention

Figure 4: Attendance data of individual participants by year was evaluated to measure retention by year. 2017 recorded the fewest number of total visits, with 120 total visits for an average of 1.24 visits per participant. 2018 showed a vast increase in the total number of visits, with 426 total visits and the retention rate of participants also increased. In 2017, out of the 97 participants who came for a first visit, only 11 (11%) returned for a second visit. In 2018, out of 187 participants who came for a first visit, 71 (38%) returned for a second visit. 2019 saw a slightly decreased total number of visits, with 395 total visits for an average of 2.14 visits per participant. The difference in the average number of participants between 2018 and 2019 was not statistically significant.

CONCLUSION

- Participant retention rates improved from previous year and may be attributed to funding for NRT, modification of curriculum, and increase in quantity and training of volunteers in motivational interviewing methods

- Increased readiness to quit among returning clients and Increased number of quits were seen, as verified by CO values

- Some lower retention in 2019 can be attributed to the transition of student leadership and new clients at the shelter

- Quit rates and reduction values may be underreported due to the transient nature of this population making follow-up difficult

- The results of this program are promising and further quality improvements should be explored to enhance efficacy

FURTHER DIRECTIONS

- Emphasis on collecting more complete and continuous data for each client by improving follow-up with past participants

- Controlling study results by comparing to non-participant smokers

- Ongoing training improvements for volunteers to improve motivational interviewing and services offered

- Standardize transition flow between student leadership from year to year and further develop volunteer training program

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