

# Truck Drivers' Cigarette Smoking and Preferred Smoking Cessation Methods

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## ABSTRACT

**INTRODUCTION:** Some studies show that truck drivers use tobacco and other stimulants to stay awake as they drive. Despite their increased risks for many of tobacco-related health disparities, there is limited engagement of truck drivers in smoking cessation programs. The objective of this study was to describe smoking characteristics and identify their preferred smoking cessation methods among truck drivers.

**METHODS:** This was a cross-sectional mixed methods study. Participants were truck drivers recruited at trucking companies in Utah in 2019. Participants were either individually interviewed ( $n=4$ ), or filled out a survey ( $n=33$ ). We conducted qualitative data analysis of the interviews followed by descriptive statistics of smoking and cessation characteristics from the survey.

**RESULTS:** Reasons for smoking included, staying awake, stress reduction, or something to do while driving. Of the drivers surveyed, 68.8% were daily smokers while 97% had smoked at least 100 cigarettes in their life time. The mean number of cigarettes per day (cpd) was 15.7, and 25 among those who had 10 or more cpd. Sixty-one percent had made at least a quit attempt. In addition to counseling or brief advice, 68% reported interest in using Nicotine Replacement Therapy (NRT) either as gum or patch to help them quit. 21% reported interest in telephone text messaging to engage them in treatment.

**CONCLUSION:** Cigarette smoking is a public health problem among truck drivers. Our findings suggest that truck drivers are interested in quitting smoking. Evidence based interventions tailored to this population are needed to help them quit and reduce their smoking-related morbidity.

**KEYWORDS:** cigarette smoking, smoking cessation methods, truck drivers

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## Introduction

Tobacco use is the leading cause of preventable death and morbidity in the United States,<sup>1,2</sup> and a significant cause of mortality globally.<sup>2</sup> Cigarette smoking is the most commonly used form of tobacco.<sup>1,3</sup> While there have been observed declines in cigarette smoking in the general population over the last several decades,<sup>3</sup> prevalence remains high in certain occupations such as those in the service industry and blue collar workers.<sup>4</sup> Truck driving is primarily a blue-collar workers industry.<sup>5</sup> Truck driving is an occupation among those with the highest smoking rates with one study reporting that the prevalence of smoking among vehicle operators was 34% compared to 25% in the general working population.<sup>6,7</sup> Some more recent studies have reported even higher prevalence of smoking of 49.6% and 51% among long-haul truck drivers.<sup>8,9</sup>

Truck driving is considered an underserved and highest-risk occupation primarily due to the complex interaction of a number of health behavior barriers.<sup>10,11</sup> Conditions of the truck driving industry such as social isolation, excess fatigue and

stress facilitate truck drivers' substance use including alcohol and tobacco.<sup>12</sup> Drivers use psychoactive substances as a means to help reduce sleepiness, and increase willingness to work yet, these substances are known to cause harmful effects to individuals and society.<sup>13</sup> Studies show that tobacco is one of the stimulants that truck drivers use to stay awake as they drive.<sup>13,14</sup> Studies have also shown that cigarette smoking is associated with disturbances in sleep, specifically, smokers have reported having difficulties falling asleep, maintaining good sleep quality, and day time sleepiness.<sup>15,16</sup> While the focus of research on drug use and driving has been primarily on alcohol and cannabis, studies have found an association between cigarette smoking and motor vehicle crashes.<sup>17</sup> Researchers found in Ontario Canada that the prevalence of motor vehicle collisions between 2002 and 2014 was 8.6% among smokers compared to 6.5% among nonsmokers.<sup>17,18</sup> In addition to their being prone to risky lifestyles of smoking, drinking, poor diet, and increased psychoactive substance use,<sup>19,20</sup> truck drivers have an increased risk of lung cancer, prostate cancer, stomach cancer,



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cardiovascular disease, and hypertension.<sup>20,21</sup> Drivers also have an increased risk of many other health challenges which include problems such as obesity, type 2 diabetes, and stress.<sup>22</sup> Research has long established a causal link between active cigarette smoking and lung cancer, and associations with other cancers as well as cardiovascular diseases.<sup>23</sup>

