4-2014

Tobacco Treatment for Individuals with Substance Abuse and Psychiatric Disorders

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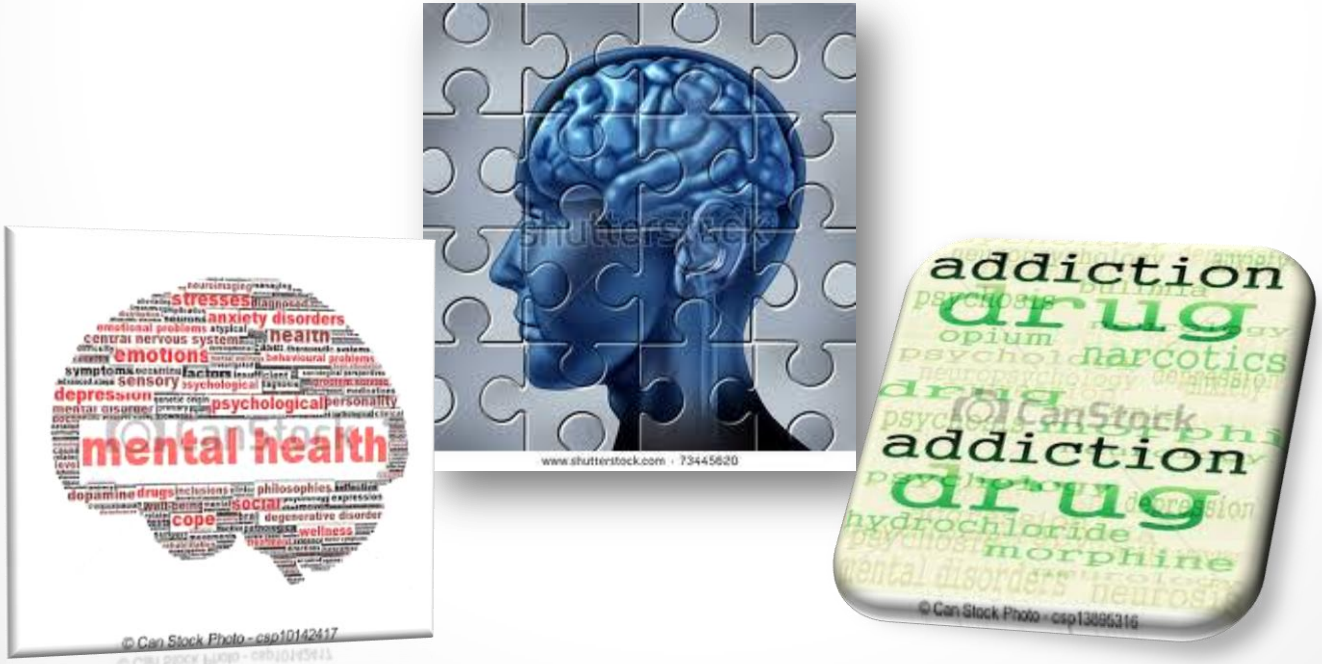
Overview

- Discuss smoking among persons with substance use and mental illness
- Present smoking cessation outcomes from an evidence-based program for persons with substance use disorders and mental Illness
- Conclusion with current and future Projects

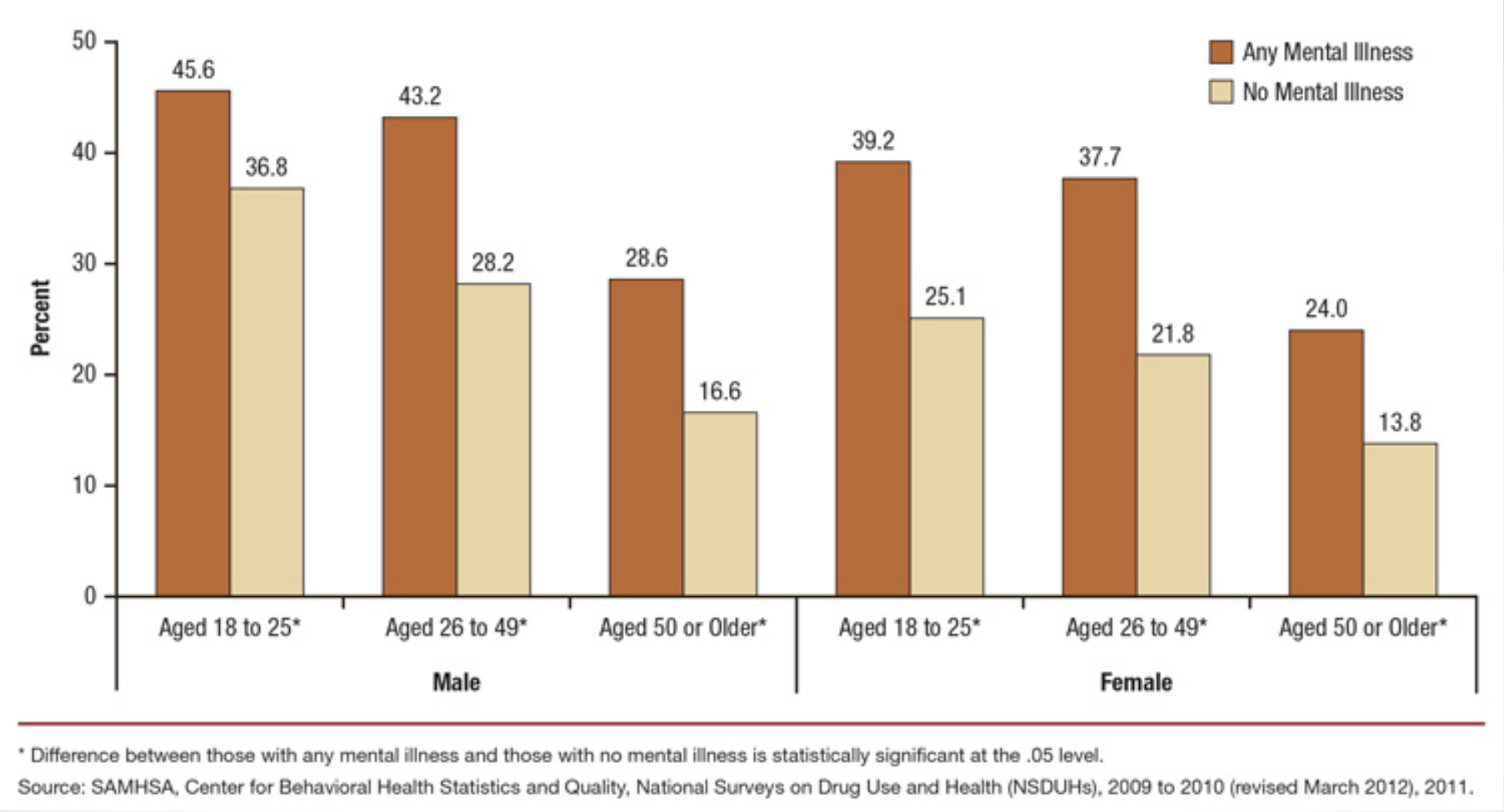
SMOKING AMONG PERSONS WITH SUBSTANCE USE AND MENTAL ILLNESS



Background and Significance

- "Nicotine-dependent individuals with a comorbid psychiatric disorder made up 7.1% of the population yet consumed 34.2% of all cigarettes smoked in the United States"

