



Trucking Organization and Mental Health Disorders of Truck Drivers

Mona Shattell, Yorghos Apostolopoulos, Chad Collins, Sevil Sönmez & Caitlin Fehrenbacher

To cite this article: Mona Shattell, Yorghos Apostolopoulos, Chad Collins, Sevil Sönmez & Caitlin Fehrenbacher (2012) Trucking Organization and Mental Health Disorders of Truck Drivers, Issues in Mental Health Nursing, 33:7, 436-444, DOI: [10.3109/01612840.2012.665156](https://doi.org/10.3109/01612840.2012.665156)

To link to this article: <https://doi.org/10.3109/01612840.2012.665156>



Published online: 03 Jul 2012.



Submit your article to this journal [↗](#)



Article views: 1078



View related articles [↗](#)



Citing articles: 22 View citing articles [↗](#)

Trucking Organization and Mental Health Disorders of Truck Drivers

Mona Shattell, PhD, RN

DePaul University, School of Nursing, Chicago, Illinois, USA

Yorghos Apostolopoulos, PhD

University of North Carolina at Greensboro, Public Health Education, Greensboro, North Carolina, USA

Chad Collins, BS

University of North Carolina at Greensboro, School of Nursing, Greensboro, North Carolina, USA

Sevil Sönmez, PhD

University of North Carolina at Greensboro, Bryan School of Business and Economics, Greensboro, North Carolina, USA

Caitlin Fehrenbacher, BSN, RN

University of North Carolina at Greensboro, School of Nursing, Greensboro, North Carolina, USA

There are over 3 million truck drivers employed in the commercial transportation and material moving occupations, one of the largest occupational groups in the United States. Workers in this large and growing occupational segment are at risk for a range of occupational health-induced conditions, including mental health and psychiatric disorders due to high occupational stress, low access and use of health care, and limited social support. The purpose of this study was to explore male truck drivers' mental health risks and associated comorbidities, using a cross-sectional and quantitative design. Data were collected from a random sample of 316 male truckers between the ages of 23 and 76 at a large truck stop located within a 100-mile radius of Greensboro, North Carolina, USA, using a self-administered 82-item questionnaire. Surveyed truckers were found to have significant issues affecting their mental health, such as loneliness (27.9%), depression (26.9%), chronic sleep disturbances (20.6%), anxiety (14.5%), and other emotional problems (13%). Findings have potential to help researchers develop interventions to improve the emotional and occupational health of truck drivers, a highly underserved population. Mental health promotion, assessment, and treatment must become a priority to improve the overall trucking environment for truckers, the transportation industry, and safety on US highways.

Over 3 million truck drivers are employed in the transportation and material moving occupations, and represent one of the

Address correspondence to Mona Shattell, DePaul University, School of Nursing, 990 W. Fullerton Ave, Chicago, IL 60614. E-mail: mona.shattell@gmail.com

largest occupational groups in the United States (Bureau of Labor Statistics [BLS], 2009a; U.S. Department of Transportation, 2010). Truck driving is one of the fastest growing occupations in the US, with a 13% projected growth of heavy and tractor-trailer drivers from 2008 to 2018 (BLS, 2010–11). Workers in this large and growing occupational segment are at risk for a range of occupation-induced conditions (Saltzman & Belzer, 2007) including mental health-related problems and psychiatric disorders due to a work environment that produces high occupational stress, low access to and use of health care, and limited opportunities for social support (Apostolopoulos, Sönmez, Shattell, & Belzer, 2010). The aim of this article is to discuss mental health-related risks inherent in the transportation environment, describe potential links between the transportation environment and truckers' mental health, mental illness, and substance use; and to examine truckers' access to mental health services. The overall goal of this paper is to provide mental health practitioners, policy makers, researchers, and government regulators the evidence needed to affect the occupational impact of the transportation environment on the mental health of truck drivers.

LITERATURE REVIEW

Truck drivers, especially those who drive long-haul routes, are faced with a multitude of mental health-related risks attributed to the transportation environment (Apostolopoulos et al., 2010). Long work hours, disrupted sleep patterns and

fatigue (Sabbagh-Ehrlich, Friedman, & Richter, 2005), spending many consecutive days away from home and family, time pressures due to demands of “just in time” (JIT) delivery requirements (Heaton, 2005), compliance with “hours of service” (HOS) driving requirements (drivers in the US are not permitted to drive more than 14 hours per day; U.S. Department of Transportation, Federal Motor Safety Carrier Administration, 2010), as well as low job satisfaction and low control (Quinlan, 2010) are aspects of the transportation work environment that breed mental health-related problems. In a study of occupational stressors and the mental health of truckers with a sample of 59 male truck drivers located in an urban setting, job-related factors such as constant time pressures and social isolation were found to not only lead truckers to engage in risky behaviors (e.g., drug use and sex with sex workers) but caused them psychological strain and emotional distress (Shattell, Apostolopoulos, Sönmez, & Griffin, 2010). When psychological job strain was measured in relation to voluntary turnover among 820 Dutch truck drivers over a two-year period, researchers found that voluntary turnover and subsequent movement to any profession outside the trucking industry resulted in a large reduction in overall job-related psychological strain (De Croon, Sluiter, Blonk, Broersen, & Frings-Dresen, 2004).