Despite their increased risks for many of tobacco-related health disparities and high cigarette smoking prevalence, there is limited engagement of blue-collar workers such as truck drivers in smoking cessation programs.<sup>24</sup> The limited engagement is a gap among the blue-collar workers although research is clear that the health benefits of quitting smoking are immediate regardless of ones' age or presence of tobacco-related diseases.<sup>25</sup> Of the 44% of smokers who attempt quitting each year in the United States only 4% to 7% of them are successful to do so on their own, where a quit attempt is any attempt of a minimum of 24 hours to stop smoking.<sup>26</sup> Researchers have proposed a model for reducing tobacco use among blue-collar workers which has the goal to address the interplay between individual, interpersonal, organizational and worksite factors.<sup>6,24</sup> These factors are said to be influential in the initiation and ongoing use of tobacco products.<sup>6,24</sup> Research has shown that smoking cessation interventions are successful and effective only when tailored to the individual needs of the population in question.<sup>26-29</sup> An understanding of the unique populations' characteristics including preferred smoking cessation methods is critical for successful intervention tailoring. Our objective in this study was to conduct formative work that would inform the design and implementation of smoking cessation interventions tailored for this underserved population. Specifically, the study was conducted to determine the smoking characteristics and preferred smoking cessation methods among truck drivers who smoke.

## Methods

This was a cross-sectional mixed methods study. Study procedures were approved by the Institutional Review Board. Participants were truck drivers recruited at trucking company sites in, Utah during the months of January to July in 2019. These participants were either individually interviewed ( $n=4$ ), or filled out a survey questionnaire ( $n=33$ ). The first part of the study involved a research staff conducting individual interviews over the phone with 4 male truck drivers who smoke. The interviews lasted between 30 and 45 minutes. These interviews were recorded and later transcribed. The qualitative data from the interviews were categorized in five major themes namely, (1) reason to smoke, (2) drawbacks of smoking, (3) barriers to quitting, (4) preferred methods to quit, and (5) ideas for engagement in smoking cessation treatment. Sub themes of the participants' responses were then grouped under these major themes. Qualitative data analysis were followed by quantitative descriptive analysis of smoking and cessation characteristics from the survey data ( $n=33$ ). Variables of descriptive analysis included demographic variables, self-reported number of cigarettes smoked per day (cpd), self-reported quit attempt, and

drivers preferred cessation methods. Analyses were performed using STATA 12.0.

## Results

### Qualitative

*Reason to smoke.* While truck drivers used different phrases, their answers of why they smoke in qualitative interviews were similar and they included the themes such as, staying awake, calming or stress reduction feeling after smoking, and something to do while driving other than eating. Smoking as a means of stress reduction was emphasized by a majority of the drivers.

*Drawbacks of smoking.* Drivers did not state common drawbacks to smoking in most of the respondents however, they emphasized that smoking is costly. One driver talking about the health drawbacks said "I damage my lungs, heart, and everything else the more I smoke."

*Barriers to quitting.* Examples of responses from qualitative interviews include the following quotes:

"[I have no interest to quit in the next 6 months] . . . Well, I'm really stressed out at the moment and that would be the reason why this [smoking] is the best stress reliever I have. Video games aren't an option while I'm driving down the road."

In a follow up question to a driver with a past quit attempt the interviewer asked, "were there other things that kind of drove you back to smoking?"

The driver participant then responded "Uh, once you smoke once in your life, then you got to taste it. Every time you smell cigarette smoke you crave. You have that odor for the rest of your life and once you quit you can never forget, that smell just brings on the urge."

Other barriers to quitting included statements from truck drivers such as these, "I haven't found anything to replace smoking." Other drivers reported that they did not have the motivation or don't get any help to quit.

### Preferred methods to quit

Drivers reported that they would prefer a mix of interventions such as pharmacological, and behavioral to help increase their motivation to quit. Drivers voiced statements such as "counseling is very good too" and cell phone text messaging would be the best way to communicate "because I respond when it is convenient." Regarding NRT patches, some drivers said that higher dose patches might be very helpful.

