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## Purpose

The purpose of this pilot study was to determine the relationship between physical activity, carbon monoxide levels, and level of nicotine dependence in a sample of women with substance use disorders who participated in a novel program for perinatal tobacco cessation, Get Fit and Quit (GFAQ). The GFAQ program incorporates comprehensive tobacco cessation education with physical activity and group support to assist women to quit smoking.



## Specific Aims

- Aim 1**
- To compare participant levels of nicotine dependence and carbon monoxide before and after implementation of GFAQ.
- Aim 2**
- To assess smoking behaviors, including quit rates, among GFAQ participants.
- Aim 3**
- To describe participant self-efficacy for physical activity before and after implementation of GFAQ.

## Significance

- Kentucky leads the nation in perinatal tobacco and opioid use (CDC, 2014).
- To date, there are no current perinatal tobacco treatment programs for women with SUD that have reported participant cessation success.
- Smoking is the leading modifiable risk factor for reducing adverse birth outcomes, such as preterm birth and low birth weight (CDC, 2014).
- Physical activity interventions have been shown to decrease adult participant cigarette cravings and increase their confidence with quitting smoking (Ussher, 2012).
- A period of intense physical activity has been shown to decrease tobacco cravings and improve outcomes in temporary smoking cessation (Prapavessis, 2014).

## Methods

### Design

- This was a preliminary analysis of a pilot study examining the impact of using the novel GFAQ program to help women of childbearing age (including pregnant women), who live in a residential substance abuse treatment facility, quit smoking.
- Participant eligibility included :
  - Women of childbearing age (18-45), including pregnant women (<30 weeks gestation and approved by provider to participate)
  - Current use of cigarettes (100 cigarettes in lifetime and any cigarettes in the past 30 days)
  - Current resident in the local substance abuse treatment program
  - Contemplation, Preparation, or Action Stage of Readiness in Transtheoretical Model

### Data Collection

- Data was collected at three study time points: enrollment, Session 5 (5 weeks), and Session 10 (6 months, study conclusion).
- Fagerstrom Test for Nicotine Dependence (FTND) was administered to evaluate nicotine dependence.
- Expired Air Carbon Monoxide (EACO) was measured utilizing a Bedfont PiCO+ Smokerlyzer.
- NicAlert™ strips were used to validate urine cotinine level (>100 ng/mL to confirm smoking status).
- Participants self-reported their measures of smoking behavior and physical activity:
  - Smoking frequency (hours/day, days/week)
  - Physical activity (regular activity)
  - Exercise self-efficacy (changes in confidence)

**Table 1. Demographic characteristics of study sample at baseline (N=23)**

Characteristic	Mean (SD); range or n (%)
Age	28.7 (5.8); 20 - 43
Race	
White	21 (91.3%)
Other	2 (8.7%)
Partner status	
Married or living with a partner	3 (13.0%)
Not partnered	20 (87.0%)
Education	
Less than high school	3 (13.0%)
High school graduate/GED	11 (47.8%)
More than high school	9 (39.1%)
Employment status	
Employed part time	4 (17.4%)
Unemployed	19 (82.6%)
Pregnant	
Yes	5 (21.7%)
No	18 (78.3%)