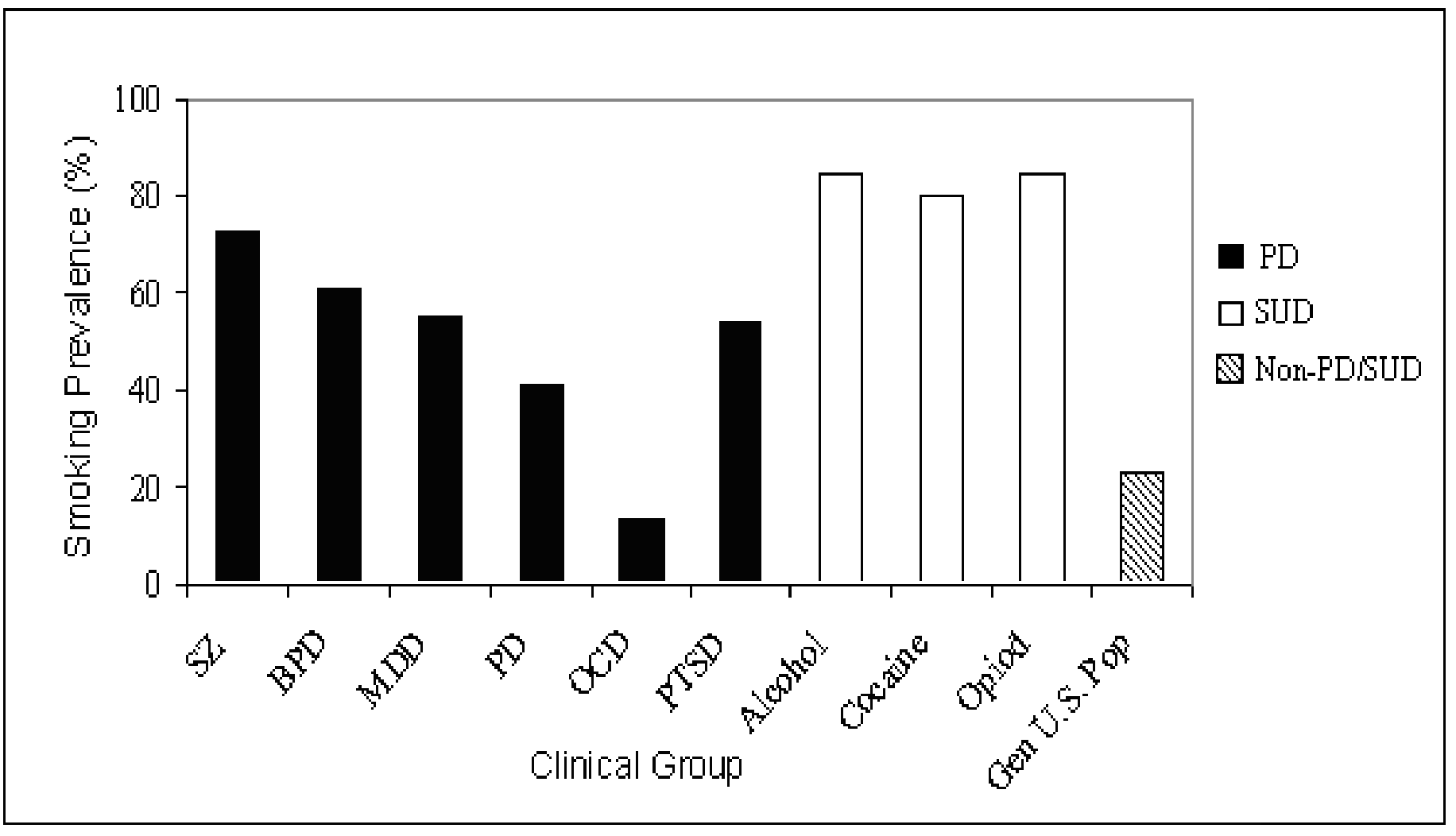
Grant, B.F. , Hasin, D.S., Chou, S.P., Stinson, F.S.& Dawson, D.A. (2004). Nicotine dependence and psychiatric disorders in the United States: Results from a national epidemiologic survey on alcohol and related conditions. Archives of General Psychiatry,61,1107-1115.



* Difference between those with any mental illness and those with no mental illness is statistically significant at the .05 level.

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Surveys on Drug Use and Health (NSDUHs), 2009 to 2010 (revised March 2012), 2011.

Past Month Cigarette Use among Adults Aged 18 or Older, by Any Mental Illness in the Past Year and Gender, by Age Group: 2009 to 2011



Kalman, Morissette and George (2005), Am. J. Addict., 14: 106-123

Health effects of smoking among persons with mental illness

Smokers with Mental illness :

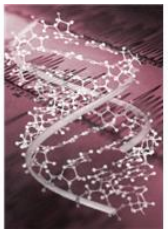
- Die 10 years earlier
- Have more depression and anxiety
- Have more substance use problems
- Have more chest and heart problems
- Are more likely to commit suicide
- Have sexual problems

Nonsmokers with Mental illness :

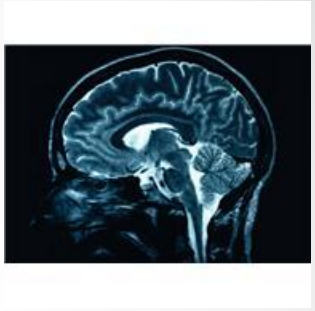
- Have better health
- Live longer
- Need less medication
- Have less depression
- Save more money

Reasons for smoking among individuals with substance use disorders and mental illness

- Genetic

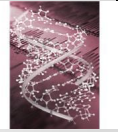


- Bio-behavioral



- Psychosocial

Smoking and substance use: Genetic



Familial Transmission of Substance Dependence: Alcohol, Marijuana, Cocaine, and Habitual Smoking

A Report From the Collaborative Study on the Genetics of Alcoholism

Laura Jean Bierut, MD; Stephen H. Dinwiddie, MD; Henri Beg
Victor Hesselbrock, PhD; John I. Nurnberger, Jr, MD, PhD; Be
Marc A. Schuckit, MD; Theodore Reich, MD

Common Genetic Vulnerability for Nicotine and Alcohol Dependence in Men

William R. True, PhD, MPH; Hong Xian, PhD; Jeffrey F. Scherrer, MA; Pamela A. F. Madden, PhD; Kathleen K. Bucholz, PhD; Andrew C. Heath, DPhil; Seth A. Eisen, MD, MSc; Michael J. Lyons, PhD; Jack Goldberg, PhD; Ming Tsuang, MD, PhD, DSc

- Both common and specific addictive factors for alcohol, marijuana, cocaine, and habitual smoking transmitted in families
- This specificity suggested independent causative factors for the development of each substance dependence
- 68% of the association between nicotine and alcohol dependence explained by shared genetic effects.

Bierut LJ, Dinwiddie SH, Begleiter H, et al. Familial Transmission of Substance Dependence: Alcohol, Marijuana, Cocaine, and Habitual Smoking: A Report From the Collaborative Study on the Genetics of Alcoholism. Archives of General Psychiatry 1998; 55:982-988
True WR, Xian H, Scherrer JF, et al. Common Genetic Vulnerability for Nicotine and Alcohol Dependence in Men. Archives of General Psychiatry 1999; 56:655-661

Smoking and mental illness: Genetic

(1,566 female twin pairs) average life time daily cigarette consumption was found to be associated with life time prevalence of major depression, ***suggesting that the relationship between smoking and major depression resulted solely from genes which predispose to both conditions***.

(8,169 male twins) shared genetic factors ***further explain the relationship between major depression and nicotine dependence***.

Kendler KS, Neale MC, MacLean CJ, et al. Smoking and Major Depression: A Causal Analysis. Archives of General Psychiatry 1993; 50:36-43
Lyons M, Hitsman B, Xian H, et al. A twin study of smoking, nicotine dependence, and major depression in men. Nicotine & Tobacco Research 2008; 10:97 - 108

Smoking and mental illness: Genetic

A Twin Registry Study of the Relationship Between Posttraumatic Stress Disorder and Nicotine Dependence in Men

Karestan C. Koenen, PhD; Brian Hitsman, PhD; Michael J. Lyons, PhD; Raymond Niaura, PhD; Jeanne McCaffery, PhD; Jack Goldberg, PhD; Seth A. Eisen, MD; William True, MD; Ming Tsuang, MD

- 63% of the association between post traumatic stress disorder and nicotine dependence co-morbidity explained by shared genetic effects.