Risk factors for depression were examined among 300 male truck drivers at a local truckstop in Fortaleza, Brazil (Pereira da Silva-Júnior, Nunes de Pinho, Túlio de Mello, Sales de Bruin, & Carvalhede de Bruin, 2009). Results revealed that 13.6% of truck drivers suffered from depression; further, multivariate analysis showed that low educational level, truckers’ use of stimulants, and low wages, increased risk for depression. Research suggests that drug misuse often serves as a means to combat fatigue and help truckers meet their delivery deadlines (Shattell et al., 2010). High psychological demands and lowered perceived control over one’s job were found to be related to mental health problems in a sample of 1,811 male and female participants of the general German population (Dragano, He, Moebus, Jöckel, Erbel, & Siegrist, 2008). Longer and more frequent road trips were linked with increases in depressive symptoms among a sample of 1,200 truckers in China (Wong, Tam, & Leung, 2007). In a study of hypersomnolence (excessive sleepiness) with a sample of 300 Brazilian long-haul truck drivers who were approached at a truckstop in Brazil following a 12-hour rest period, sleep deprivation emerged as a potential precursor to driver fatigue and motor vehicle accidents (Nunes de Pinho et al., 2006). This study found that multiple stressors on truck drivers placed them at increasing risk, particularly the longer they remained in the trucking work environment.

Research reveals the use of illicit and prescription drugs by truck drivers to alleviate symptoms of associated comorbidities of depression, anxiety, job strain, fatigue, and social isolation (Silva, Greve, Yonamine, & Leyton, 2003). In a study of Brazilian truck drivers, 5.63% (41 out of the 728 urine samples collected) tested positive for cocaine, cannabinoids, amphetamines, or methamphetamines. Similarly truckers are known to use al-

cohol, even during work hours. Research suggests that truckers either underestimate their own individual alcohol intake or overestimate that of other drivers (Pereira da Silva-Júnior, et al., 2009).

It is unclear how the intertwined components and underlying mechanisms of the trucking work environment trigger, exacerbate, or sustain US truck drivers’ mental health risks and associated comorbidities. Nor is it known how widespread mental health-related problems are in this occupational segment since no large scale studies have been conducted on the mental health-related problems of truck drivers. Males comprise 95% of the US truck driver population (BLS, 2009b) and comorbidities associated with mental health problems have been predominantly linked with male drivers (Apostolopoulos et al., 2010). The purpose of this study was to explore mental health-related problems of a random sample of male US trucker drivers in order to contribute to closing this gap in the literature.

METHODS

Procedures and Setting

The study used a quantitative, cross-sectional, descriptive design and was approved by the Institutional Review Board of the University of North Carolina at Greensboro. Random sampling procedures were used to recruit male truckers, 21 years of age or older, from a large truckstop located within a 100 mile radius of Greensboro, North Carolina. A member of the research team asked every fifth person who entered the truckstop an initial screening question to determine if they were a truck driver (to exclude drivers of personal automobiles). Upon identifying truck drivers, the researcher explained the purpose and nature of the study, the voluntary and anonymous nature of the trucker’s participation, and obtained written informed consent from each trucker willing to participate. Participants’ identities were kept anonymous by the use of self-identified aliases such as CB handles, street names, or nicknames on study documents. Participants were given the option of completing the self-administered paper-and-pencil survey in their truck cabs for greater privacy and were paid a \$15 cash incentive upon completion. Completed surveys were collected from 316 truckers.

Survey

The Healthy Trucker Survey (HEATS) instrument was adapted (Apostolopoulos & Sönmez, 2010) from the Truckers and Community Health Project (Apostolopoulos & Sönmez, 2004), the Work Outcome Research Cost-Benefit (WORC) Project—Valuing Healthy Employees, Health Appraisal Survey (WORC, 2001), and the WORC Health and Wellbeing Survey for the NSW Transport Industry (WORC, 2008). The HEATS instrument used in this study included 82-items organized into eight sections: demographics, professional history, health, substance use, work, health care access and treatment history, attitudes toward health, and health information and promotion.