### Ideas for engagement in treatment

When asked what it would take for him to stay in a smoking cessation program and stay quit a different driver answered "Uh, if got my spouse involved in it would probably help a lot

**Table 1.** Themes of smoking characteristics and preferred cessation methods.

REASON TO SMOKE	DRAWBACKS OF SMOKING	BARRIERS TO QUITTING	PREFERRED METHODS TO QUIT	IDEAS FOR ENGAGEMENT IN TX
Pass the time while driving You got to be doing something while driving Wanted to be cool like peers Distressing for an entire 3 minutes after a smoke The calm after you get done Keeps me awake while driving	It is costly I damage my lungs, heart, and everything else the more I smoke	So much stress that am dealing with I am so stressed, video games don't help while you drive Once you quit you can never forget the smell. It just brings the urge Haven't found anything to replace smoking Lack of motivation People don't get help to quit	Patch. Counseling is very good too. Texting is the best way because I respond when convenient Higher dose patch	A constant reminder to use the patch Eliminate cigarette smell from the driver's environment Involving my spouse a big motivator Continue to follow up with drivers and provide continued support (NRT, etc)
<b>Other Responses of Ideas for engaging drivers in cessation treatment</b>				
Daily check ins by phone, daily contact even if it is by phone text messages, AA meetings for smokers only, treatment that works, communication is key, pay drivers, combine NRT (patch) with counseling, constant information is needed, constant support to drivers is needed, talking to drivers who have quit smoking.				

more cause I could quit smoking. There's a higher chance that I would, say when I'm home."

Other drivers responded that treatments that work, daily check in by phone calls, or even by text messages would be helpful. The drivers also said that AA meetings for smokers only would also be a good thing. The drivers also said that communication is key, and that constant support to drivers which might include provision of NRT or talking to drivers who have quit is needed. These drivers further said that a combination of counseling and NRT especially the patch would go a long way to help drivers stay in cessation programs and stay quit (Table 1).

### Quantitative

Of the 33 truck drivers surveyed, 82% were males, and all surveyed had a mean age of 39.6 (range 24-61) years old. Of the drivers surveyed, 68.8% reported to be daily smokers, 15.6% reported to smoke some days, while 97% reported to have smoked at least 100 cigarettes in their life time (Table 2). The self-reported mean number of cigarettes per day (cpd) for all surveyed was 15.7, and among those who smoked 10 or less cigarettes a day mean cpd was 5.1 while those who smoked more than 10 cigarettes a day had a mean cpd of 25 with a maximum of 60 cpd. In looking at racial differences, 7 out of 11 African American participants reported smoking 10 or less cigarettes per day while only 3 out of 15 white smokers smoked 10 or less cigarettes per day. Racial differences in smoking still remained among drivers smoking more than 10 cigarettes a day where African Americans had a mean cpd of 17.5 compared to a mean of 28.3 cigarettes per day among white drivers smoking more than 10 cigarettes a day (Table 2).

Among drivers surveyed, 61% had made a smoking quit attempt at least once in the past varying from 54.6% among African Americans/blacks compared to 66.7% among whites (Table 3). On the question of how they would like to receive

support to quit smoking, drivers reported that In addition to counseling or brief advice, they would be happy to receive nicotine replacement therapy (NRT). 42% and 24.2% answered that they would prefer to use nicotine gum and nicotine patch respectively as their first choice NRT. As a second choice NRT, 41.7% prefer NRT patch, 20.8% NRT lozenge, and 16.7% NRT gum (Table 4). For their preference of behavioral interventions, 21% of the drivers would like to receive cell phone text messaging at least 3 times a week while 18% prefer a one-time 10-15 minutes brief advice to help them quit. Drivers who preferred a 20-30 minutes telephone counselling at least every two weeks as support to quit were 15% of those who participated in the survey (Table 4). Results from the qualitative interviews showed that drivers are interested in cell phone text messaging to help them quit, and even though the percentage was lower at 21.2%, those surveyed also indicated that cell phone text messaging would be a way that they would like to communicate with someone providing them help to quit.

### Discussion

The goal of this study was to describe the smoking characteristics and cessation preferred methods among truck drivers. Our findings that 97% of drivers surveyed have smoked at least 100 cigarettes in their lifetime, and that 68.8% of them are daily smokers suggest that cigarette smoking is a public health problem among truck drivers. Trucker drivers are also interested in quitting as shown by 61% having made at least a quit attempt in their life. Findings that these drivers have not succeeded in quitting are also supported by earlier reports that tobacco dependence is a chronic medical condition that requires repeated interventions and multiple attempts to treat.<sup>26</sup> Some of our study findings such as those of racial differences are similar to findings in the general population. For example our results showed that 7 out of 11 (63.6%) African Americans smoke 10 or less cigarettes per day compared to 3 out of 15 (20%) whites who smoke less or equal to 10 cpd. These