## Methods Continued

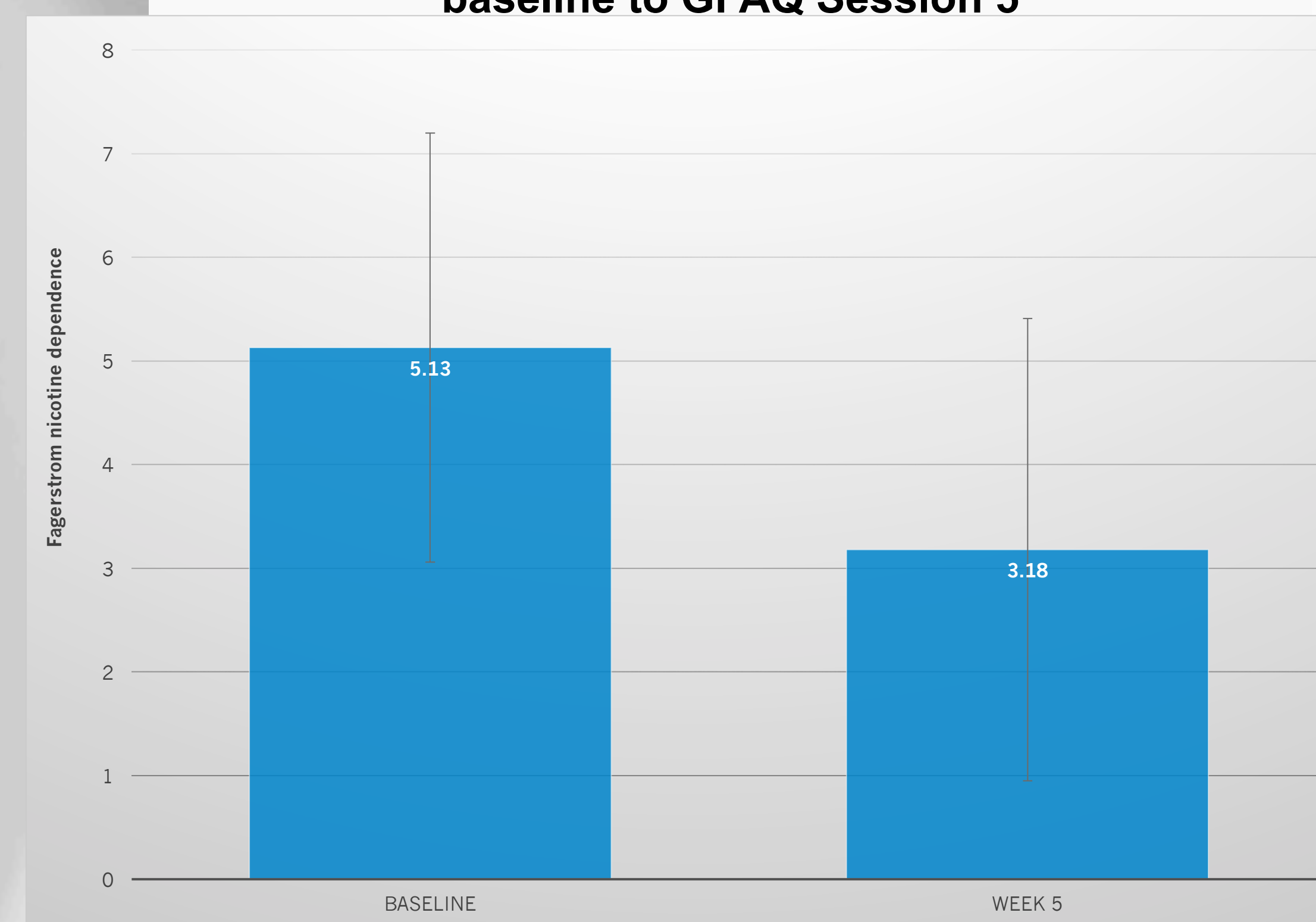
### Analysis

- Descriptive statistics, including mean and standard deviation or frequency distribution, were used to summarize study variables.
- Paired t-test was used to evaluate changes in nicotine dependence and CO level from baseline to 5-week session and at study conclusion.
- Paired t-test was used to evaluate self-efficacy for physical activity from baseline to 5-week session. McNemar's tested for difference in regular physical exercise over time.
- All data analysis conducted used SAS version 9.4 with  $\alpha = .05$ .

## Results

- Twenty-three women, including 5 pregnant women, enrolled in the study. The majority of participants were white, not-partnered, had at least a high school education, and were unemployed. See Table 1.
- Among the eleven participants who finished the study, nicotine dependence was significantly lower ( $p=0.004$ ) at GFAQ session 5 compared to scores at baseline, based on the FTND scores.
- There was no significant difference in CO levels between baseline (mean= 10.3) and session 5 (mean= 10.6); however, levels were lower at study conclusion (session 10).
- There was no significant difference in self-efficacy measures for participants' physical activity over time ( $p=.28$ ); however, 3 of the 6 participants who reported no physical activity at baseline reported engaging in regular physical activity by session 5.
- Two participants successfully quit conventional cigarette use by study conclusion as evidenced by self report and validated by NicAlert and EACO values.

**Figure 1. Comparison of nicotine dependence from baseline to GFAQ Session 5**



**Figure 2. Fagerstrom Survey Questions**

PLEASE TICK (✓) ONE BOX FOR EACH QUESTION		
How soon after waking do you smoke your first cigarette?	Within 5 minutes	<input type="checkbox"/> 3
	5-30 minutes	<input type="checkbox"/> 2
	31-60 minutes	<input type="checkbox"/> 1
Do you find it difficult to refrain from smoking in places where it is forbidden? e.g. Church, Library, etc.	Yes	<input type="checkbox"/> 1
	No	<input type="checkbox"/> 0
Which cigarette would you hate to give up?	The first in the morning	<input type="checkbox"/> 1
	Any other	<input type="checkbox"/> 0
How many cigarettes a day do you smoke?	10 or less	<input type="checkbox"/> 0
	11 - 20	<input type="checkbox"/> 1
	21 - 30	<input type="checkbox"/> 2
	31 or more	<input type="checkbox"/> 3
Do you smoke more frequently in the morning?	Yes	<input type="checkbox"/> 1
	No	<input type="checkbox"/> 0
Do you smoke even if you are sick in bed most of the day?	Yes	<input type="checkbox"/> 1
	No	<input type="checkbox"/> 0
Total Score		
SCORE	1- 2 = low dependence 3-4 = low to mod dependence	5 - 7 = moderate dependence 8 + = high dependence

## Discussion

- The results of this preliminary analysis support GFAQ as a feasible program.
- Of the 11 participants who completed the study, two successfully quit, highlighting the efficacy of this program.

## Clinical and Future Recommendations

- Women with substance use disorders who wish to quit smoking may see benefit in using daily physical activity as a positive replacement for their smoking behavior.
- Future studies are warranted to determine if a smoking cessation intervention that incorporates physical activity would be feasible and successful in a population of women of childbearing age who do not have a substance abuse disorder.

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