Response sets included nominal (e.g., gender), ordinal (e.g., Likert-type), and interval (e.g., weight, height) levels of measurement, and forced choice and open choice questions (e.g., “how many visits with a health professional did you have in the past month?”).

Data Analysis

Descriptive statistics were used to determine the means, standard deviations, percentages, and frequencies of variables representing various components of the trucking environment associated with truck drivers' mental health. Skewness and kurtosis of continuous variables were evaluated through univariate analyses. Spearman's rho (for ordinal level variables) and Pearson's *r* (for interval level variables) with two-tailed tests of significance were used to investigate relationships between environment measures and mental health-related outcomes. Nominal level variables were cross-tabulated in contingency tables. Statistical analyses were performed using SPSS version 20.0 (IBM SPSS Statistics, NY).

RESULTS

Our sample included 316 male truck drivers who were between the ages of 23 and 76 ($M = 44.17$); sample demographics are displayed in Table 1. The majority of the truckers identified as white or Caucasian ($n = 232$; 73.5%); 19.2% identified as black or African American, 2.2% identified as Hispanic or Latino, and 1.9% identified as Native American. Over half of our sample finished high school or received a GED (53.2%); 30.9% attended trade school, and 2.5% had a college degree. Although truckers' incomes varied, the majority (50.3%) reported incomes between \$35,000 and \$64,000, and 24.8% reported incomes of \$65,000 or more. Over half of our sample reported being married or having a partner (55.9%); 19.5% were divorced, 16.6% had never married, 4.8% were separated, and 3.2% were widowed. Over half of the truckers had a BMI of 30 or higher. BMI calculations, which were based on reported height and weight, showed that the majority of our sample (83.4%) was overweight or obese: 53.4% of the sample had a BMI of 30 or more (obese), 30% had a BMI of 25–29.99 (overweight), and 16.6% had a BMI of less than 25 (most were normal; only .9% were underweight).

The majority of study participants were full-time (97.5%), long-haul (89.6%), commercial fleet/company drivers (61.1%) with greater than five years of trucking experience. About 41.1% had 6 to 15 years' of driving experience, 19.6% had 16 to 25 years' of driving experience, and 13.6% had greater than 26 years' of driving experience. Only 10.4% of our sample (1.6%) indicated that they were short-haul or part-time drivers. Days per month spent on the road (away from home) varied among the sample: 57% reported being on the road 22 or more days per month; 28.8% were on the road 17 to 21 days per month; and 14.3% stated that they were on the road 16 or fewer days per month. Participants worked an average of 60.84 hours ($SD =$

TABLE 1
Demographic Profile of Truckers ($N = 316$)

	Mean (<i>SD</i>)
Age (Years)	44.17 (10.71)
	Percentage
Race	
Caucasian	73.5
African American	19.2
Latino/Hispanic	2.2
Native American	1.9
Asian	0.6
Other	2.6
Marital Status	
Never married	16.6
Married	55.9
Separated	4.8
Divorced	19.5
Widowed	3.2
Income (US Dollars)	
10,000–34,000	24.8
35,000–64,000	50.3
65,000 and above	24.8
Educational Attainment	
Less than high school	9.9
High school diploma/GED	53.2
Some trade school	30.9
Some college	3.5
College degree	2.5
BMI (kg/m ²)	
Less than 25	16.6
25–29.99	30.0
30 and above	53.4

23.44) within the past week, which is only slightly less than what participants reported as their employers' expectations of number of hours worked within the past week ($M = 61.89$ hours, $SD = 22.18$) (See Table 2 for more information).

The majority of drivers (89.7%) rated their overall mental health as good, very good, or excellent; 9% rated their overall mental health as fair, and only 1.3% rated their overall mental health as poor or very poor. While drivers generally rated their overall mental health as good to excellent, when they were asked more specifically if they currently had or ever had mental health-related problems (e.g. depression, loneliness, anxiety, substance problem [drugs or alcohol misuse]), their responses were surprising. Nearly a third (27.9%) of drivers reported past or current feelings of loneliness, 26.9% reported depression, and 20.6% reported sleep problems. In addition, 18.9% reported experiencing chronic fatigue, 16.8% reported problems with substances, 14.5% reported anxiety disorders, and 13% reported “other emotional problems.” When truckers were asked if they

TABLE 2
Professional Profile ($N = 316$)