A Novel Permutation Testing Method Implicates Sixteen Nicotinic Acetylcholine Receptor Genes as Risk Factors for Smoking in Schizophrenia Families

Stephen V. Faraone[a,b] Jessica Su[b] Levi Taylor[c] Marsha Wilcox[c]
Paul Van Eerdewegh[c,d] Ming T. Tsuang[a,b,c,e]

- A group of candidate genes and individual genes found among individuals with schizophrenia significantly linked to smoking behaviors.

Koenen KC, Hitsman B, Lyons MJ, et al. A Twin Registry Study of the Relationship Between Posttraumatic Stress Disorder and Nicotine Dependence in Men. Archives of General Psychiatry 2005; 62:1258-1265
Faraone et al. (2004). A novel permutation testing method implicates sixteen nicotinic acetylcholine receptor genes as risk factors for smoking in Schizophrenia families

Smoking and substance use: Bio-behavioral

Marijuana use reduces cessation of tobacco smoking in adults

Ford, Vu, Anthony. (2002) Drug and Alcohol Dependence; 67:243-248

Nicotine increases alcohol self-administration in non-dependent male smokers.

Barrett,Tichauer, Leyton, et al. (2006). Drug and Alcohol Dependence; 81:197-204

Increases in methadone dose could increase nicotine craving and cigarette consumption for individuals with opioid-dependence

Story & Stark. (1991). Journal of psychoactive drugs, 23:203-215

Cigarette smoking primes the brain to cocaine use

Levine et al. (2011). Science translational medicine, 3, 107, 107-109

Smoking and mental illness: Bio-behavioral

Nicotine reduces sensorimotor gating deficits in smokers with schizophrenia

Postma et al. (2006). Psychopharmacology, 184: 589–599

Brain levels of monoamine oxidase A (MAO-A) (an enzyme associated with depression) were reduced in smokers relative to nonsmokers; suggesting that people with affective disorders may smoke to reduce elevated MAO-A levels in the brain

Fowler, Volkow, Wang, et al. (1996). Proceedings of the National Academy of Sciences of the United States of America, 93:14065-14069

Smokers with a primary diagnosis of anxiety disorder reported greater levels of general anxiety, distress, and depression as compared to nonsmokers.

McCabe, Chudzik, Antony, et al. (2004). Journal of Anxiety Disorders, 18:7-18

Substance use and Smoking: Psychosocial

- Tobacco use may foster the use of other substances; and vice versa
  - Drug treatment centers may provide an environment that supports tobacco use or a factor for delayed tobacco use cessation.
- Factors such as neighborhood disadvantage and early exposure to substance use may present an 'exposure opportunity' for subsequent substance use.

Glautier S, Clements K, White JAW, et al. Alcohol and the reward value of cigarette smoking. Behavioural Pharmacology 1996; 7:144-154
King AC, Epstein AM. Alcohol Dose-Dependent Increases in Smoking Urge in Light Smokers. Alcoholism: Clinical & Experimental Research 2005; 29:547-552
Friend KB, Pagano ME. Smoking initiation among nonsmokers during and following treatment for alcohol u se disorders. Journal of Substance Abuse Treatment 2004; 26:219-224
Bobo JK, Husten C. Sociocultural Influences on Smoking and Drinking. Alcohol Research & Health 2000; 24:225-232
Crum RM, Lillie-Blanton M, Anthony JC. Neighborhood environment and opportunity to use cocaine and other drugs in late childhood and early adolescence. Drug and Alcohol Dependence 1996; 43:155-161
Wagner FA, Anthony JC. Into the world of illegal drug use: Exposure opportunity and other mechanisms linking the use of alcohol, tobacco, marijuana, and cocaine. Am. J. Epidemiol. 2002; 155:918-925

Smoking mental illness: Psychosocial

- History of tobacco use as a token economy--cigarettes used as a 'reward' for appropriate behavior (i.e., smoking privileges)

- Smoking among clients and staff to encourage 'socialization'

Kawachi I, Berkman L. Social ties and mental health. Journal of Urban Health 2001; 78:458-467
Lawn S. Cigarette smoking in psychiatric settings: occupational health, safety, welfare and legal concerns. Australian and New Zealand Journal of Psychiatry 2005; 39:886-891
Keizer I, Eytan A. Variations in Smoking during Hospitalization in Psychiatric In-Patient Units and Smoking Prevalence in Patients and Health-Care Staff. International Journal of Social Psychiatry 2005; 51:317-328
Morisano D, Bacher I, Audrain-McGovern J, et al. Mechanisms underlying the comorbidity of tobacco use in mental health and addictive disorders. Canadian Journal Of Psychiatry. Revue Canadienne De Psychiatrie 2009; 54:356-367

Arguments for Not Providing Tobacco Treatment….

"these patients don't want to quit"

- However….80% of participants in a methadone maintenance program and 75% of participants in an alcohol abuse program endorsed a desire to quit

(Richter KP et al., 2001; Ellingstad TP et al, 1999)

- In a review of 9 studies of motivation to quit smoking among individuals with psychiatric disorders at least 50% are contemplating cessation

(*Siru, Hulse & Tait, 2009).*

"these patients will relapse (to other substances) if they try to quit"

- Smoking cessation related to IMPROVED QUALITY OF LIFE

- Meta-analysis (n = 19 studies) of smoking cessation among individuals in addiction treatment and recovery found that smoking cessation efforts can ENHANCE rather than compromise long-term sobriety

Bobo JK, McIlvain HE, Lando HA, et al. Effect of smoking cessation counseling on recovery from alcoholism: findings from a randomized community intervention trial. Addiction 1998; 93:877-887

McCarthy WJ, Zhou Y, Hser YI, et al. To smoke or not to smoke: Impact on disability, quality of life, and illicit drug use in baseline polydrug users. Journal of Addictive Diseases 2002; 21:35-54

Lemon SC, Friedmann PD, Stein MD. The impact of smoking cessation on drug abuse treatment outcome. Addictive Behaviors 2003; 28:1323-1331

Mc Carthy WJ, Collins C, Hser YI. Does cigarette smoking affect drug abuse treatment? Journal of Drug Issues 2002; 2:61-80

Prochaska JJ, Delucchi K, Hall SM. A meta-analysis of smoking cessation interventions with individuals in substance abuse treatment or recovery. Journal of Consulting and Clinical Psychology 2004; 72:1144-1156

"these patients are unable to quit"

- Meta-analysis (n = 19 studies) of smoking cessation among individuals in addiction treatment and recovery found increased cessation at end of 12 weeks treatment

  (Prochaska JJ et al, 2004).