**Table 2.** Smoking categories and cigarettes per day (cpd).

VARIABLE (N=33)	YES (N)	PERCENT	NO (N)	PERCENT
Have you smoked at least 100 cigarettes in your lifetime	32	97.0	1	3.0
Do you now smoke cigarettes				
Not at all	5	15.6		
Every day	22	68.8		
Some days	5	15.6		
DRIVERS SURVEYED (N=33)	MEAN CPD	MINIMUM CPD	MAXIMUM CPD	MEAN AGE YEARS
<b>Cpd Categories</b>				
All (n=32)	15.7	0	60	39.6
≤10 (n=15)	5.1	0	10	37.7
>10 (n=17)	25	15	60	40.6
<b>Race</b>				
Other (n=6)				
≤10 (n=5)	4.2	0	10	39.2
>10 (n=1)	15	15	15	27.0
African American/Black (n=11)				
≤10 (n=7)	6.7	0	10	39.7
>10 (n=4)	17.5	15	20	39.3
White (n=15)				
≤10 (n=3)	2.7	1	6	24.0
>10 (n=12)	28.3	15	60	42.1

**Table 3.** Quit attempts among surveyed drivers.

QUIT ATTEMPT	ALL TRUCK DRIVERS N=31 [N (%)]	RACE N(%)		
		OTHER	BLACK	WHITE
No	12 (38.7)	2 (40)	5 (45.5)	5 (33.3)
Yes	19 (61.3)	3 (60)	6 (54.6)	10 (66.7)
<b>cpd≤10</b>				
No	6 (42.9)	2 (50.0)	4 (57.1)	0 (0.0)
Yes	8 (57.1)	2 (50.0)	3 (42.9)	3 (100.0)
<b>Cpd&gt;10</b>				
No	6 (35.3)	0 (0.0)	1 (25.0)	5 (41.7)
Yes	11 (64.7)	1 (100.0)	3 (75.0)	7 (58.3)

findings are in line with research in the general population where African Americans are more of light smokers compared

to whites. Light smokers are defined as individuals who smoke 10 or fewer cigarettes per day.<sup>30,31</sup> These findings are similar to other racial research results in the general population specifically that approximately 50% of African American smokers smoke 10 or less cigarettes per day.<sup>30,31</sup> In this study African Americans who smoked greater than 10 cpd, the mean cpd was 17.5 compared to the mean cpd of 28.3 among whites who reported smoking greater than 10 cpd. This emphasizes earlier findings that now the whites are heavier smokers compared to the African Americans,<sup>32</sup> even within the truck driving population. In this study, we defined smokers as having smoked at least 100 cigarettes in a lifetime, or daily or occasional smoking.<sup>33</sup>

The ecological model of health behavior suggest that for the behavior change to be effective, an individual's environment must not make it difficult for such change.<sup>11</sup> Trucker drivers' work environment is one that creates opportunities for unhealthy lifestyles,<sup>22</sup> and therefore this is critical in exploring cessation methods that would work well to assist truck drivers in their unique environment quit smoking. Interventions to

**Table 4.** Preferred smoking cessation methods among surveyed drivers.

VARIABLE (N=33)	YES (N)	PERCENT	NO (N)	PERCENT
How would you like to receive extra support to help you quit				
A one-time 10-15 minutes brief advice	6	18.2		
A 20-30 minutes phone call counselling/support talk every two weeks	5	15.2		
Communication by cell phone texting about 3 times a week	7	21.2		
None of these	12	36.4		
WHAT IS YOUR PREFERRED MEDICINE, OR NICOTINE REPLACEMENT THERAPY (NRT)		FIRST CHOICE	SECOND CHOICE	
Zyban (Bupropion or Wellbutrin)	3	9.1	1	4.2
Nicotine lozenge	1	3.0	5	20.8
Nicotine Inhaler	3	9.1	1	4.2
Nicotine Patch	8	24.2	10	41.7
Nicotine Gum	14	42.4	4	16.7

reduce the use of psychoactive substances should recognize that such use is human behavior which is difficult to change.<sup>34</sup> Similar to the general population, truck drivers prefer a combination of interventions to help them quit smoking. We found that in addition to counseling or brief advice, 66% of the drivers reported they would like to use NRT for quitting (42% nicotine gum, and 24% for the nicotine patch as their first choice NRT). This preference is in line with findings from one study that heavier smokers and nicotine dependent individuals preferred use of NRT and especially the NRT patch to help them quit.<sup>35</sup> A substantial percent of drivers (21.2%) also reported that they would prefer cellular telephone text messaging because this would allow them stay in touch with whoever is helping them quit yet respond to messages as their driving schedule permits. One study reported that tailored text messaging could have great potential in helping smokers quit yet, acceptability of interventions using text messaging is not known in certain populations.<sup>36</sup>