	Percentage
Years of Driving	
Less than 5 years	25.6
6–15 years	41.1
16–25 years	19.6
More than 26 years	13.6
Type of Driver	
Commercial fleet/ company driver	61.1
Owner operator/ independent driver	35.8
Other	1.9
Driving Schedule	
Full-time	97.5
Part-time	1.6
Occasional	0.9
Haul Type	
Long-haul	89.6
Short-haul	10.4
Number of Days per Trip	
Less than 4	19.0
5–10	30.8
11–16	13.3
17–21	10.8
22 or more	26.0
Number of Days on the Road per Month	
Less than 4	2.3
5–10	4.2
11–16	7.8
17–21	28.8
22 or more	57.0
Salary Type	
By the mile	67.4
By the load	25.5
Other	7.1
	Mean (<i>SD</i>)
Total Hours Worked in a Week	60.84 (23.44)
Total Hours Worked in a Month	220.36 (90.37)
Employer Expectation of Total Work Hours per Week	61.89 (22.18)

TABLE 3
Mental Health of Truckers ($N = 316$)

	Percentage
Perceived General Mental Health	
Poor–very poor	1.3
Fair	9.0
Good–very good	65.6
Excellent	23.2
Reported Mental Health Issues	
Loneliness	27.9
Depression	26.9
Chronic sleeping problems	20.6
Chronic fatigue or low energy	18.9
Substance problems	16.8
Anxiety disorder	14.5
Emotional problems	13.0
Subjective Feelings over Past Week	
Feel agitated	47.2
Hard to wind down	41.8
Find it difficult to relax	37.5
Tend to over-react	35.7
Feel intolerant of things	28.2
Feel downhearted and blue	27.7
No initiative to do things	26.1
Feel touchy	24.2
Feel there's nothing to look forward to	20.9
Unable to have positive feelings	20.5
Subjective Feelings over Past 4 Weeks	
Feel tired or have low energy	67.4
Feel fidgety	43.8
Trouble sleeping	39.3
Feel nervous	35.4
Experience headaches	33.0
Feel sad	27.6
Never Received Treatment	
Loneliness	24.7
Depression	19.0
Chronic fatigue	16.1
Sleep problems	14.9
Substance problems	11.4
Anxiety disorder	10.4
Other emotional problems	10.8

had experienced certain other health-related problems within the past 4 weeks, 67.4% reported feeling tired or having low energy, 39.3% reported trouble sleeping, and 33% reported headaches. When participants were asked about specific symptoms of anxiety over the past four weeks, the results were dramatic: 47.2% reported getting easily agitated, 43.8% reported feeling fidgety,

41.8% reported difficulties in winding down, 37.5% reported problems relaxing, 35.7% reported tendencies to over-react to situations; 35.4% reported feeling nervous, and 28.2% reported a lack of tolerance for issues. Participants' perceived overall mental health and reported mental health-related problems are presented in Table 3.

TABLE 4
Alcohol Use (N = 316)

	Percentage
Frequency of Alcohol Use	
Once a month or less	33.5
2-4 times a month	20.6
2-3 times a week	5.7
4 or more times a week	2.2
Number of Drinks on Typical Day	
1-2	11.7
3-4	5.1
5-6	1.9
7-9	0.9
10 or more	2.8
Has 6+ Drinks at One Sitting	
Once a month or less	24.7
2-4 times a month	7.6
2-3 times a week	3.2
4 or more times a week	0.3
Is Unable to Stop Drinking	
Once a month or less	6.0
2-4 times a month	0.6
2-3 times a week	0.3
4 or more times a week	0.6
Drinks First Thing in the Morning	
Once a month or less	0.9
2-4 times a month	0.3
2-3 times a week	0.3
Has feelings of Guilt over Drinking	
Once a month or less	4.1
2-4 times a month	0.3
2-3 times a week	0.6
4 or more times a week	0.3
Is Unable to Remember because of Drinking	
Once a month or less	4.7
2-4 times a month	0.9
2-3 times a week	0.3

The majority of study participants indicated they had never received professional treatment for their mental-health related problems: 24.7% of those who experienced current or past loneliness reported receiving no treatment for the problem by a health care professional; 19% reported never having been treated professionally for their current or past depression, 16.1% reported untreated chronic fatigue; 14.9% reported untreated sleep problems, 11.4% reported untreated substance abuse problems, 10.4% reported untreated anxiety disorders, and 10.8% reported no treatment for "other emotional problems."