- Another recent study found end-of-treatment (between 8 to 26 weeks) smoking cessation rates of 40% among individuals with SUD and/or PD who completed an intensive tailored smoking cessation intervention that provided no-cost pharmacotherapy combined with behavioural counseling

  (Khara and Okoli, 2011)

Barriers to facilitating tobacco treatment

- **Concerns that smoking cessation will increase psychiatric symptoms or relapse among patients.**
  - Among individuals with depression, smoking cessation related to **increased depression symptomatology**, which is one of the symptoms of the nicotine withdrawal syndrome
  - individuals with anxiety disorders and depression report **more severe withdrawal symptoms**
  - smoking is associated with improvements in prepulse inhibition and sensory gating which may be affected by smoking cessation

- **Smoke-free policy and mental health facilities**

  - a review of studies examining prohibitions of smoking in psychiatric facilities suggests that **prohibitions do not have long-term effects on behavioral unrest or noncompliance**, but **neither do they appear to effect smoking cessation**

Patten C, Martin J. Does nicotine withdrawal affect smoking cessation? Clinical and theoretical issues. Annals of Behavioral Medicine 1996; 18:190-200

Breslau N, Kilbey MM, Andreski P. Nicotine withdrawal symptoms and psychiatric disorders: findings from an epidemiologic study of young adults. American Journal of Psychiatry 1992; 149:464-469

Adams CE, Stevens KE. Evidence for a role of nicotinic acetylcholine receptors in schizophrenia. Frontiers in Bioscience 2007; 12:4755-4772

Kumari V, Postma P. Nicotine use in schizophrenia: The self medication hypotheses. Neuroscience & Biobehavioral Reviews 2005; 29:1021-1034

el-Guebaly N, Cathcart J, Currie S, et al. Public health and therapeutic aspects of smoking bans in mental health and addiction settings. Psychiatr Serv 2002; 53:1617-1622

Ziedonis DMa, Williams JMb. Management of smoking in people with psychiatric disorders. Current Opinion in Psychiatry 2003; 16:305-315

Costs associated with smoking cessation treatment

- Even though **less expensive than purchasing cigarettes**, the cost of pharmacotherapy and counseling presents an important barrier to seeking treatment

- Such cost barriers to accessing treatment and the potential cost-effectiveness of treatment have prompted guidelines about **reducing medication costs** (reduced cost or free of charge), **inclusion of medications as benefits on drug insurance plans**, and **setting up systems for reimbursement for tobacco cessation treatment** for health care providers.

Bansal MA, Cummings KM, Hyland A, et al. Stop-smoking medications: Who uses them, who misuses them, and who is misinformed about them? Nicotine & Tobacco Research 2004; 6:303-310

Reilly P, Murphy L, Alderton D. Challenging the smoking culture within a mental health service supportively. International Journal of Mental Health Nursing 2006; 15:272-278

Fiore M, Jaén C, Baker T, et al. A Clinical Practice Guideline for Treating Tobacco Use and Dependence: 2008 Update: A U.S. Public Health Service Report. American Journal of Preventive Medicine 2008; 35:158-176

Raw M, McNeill A, West R. Smoking cessation: evidence based recommendations for the healthcare system. British Medical Journal 1999; 318:182-185

Smoking Cessation Outcomes of an evidence-based program for individuals with Substance Use Disorders and Mental Illness

Program Overview

- 24-26 weeks (8 weeks structured, up to 18 weeks of support)
- Tailored pharmacotherapy for up to 26 weeks at no cost
- Program is run with a team of nurses, counsellors, respiratory therapists, Occupational therapists, and a physician

TREATMENT PHILOSOPHY

Smoking cessation is a ‘process’ not an event. Hence the program has no specific ‘quit date’. Also the program employs the concept of ‘titration-to-effect’ in which increasing doses of nicotine replacement therapy is provided until the behavior of smoking ceases.

Criteria

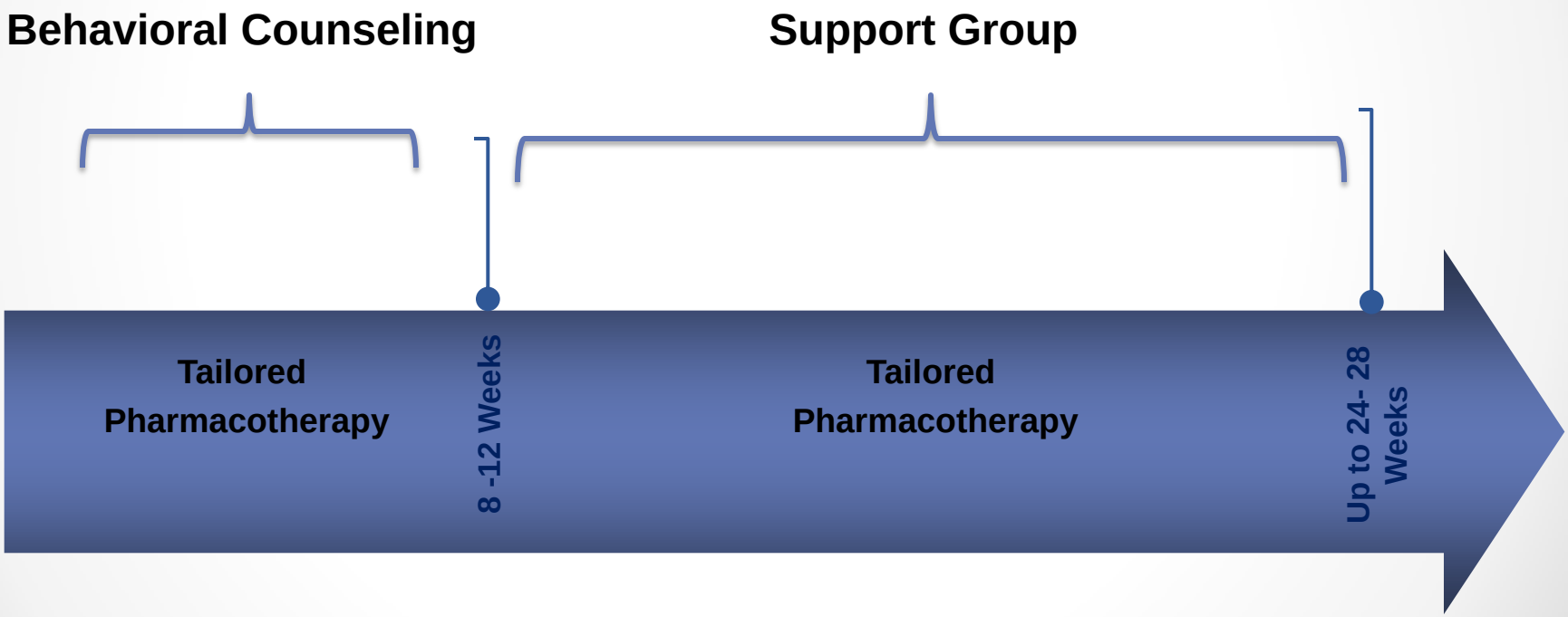
Eligibility:

- 19 years or older
- Tobacco dependent
- Have a history of substance use disorder (SUD) and/or psychiatric disorder (PD)
- Financially disadvantaged

Assessment:

- 1 hour evaluation of medical, psychiatric, substance and tobacco use history
- Expired air CO is determined and a treatment plan is developed in consultation with client

Phases of Treatment



Behavioural Counseling (Weeks 1-8)

- **Phase 1:** engagement in the process – weeks 1-2
- **Phase 2:** planning for change – weeks 3-4
- **Phase 3:** sustaining change – weeks 5-8