Truck driving is a primarily blue-collar industry,<sup>5</sup> and addressing cigarette smoking among blue-collar workers can be challenging for several reasons including a lack of smoking bans at worksites. For example, research has found that blue-collar worksites are less likely to have smoking bans than white-collar worksites yet, smoking bans at worksites has been found to influence reduced smoking.<sup>6</sup> Truck drivers are compensated by miles and hours driven, and combined with keeping tight delivery schedules this leads to many drivers driving to very close or over the maximum number of hours allowed by law.<sup>7</sup> These tight driving and delivery schedules are a source of great stress for many drivers.<sup>7</sup> Our findings are in agreement with the study finding of the major theme that drivers smoke because they want a relief to their work-related stress. When asked what could be done to help them quit smoking, one

driver responded “[I have no interest to quit in the next 6 months] . . . Well, I’m really stressed out at the moment and that would be the reason why this [smoking] is the best stress reliever I have . . .” In one study 40% of professional drivers reported a high job-related strain compared to 18% of workers in other professions.<sup>37</sup>

Our findings also showed that stress is a major link to drivers’ reasons for smoking. Other studies have shown that job stress resulting from things such as long hours, time pressures, and fast pace are directly linked to poor health behaviors such as physical inactivity and smoking especially among long-haul truck drivers.<sup>38,39</sup> Workplace health promotion activities among long-haul truck drivers have paid little attention to improving work conditions to reduce stress.<sup>38</sup> Stress has also been identified in other populations as a contributing factor to initiation and continued smoking.<sup>36</sup>

### Limitations and strengths

In line with earlier reports that truck drivers are a hard to reach or study population,<sup>12</sup> we found it difficult to retain drivers in the study. We found in agreement with a prior study that the work conditions, difficult schedules, and lifestyle of trucker drivers makes them a difficult group to follow or study.<sup>12</sup> Initially, we had 9 drivers who consented to take part in individual interviews or focus groups. Our original protocol was designed to allow drivers at least 7 days after signing the consent in case they needed to change their mind. Research staff found it extremely difficult to get hold of the original 9 for interviews or focus groups. After months of trying 4 out of the 9 drivers participated in the individual interviews. A modified survey was later created out of the individual interview and focus group moderator guides. This survey was then administered to the drivers at the same time and day they signed consent forms. Out

of the 45 drivers approached for the surveys, 33 agreed to complete the survey questionnaire. Although it was challenging to get individual interviews, drivers who participated were happy and willing to share their smoking experiences with the research staff. These limitations and strengths are a lesson that the research staff plans to use to improve the next study among this population. At the time drivers sign consent forms for the next study, they will be immediately randomized and begin cessation treatment right away. Such quick randomization will likely minimize loss to follow up in planned smoking cessation interventions.

## Conclusion

Truck drivers experience much job-related stress and as a result engage in harmful behaviors such as cigarette smoking. A meaningful proportion (68.8%) of truck drivers surveyed were daily smokers suggesting that cigarette smoking is a public health problem among truck drivers. Additionally, findings of 61% of the surveyed having made a smoking quit attempt is an indication that truck drivers are interested in quitting smoking, and interventions tailored to their needs might assist them quit. Drivers look for ways to reduce stress, and interventions that employ stress-reducing measures can be helpful in assisting drivers quit smoking.

## Authors' Contributions

RK, MST, and KO were the individuals who were involved in the conception and design of this work. RK in consultation with KO oversaw the overall study while MST directed the recruitment of truck drivers. EE, ACT, and MG administered the interviews and survey questionnaires in addition to transcribing the interviews and performing all necessary data collection. RK performed the data analysis, interpretation, and wrote the first draft of the manuscript while all the above mentioned authors proof read the manuscript and gave feedback to improve the work.

## Institution, Ethical Approval, and Consent

This work was performed at the University of Utah and the study received ethical approval from the University of Utah Institutional Review Board (IRB). The IRB approved both written and verbal consent.

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