Over a third (33.5%) of participating drivers reported using alcohol at least monthly; 11.7% reported drinking 1 to 2

drinks on a typical day; and 24.7% reported having 6 or more drinks at one sitting, on a monthly basis. Six percent of the truckers surveyed reported being unable to stop drinking, .9% reported drinking first thing in the morning, 4.1% reported feeling guilty over drinking, and 4.7% reported difficulties remembering events after drinking. Among illicit substances that were consumed by participants, cannabis (3.4%) emerged as the drug of choice, with opioids (2.5%) and cocaine (2.2%) as a close second and third drug of choice. Four percent of the drivers reported that their drug use affected their emotions, 2.8% had a strong urge to use drugs, 1.3% used more drugs than they intended to use, and 2.2% used drugs for their intended effects (Tables 4 and 5 illustrate participants' reported alcohol and substance use).

Over half of the surveyed truckers (57%) reported having a primary source for medical care. Half of the sample (50%) reported that they routinely visited a medical doctor or nurse practitioner for their medical health care needs. We found that 36.1% used a physician's office and 11.1% used the emergency room of a hospital to access care when needed. Those drivers who did not utilize typical sources for medical care explained their reasons as difficulty making appointments due to their irregular driving schedules (23.4%), lack of health insurance (16.1%), not needing a doctor (10.8%), finding the Department of Transportation's physical sufficient (10.1%), not trusting, liking, or believing doctors (5.1%); inability to afford medical care despite health insurance (4.4%), inconvenience or inaccessibility of health care (4.1%), having two or more usual places (3.8%), not knowing where to go (3.5%), language problems (.6%), and unavailability of regular doctor (.3%). Most drivers (84.2%) reported they did not receive sick leave from their employers. Out of those drivers who received treatment for mental health-related

TABLE 5
Other Substance Use

	Percentage
Substances Used in Past 30 Days	
Cannabis	3.4
Opioids	2.5
Cocaine	2.2
Stimulants	1.9
Sedatives	1.8
Chroming/Huffing	0.6
Hallucinogens	0.3
Other	2.2
Outcomes Experienced from Substance Use	
Emotional effects	4.0
Strong urge to use substances	2.8
Experienced desired effects of substance use	2.2
Used more substances than intended	1.3

TABLE 6
Health/Illness Treatment History (*N* = 316)

	Percentage
Primary Source for Medical Care	
Yes	51.3
No	40.2
More than one place	5.7
Reason for Having no Source of Medical Care	
Difficulty making appointment/irregular schedule	23.4
No health insurance	16.1
Do not need a doctor	10.8
DOT* physical considered sufficient	10.1
Do not trust/like/believe in doctors	5.1
Have insurance but cannot afford office visits	4.4
Have two or more usual places for medical care	3.8
Do not know where to go	3.5
Language problems	0.6
Regular doctor unavailable	0.3
Location where Medical Care is Received	
Physician's office	36.1
Hospital emergency room	11.1
VA hospital	6.3
Urgent care center	3.2
Private outpatient clinic	2.8
Professional Treatment Received in Past Year for Any Type of Distress	
No	90.5
Yes	6.3
Do not know	0.6
Type of Health Professional Visited for Feelings of Distress	
Medical doctor/nurse practitioner	50.0
Religious advisor	4.1
Psychiatrist	3.5
Counselor	2.2
Psychologist	1.9
Therapist	0.9
Do not know	34.2
Received Prescription for Past Year for Feelings of Distress	
No	90.3
Yes	8.4
Do not know	1.3

*DOT = Department of Transportation

problems in the past year, only 8.4% reported receiving prescription medication for mental health-related problems, and 7.8% of those were treated with antidepressant medications. Drivers' health treatment histories are presented in Table 6.

No statistically significant correlations were found between demographic variables (e.g., age, race, marital status, number of children, education) and mental health-related outcomes (depression, anxiety, substance misuse, emotional problems, loneliness, and trouble sleeping), and no statistically significant correlations were found between trucking work environment variables (days per trip, driving schedule, years driving, salary type) and drivers' mental health-related problems.

DISCUSSION AND CONCLUSIONS

Study findings demonstrate that while mental health-related problems such as loneliness, depression, anxiety, sleep problems, and substance use are significant for drivers, they often remain untreated. Left untreated, these mental health-related problems can potentially lead to an increase in risk-taking behaviors, including unprotected sex with multiple partners or with sex workers, or substance misuse, which in turn can lead to highway accidents—all of which can have potential ramifications for public health. This highly underserved population of truck drivers and their mental health-related problems should best be viewed within an occupational environment framework, which goes beyond individual factors such as biology, psychology, and individual lifestyle choice and examines the issues at a broader level.