Combination Pharmacotherapy

Nicotine Replacement Therapy

Patch

Gum

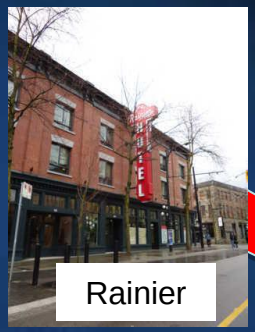
Lozenge

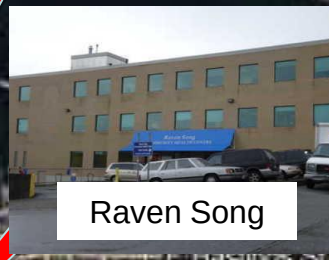
Inhaler

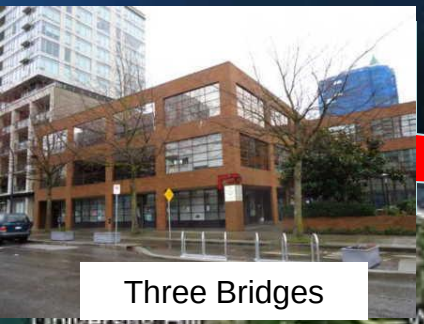
Oral Medications

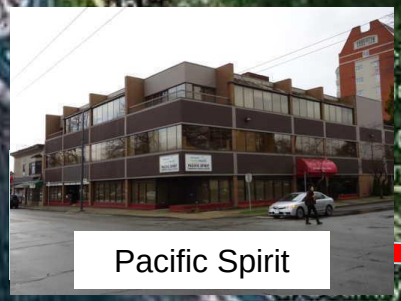
Zyban

Champix









Greenbelt
Marine Dr
1A
99
English Bay
Gastown
E Hastings St
99A
Clark Dr
Main St
Yaletown
Jericho Park
Kitsilano
W 4th Ave
Alma St
W Broadway
7
1A
University Endowment Lands
W 16 Ave
Mt Pleasant
99A
Vancouver
King Edward Ave W
Granville St
Queen Elizabeth Park
Kingsway
W 41st Ave
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SW Marine Dr
W 49th Ave
Oak St
Cambie St
Point Grey Golf & Country Club
Nanaimo St
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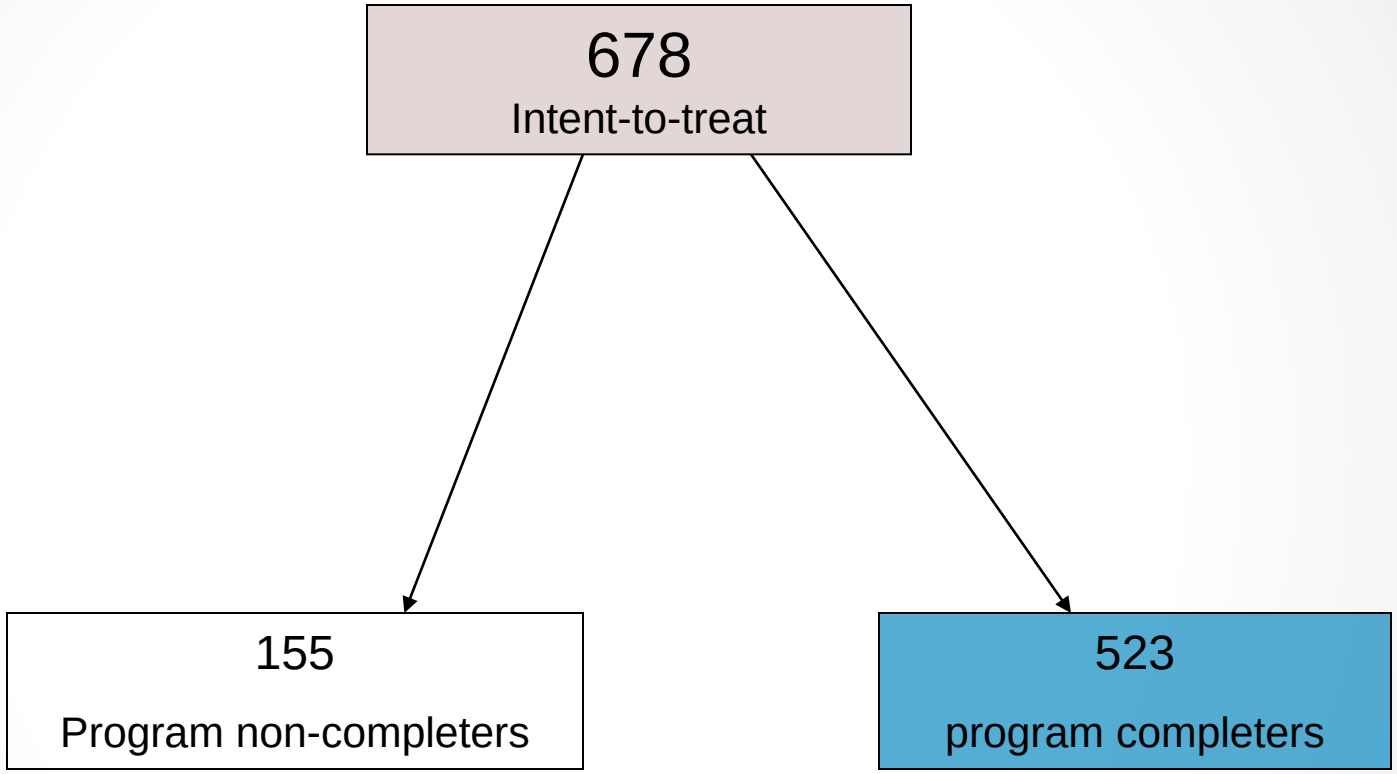
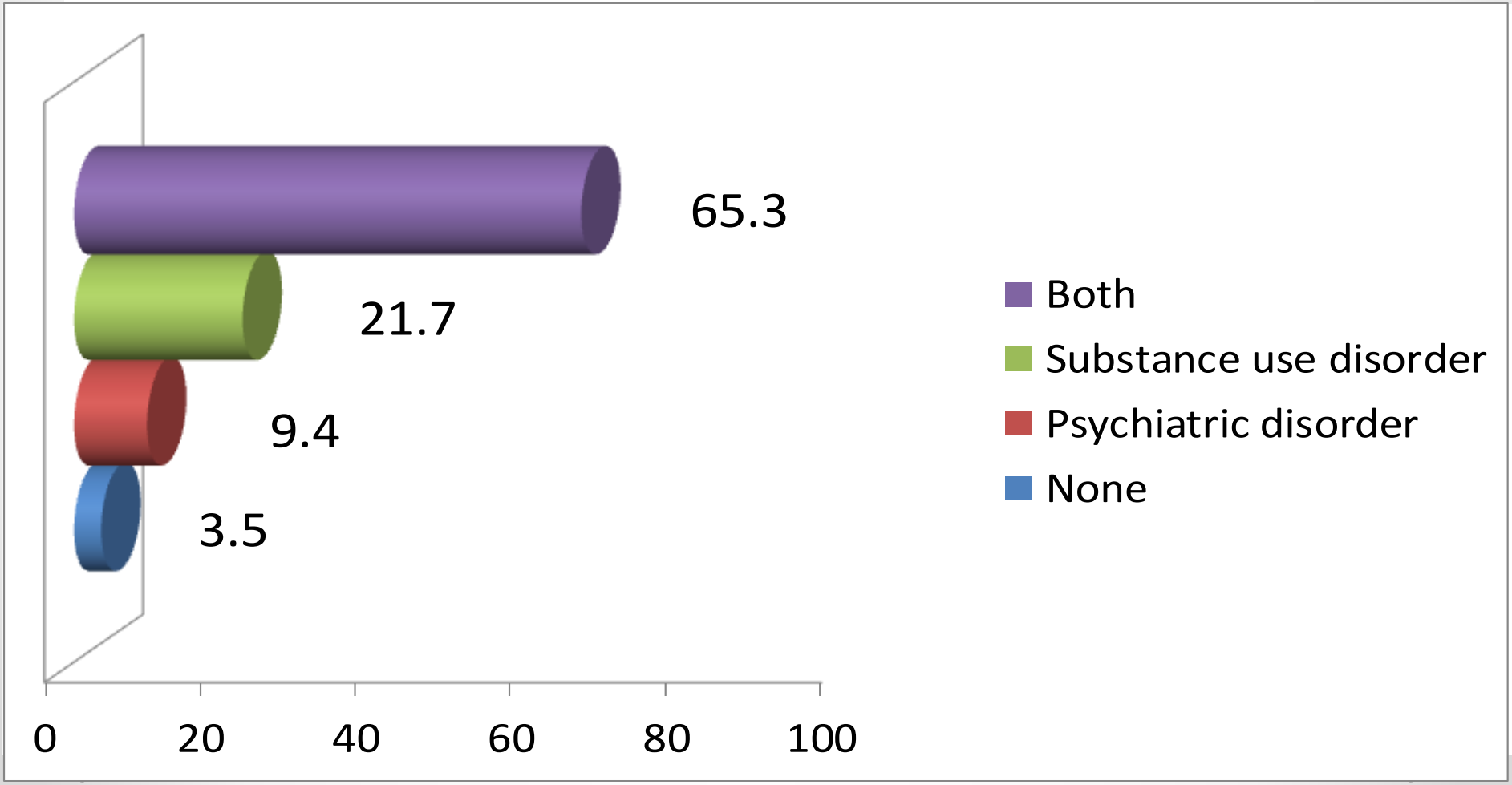
Sample for Evaluation