Depressive symptoms were a significant finding in our study; depression was reported by 26.9% of the participating truckers, which is significantly higher than the 4.8% one-year incidence rate of men with depression in the general US population (Substance Use and Mental Health Services Administration, 2011). Depression has been associated with lower levels of education, low social support, high occupational stressors and job strain, financial strain, and sleep problems in non-trucking samples of working men (Atlantis et al., 2011; Godin et al., 2009; Grav, Hellzén, Romild, & Stordal, 2012; Wang, Schmitz, & Dewa, 2010). These factors are particularly prevalent among long-haul truck drivers, who are often away from friends and family for several days to weeks at a time, who may experience the stressful trucking work environment for lengthy periods of time (Apostolopoulos, & Sönmez, 2010). Since truckers have long work hours and must abide by HOS requirements, sleep problems are common. For example, when truckers reach the maximum number of hours that they can drive in a single day, they are required to pull over and wait the required number of "off" hours, until they are permitted to drive again. Both sleepiness and insomnia are common problems for truckers as a result of the nature of their work. Although significant levels of depression were found among drivers in earlier work, the truckers did not report antidepressant use (Pereira da Silva-Júnior et al., 2009), whereas

a small number of our study participants (7.8%) reported being treated with antidepressant medications.

Our findings of significant symptoms of anxiety experienced by truck drivers support earlier work (Wong, Tam, & Leung, 2007), which reported that 25.9% of truckers surveyed in Hong Kong were more anxious after becoming truck drivers. At the same time, our findings are contrary to those of the Australian Work Outcome Research Cost-Benefit Project (2008), which found lower levels of anxiety among truckers than that found in the general Australian population. In the US, anxiety disorders are the most common classification of mental illness. In fact, 28.8% of the general (male and female) US population has reported experiencing one or more anxiety disorders in their lifetime (Kessler et al., 2005). Found one-year incidence rates for anxiety disorders in the US (male and female) to be 18.1%; anxiety disorders are more common in women than in men (Kessler et al., 2005; Starcevic, 2006). In another study with men, a one-year prevalence rate of anxiety disorders was reported at 8.9% and a lifetime incidence of anxiety disorders reported at 10.4%, both of which are significantly lower than the 14.5% of male truck drivers who reported anxiety disorders in the current study.

Our findings that truckers have a higher than normal BMI is consistent with several other studies of truckers (Caban et al., 2005; Martin, Church, Bonnell, Ben-Joseph, & Borgstadt, 2009; Moreno, Louzada, Teixeira, Borges, & Lorenzi-Filho, 2006; Saltzman & Belzer, 2007; Wood, Hegman, Murtaugh, & Thiese, 2007). Our findings show a negative relationship between BMI and anxiety ($\rho = .169, p < .01$), depression ($\rho = .187, p < .01$), loneliness ($\rho = .174, p < .01$), emotional problems ($\rho = .169, p < .01$), and substance use problems ($\rho = .216, p < .01$). The literature reflects some level of disagreement on the links between high BMI and depression. Our findings support the work of Goldney, Dunn, Air, Dal Grande, and Taylor (2009), which concluded that obese men are less likely to be depressed than men of normal weight, but not that of Bjerkset, Romundstad, Evans, and Gunnell (2008) who found an association between high BMIs and depressive disorders.

Male truckers may overestimate their level of health when asked one broad question, but upon further and specific inquiry, male truckers readily describe mental health-related problems, which are exacerbated by the stressful occupational environment of trucking. Truckers in the current study described their overall mental health as good or excellent, similar to earlier work in which truckers reported their mental health as excellent (42.4%), above average (33.9%), average (18.7%), and poor (1.7%) (Shattell et al., 2010).

The occupational stressors of the trucking work environment enable, impact, and worsen truck drivers' substance misuse (Anderson & Riley, 2008; Apostolopoulos et al., 2010; Apostolopoulos et al., n.d.). Although specific and formal substance-related diagnoses were not obtained from the current study, truckers reported experiences with problematic alcohol and drug use, abuse, and dependence. Survey questions that screened for

problematic alcohol use in the current study were based on the Alcohol Use Disorders Identification Test (AUDIT; Saunders et al., 1993)—a 10-item screening tool developed for health clinicians' use with clients who want to decrease alcohol consumption.

Substance use was determined by asking truckers to report illicit drug use by category of substance (cannabis, stimulants, party drugs [e.g., Ecstasy], opioids, sedatives, hallucinogens, cocaine, chroming or snuffing [e.g., glue, paint, fuel], or other [e.g., steroids, diet pills]) and by frequency (never, once, daily, and weekly) of substance use within the past 30 days. Our findings support those of self-reported usage rates found earlier (Davey, Richards, & Freeman, 2007). Based on results of the 2010 National Survey on Drug Use and Health, 11.2% of males over the age of 12 reported using illicit drugs (Substance Abuse and Mental Health Services Administration, 2011). Amphetamine use among US workers, based on positive drug tests, rose from .34% in 2002 to .48% in 2005 (Quest Diagnostics, 2007). No such reported amphetamine use was found among truckers in this study, with only 14.9% of surveyed truck drivers reporting illicit drug use; however, in earlier research on truck drivers, 88.1% of interviewed drivers reported illicit drug use (Shattell et al., 2010). These discrepancies may be partially explained by the study setting and sample size. Earlier work with truck drivers was conducted primarily in inner city, urban truckstops in Atlanta, Georgia, with a smaller sample of truckers through a series of in-depth interviews (Apostolopoulos & Sonmez, 2010). Data from the current study were collected at a rural truckstop with a much larger sample size, using a self-administered questionnaire. Illicit drug use, in general, is likely to be limited in this population of truck drivers due to random drug screenings by employers. There is insufficient evidence to suggest that the trucking environment might encourage drug use among drivers, however, substance use appears to be a coping mechanism for drivers (Davey, Richards, & Freeman, 2007). There is enough evidence to suggest that the problematic use of substances and alcohol by truckers increases highway crashes and resulting injuries and fatalities (del Rio, Gomez, Sancho, & Alvarez, 2002; Drummer, Gerostamoulos, Batziris, Chu, Capelhorn, Robertson, & Swann, 2004), leads to high-risk sexual behaviors (Apostolopoulos, Sonmez, 2010; Apostolopoulos, Sonmez, Shattell, & Kronenfeld, in press), and may be linked to HIV/STI risks (Lichtenstein, Hook, Grimley, St. Lawrence, & Bachmann, 2008).

Findings from our study indicate that more truckers have greater difficulty accessing health care than what previous studies have shown (Solomon, Doucette, Garland, & McGinn, 2004). Over half of the sample of truckers in one study (Solomon et al., 2004) reported using a physician's office while 17% reported going to urgent care centers or hospital emergency rooms. In our study, however, slightly over one-third of truckers reported using a physician's office, even fewer using emergency rooms for medical care, 12.3% did not receive care because they were on the road, and 9.2% did not know where to stop and find

care when they needed it. In general, truckers are faced with difficulties in receiving medical care when they need it, because they are either on the road or unable to find convenient medical facilities (Layne, Rogers, & Randolph, 2009; Solomon et al., 2004).

Our study sample was limited to male truckers driving through the southeastern US, who were primarily long-haul truckers. Therefore, our findings cannot be generalized to short-haul or local drivers or to female drivers. Another limitation of our study is that it used a cross-sectional design with only quantitative methods. More prospective studies are recommended with more diverse samples of truck drivers (male and female, those who drive alone vs. with companions) in order to better delineate influences on truck drivers' mental health. Mental health-related problems of long-haul truckers have implications for mental health nurses, physicians, and other health care providers; public health educators; truckers and their employers; law enforcement personnel; health and transportation policy makers; and the general public who use highways, roadways, rest areas, truckstops and travel plazas. Interventions to target mental health-related problems of truck drivers need to be tailored to the unique needs of this occupational segment. The occupational health of truckers requires greater research attention. Stressors in truckers' occupational work environments, that limit their locus of control and impact their overall health and safety, requires continued research effort, which can lead to a better understanding of men's health in other underserved working class populations or men's mental health in general.

Study findings suggest that male truck drivers face issues that impact their psychological well-being and lead to symptoms of depression and anxiety in particular; however few truckers have been prescribed any psychotropic medications. In the general US population, men receive antidepressant medications less often than women (Barbui & Percudani, 2006). Truckers are away from home for days or weeks at a time, and tend to visit health care providers only sporadically. Online support for truckers and telehealth assessment and treatment efforts by advanced practice nurses have the potential to help close the gap in health care access that is common for long-haul truckers.

Declaration of interest: The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