- Analysis is based on a retrospective chart review of participants in the TDC program (between Sept 2007 and Dec, 2011) from 7 clinics, in Vancouver, Canada
- Smoking cessation: 7-day point-prevalence of abstinence at end of treatment (i.e., anytime between 8 weeks to 26 weeks) verified by expired CO levels

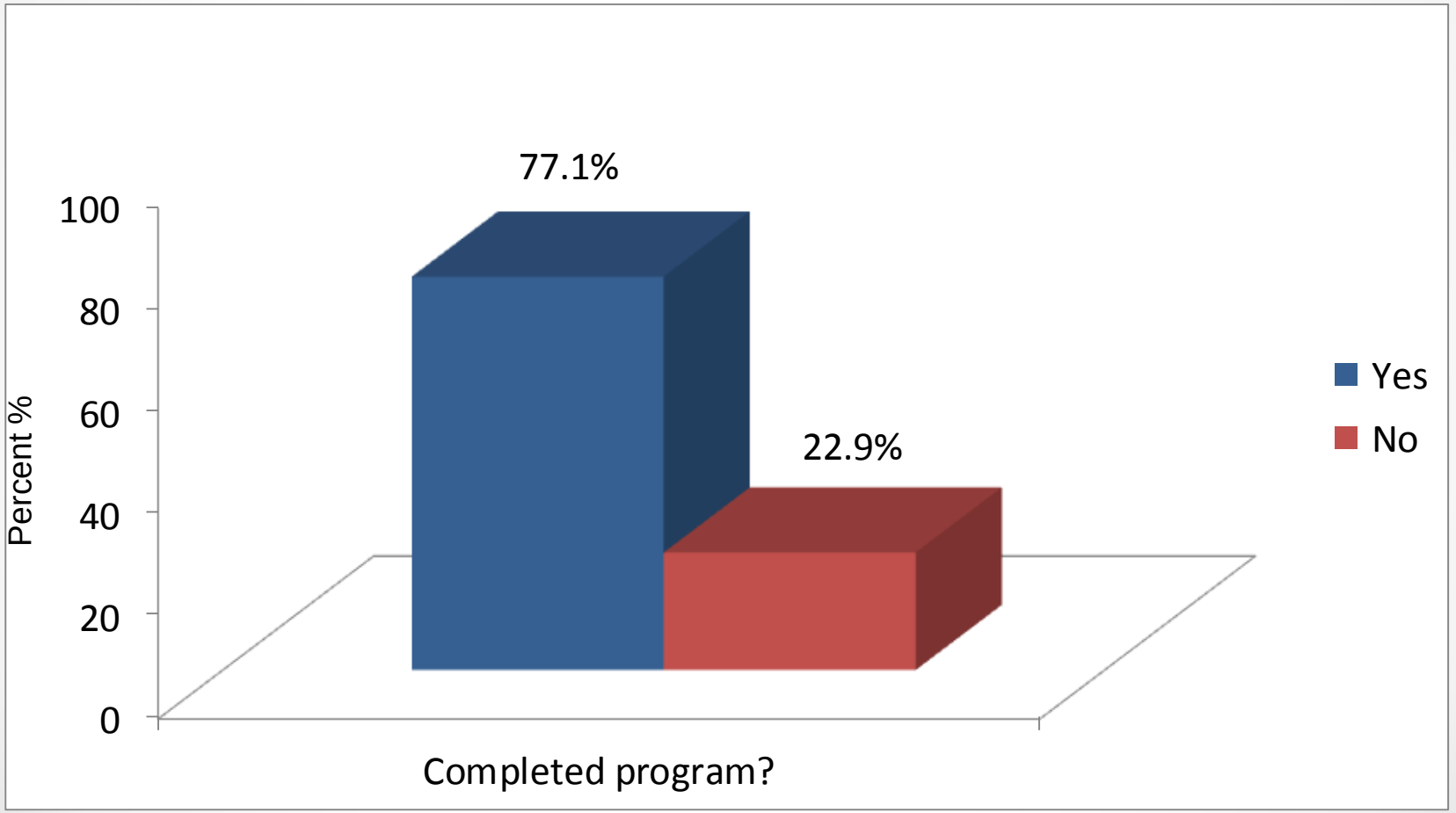
Substance Use Disorder & Psychiatric Disorder History (N = 678)



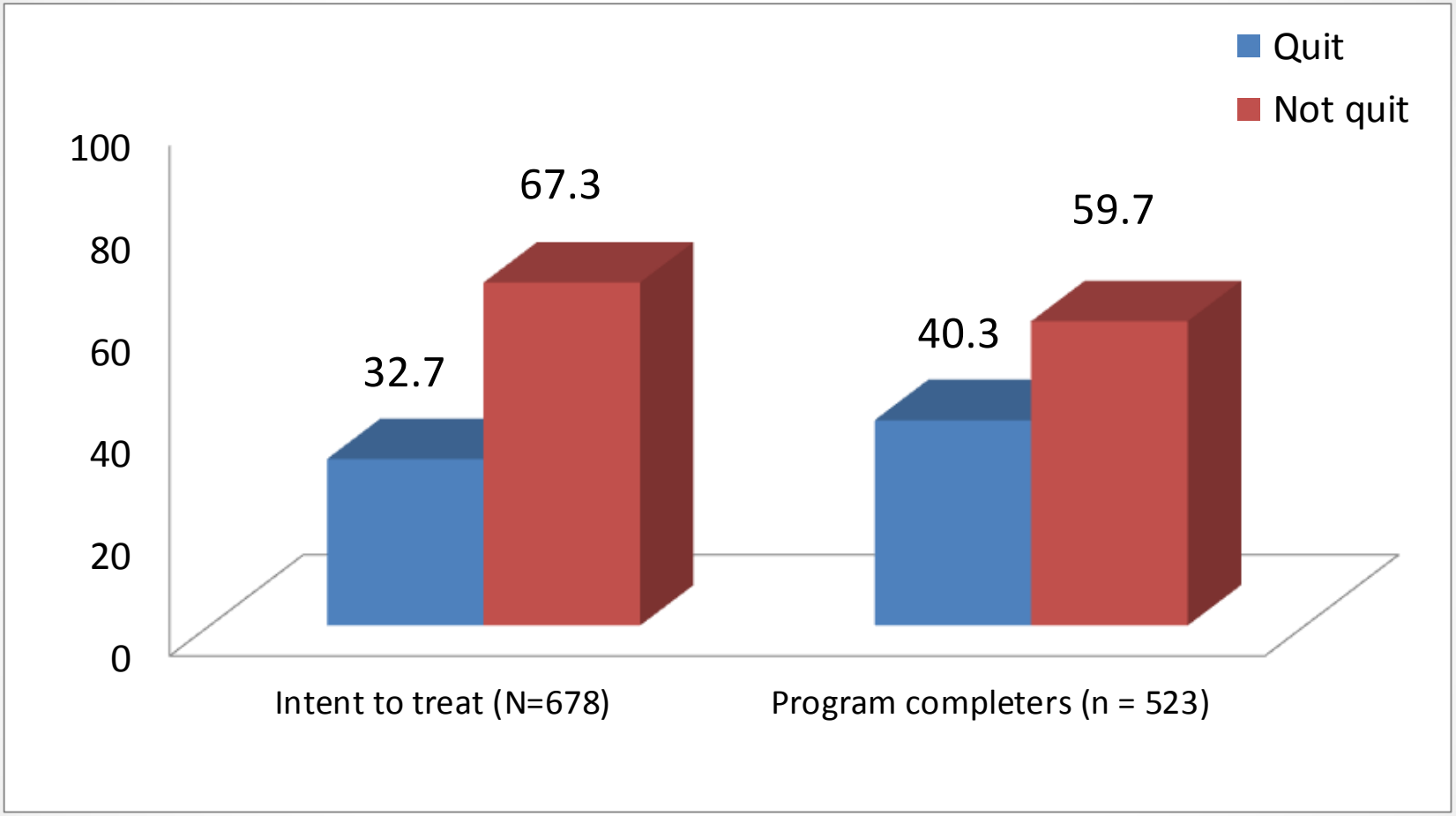
Sample Characteristics (N = 678, 57% male)

	Mean	Stand. Dev.
Age of participant (years)	48.0	11.0
Age at smoking initiation (years)	15.1	5.8
Importance of quitting (scale of 0 'low' to 10 'high')	9.0	1.4
Confidence in quitting (scale of 0 'low' to 10 'high')	7.2	2.4
Number of cigarettes smoked per day	20.4	10.3
Fagerstrom Test for Nicotine Dependence (scale of 0 'low' to 10 'high')	6.0	2.0
CO level at baseline (ppm)	20.9	14.2

Program Completion (n = 523/678)

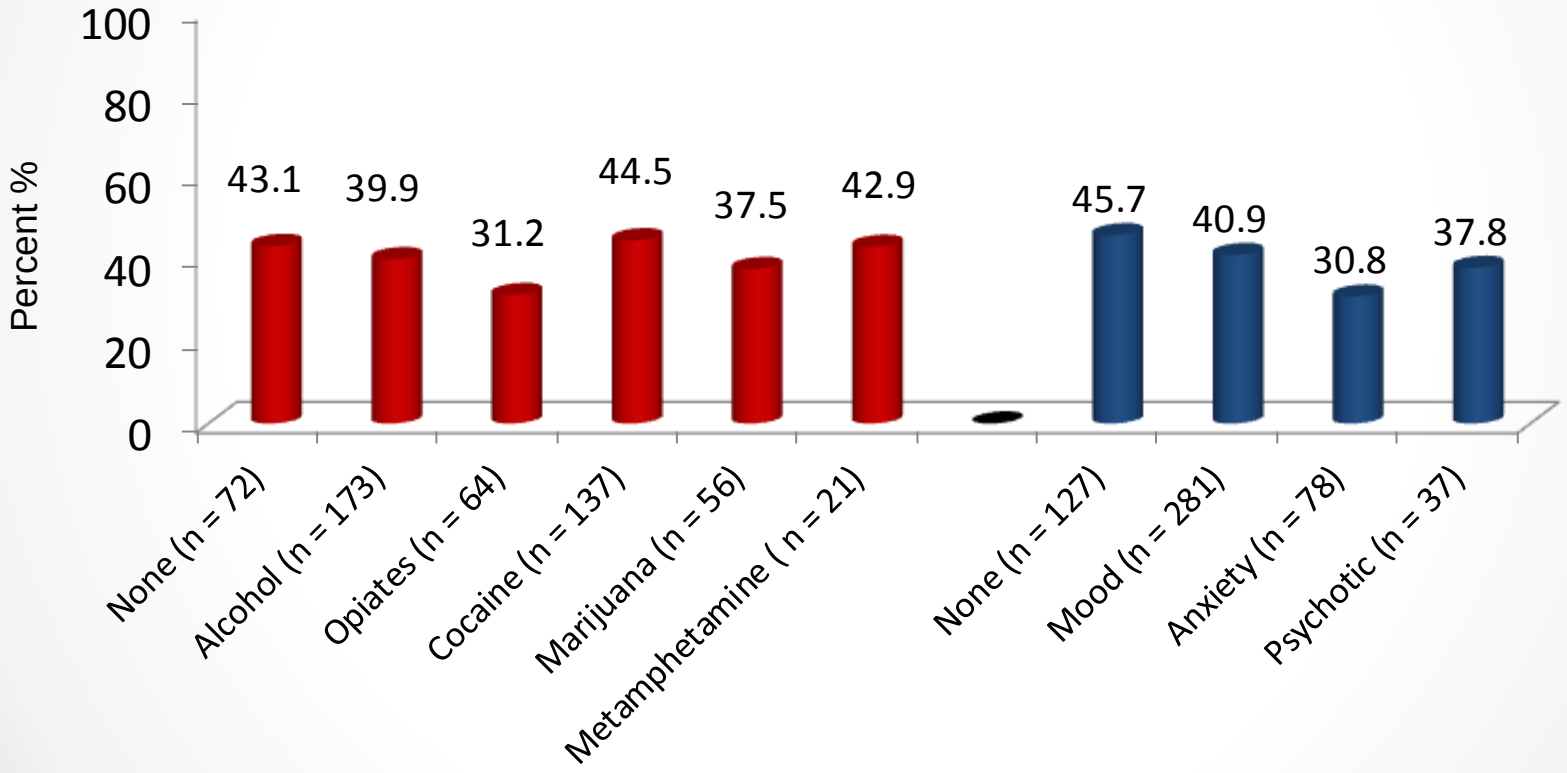


Smoking Cessation* Outcomes at end-of-treatment



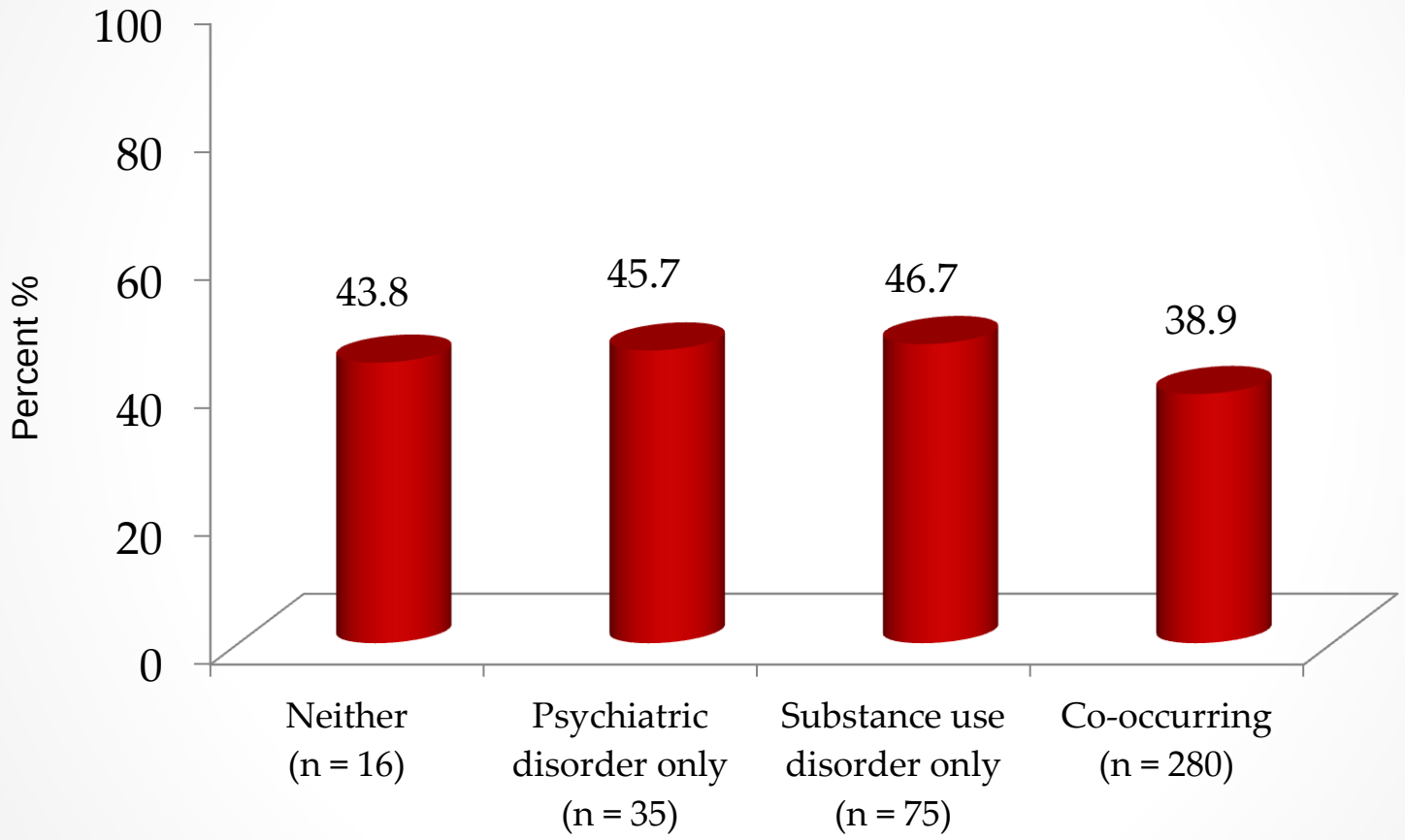
*Smoking cessation at end-of-treatment (i.e., anytime between 8 weeks to 26 weeks) verified by expired CO levels

Smoking cessation by SUD and PD among program completers (n = 523)*



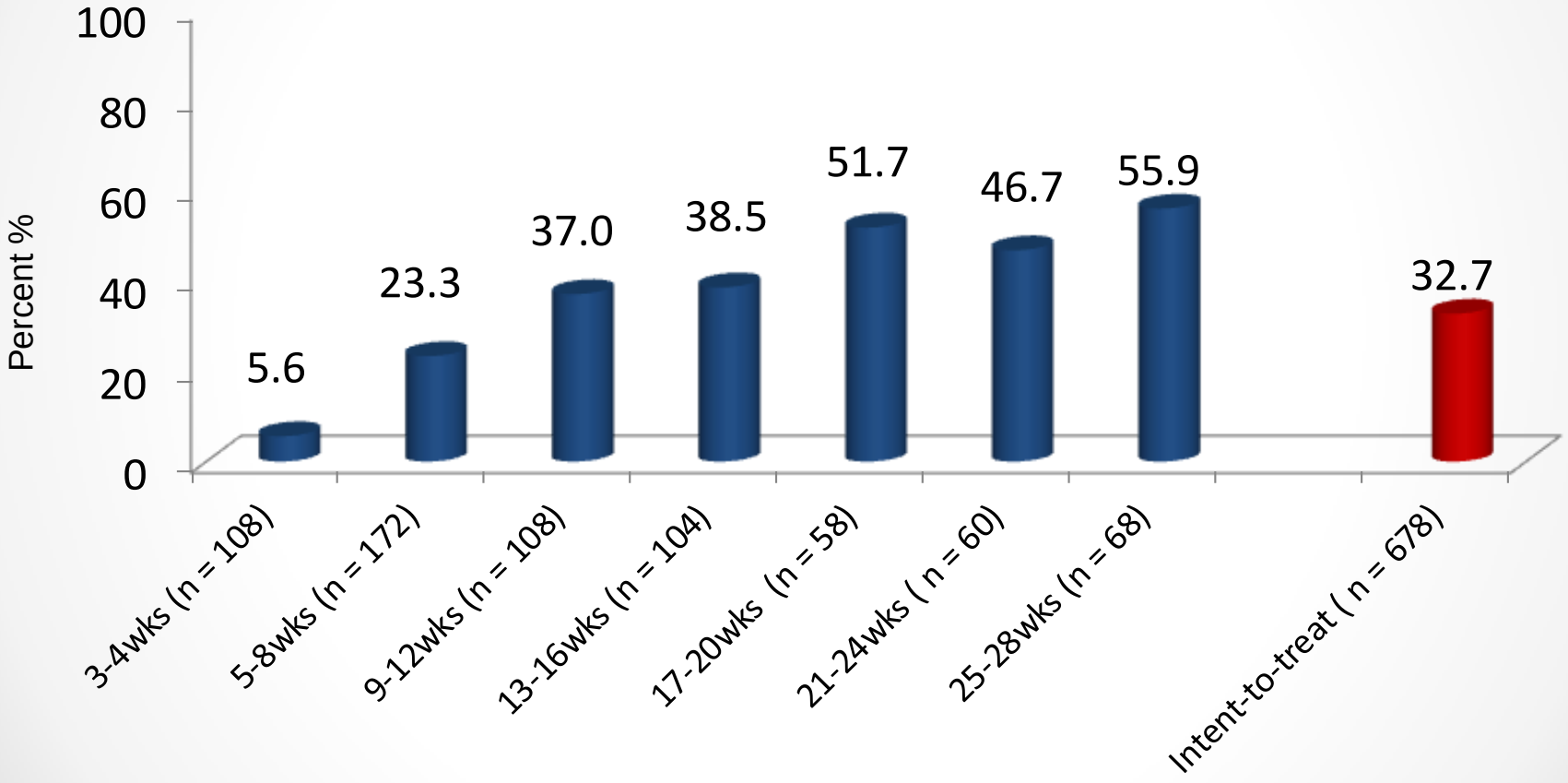
* No statistically significant differences between groups

Smoking cessation by Co-occurring Disorder history (among program completers)*



* No statistically significant differences between groups

Smoking Cessation by length of stay in the program (n = 678)*



Multivariate predictors[a] of program completion (n = 674)

Predictors	Odds Ratio	95%CI
Gender Male (referent) Female	 1.0 1.78**	 - 1.19-2.65
Age	1.03**	1.01-1.05

Hosmer-Lemeshow goodness-of-fit: χ^2= 1.80 (DF=8), p=.986

a. Employing a two-step model building process in which variables associated with smoking cessation (at alpha < 1.0) in the unadjusted analyses are included in a second-step for adjusted analyses. Only variables which were significantly predictive of smoking cessation in the final adjusted multivariate model are shown.

* = p <.05, ** = p <.001, *** = p <.001

Multivariate predictors[a] of smoking cessation among program completers at end of treatment (n = 494)

Predictors	Odds Ratio	95%CI
History of Psychiatric Disorder		
None (referent)	1.0	-
Mood disorder	.90	.57-1.42
Anxiety disorder	.53*	.29-1.00
Psychotic disorder	.69	.31-1.57
FTND at baseline	.89*	.80-1.00
Number of Visits to the TDC	1.07***	1.04-1.10

Hosmer-Lemeshow goodness-of-fit: χ^2= 3.45 (DF=8), p=.903

a. Employing a two-step model building process in which variables associated with smoking cessation (at alpha < 1.0) in the unadjusted analyses are included in a second-step for adjusted analyses. Only variables which were significantly predictive of smoking cessation in the final adjusted multivariate model are shown.

* = p <.05, ** = p <.001, *** = p <.001

Conclusions

- *With intensive tobacco dependence treatment provided within Mental Health and Addictions services, individuals with a history of substance use disorders and mental illness are able to achieve smoking abstinence.*

- *Tobacco treatment should include best practices using behavioural counseling combined with pharmacotherapy.*

- *Treatment durations beyond 12-weeks should be considered to maximize effectiveness of programs*

Current and Future Projects

- **Current projects:**
  - Smoking Cessation Program among Individuals with Mental Illness (PARTICIPATION STATION- a peer led mental health support program in Lexington KY)
  - Developing a tailored tobacco dependence treatment intervention for individuals with Schizophrenia

- **Future Projects:**
  - Examining the effect of different tobacco products on nicotine dependence, symptoms severity, and smoking cessation among individuals with mental illnesses.
  - Examining barriers and opportunities to engagement and provision of tobacco treatment within mental health treatment facilities

Questions??