REFERENCES

- Anderson, D. G., & Riley, P. (2008). Determining standards of care for substance abuse and alcohol use in long-haul truck drivers. *Nursing Clinics of North America*, 43(3), 357–365.
- Apostolopoulos, Y., & Sönmez, S. (2004). Truckers and Community Health Project—Long-haul trucker interview guide. Unpublished manuscript, Mobility and Population Health Unit, Emory University School of Medicine, Atlanta, Georgia.
- Apostolopoulos, Y., & Sönmez, S. (2010). Healthy Trucker Survey: Assessing truck drivers' health and access to health care (v.1). Unpublished manuscript, University of North Carolina, Greensboro, North Carolina.
- Apostolopoulos, Y., Sonmez, S., Shattell, M., & Kronenfeld, J. (in press). Sex work in trucking mileux: 'lot lizards', truckers, and risk. *Nursing Forum*.
- Apostolopoulos, Y., Sönmez, S., Shattell, M., & Belzer, M. (2010). Worksite-induced morbidities among truck drivers in the United States. *American Association of Occupational Health Nurses*, 58(7), 285–296.
- Apostolopoulos, Y., Sonmez, S., & Massengale, K. (under review, *AIDS Care*). Sexual mixing, drug exchanges, and disease risk among truckers in North America.
- Atlantis, E., Lange, K., Goldney, R., Martin, S., Haren, M., Taylor, A., & . . . Wittert, G. (2011). Specific medical conditions associated with clinically significant depressive symptoms in men. *Social Psychiatry & Psychiatric Epidemiology*, 46(12), 1303–1312. doi:10.1007/s00127-010-0302-3
- Barbui, C., & Percudani, M. (2006). Epidemiological impact of antidepressant and antipsychotic drugs on the general population. *Current Opinion in Psychiatry*, 19(4), 405–410.
- Bjerkeset, O., Romundstad, P., Evans, J., & Gunnell, D. (2008). Association of adult body mass index and height with anxiety, depression, and suicide in the general population: The HUNT study. *American Journal of Epidemiology*, 167(2), 193–202.
- Bureau of Labor Statistics. (2009a). *Occupational employment statistics*. Retrieved from http://www.bls.gov/oes/current/oes_nat.htm#top
- Bureau of Labor Statistics. (2009b). *Current population survey*. Washington, DC: U.S. Department of Labor.
- Bureau of Labor Statistics. (2010–2011). *Occupational outlook handbook. Truck drivers and driver/sales workers*. Washington, DC: U.S. Department of Labor. Retrieved from <http://www.bls.gov/oco/ocos246.htm>
- Caban, A. J., Lee, D. J., Fleming, L. E., Gomez-Marín, O., LeBlanc, W., & Pitman, T. (2005). Obesity in US workers: The National Health Interview Survey, 1986 to 2002. *American Journal of Public Health*, 95, 1614–1622.
- Davey, J., Richards, N., & Freeman, J. (2007). Fatigue and beyond: Patterns of and motivations for illicit drug use among long-haul truck drivers. *Traffic Injury Prevention*, 8, 253–259.
- De Croon, E. M., Sluiter, J. K., Blonk, R. W. B., Broersen, J. P. J., & Frings-Dresen, M. H. W. (2004). Stressful work, psychological job strain, and turnover: A 2-year prospective cohort study of truck drivers. *Journal of Applied Psychology*, 89(3), 442–454.
- del Rio, M. C., Gomez, J., Sancho, M., & Alvarez, F. J. (2002). Alcohol, illicit drugs and medicinal drugs in fatally injured drivers in Spain between 1991 and 2000. *Forensic Science International*, 127(1/2), 63–70.
- Dragano, N., He, Y., Moebus, S., Jöckel, K. H., Erbel, R., & Siegrist, J. for the Heinz Nixdorf Recall Study. (2008). Two models of job stress and depressive symptoms: Results from a population-based study. *Social Psychiatry and Psychiatric Epidemiology*, 43, 72–78.
- Drummer, O. H., Gerostamoulos, J., Batziris, H., Chu, M., & Capelhorn, J., Robertson, M. D., & Swann, P. (2004). The involvement of drugs in drivers of motor vehicles killed in Australian road cases. *Accident Analysis and Prevention*, 36(2), 239–248.
- Ekkekakis, P., Hall, E. E., VanLanduyt, L. M., & Petruzzello, S. J. (2000). Walking in (affective) circles: Can short walks enhance affect? *Journal of Behavioral Medicine*, 23(3), 245–275.
- Godin, I., Kornitzer, M., Clumeck, N., Linkowski, P., Valente, F., & Kittel, F. (2009). Gender specificity in the prediction of clinically diagnosed depression. *Social Psychiatry & Psychiatric Epidemiology*, 44(7), 592–600.
- Goldney, R., Dunn, K., Air, T., Dal Grande, E., & Taylor, A. (2009). Relationships between body mass index, mental health, and suicidal ideation: population perspective using two methods. *Australian & New Zealand Journal of Psychiatry*, 43(7), 652–658. doi:10.1080/00048670902970825
- Grav, S., Hellzèn, O., Romild, U., & Stordal, E. (2012). Association between social support and depression in the general population: The HUNT study, a cross-sectional survey. *Journal of Clinical Nursing*, 21(1/2), 111–120. doi:10.1111/j.1365-2702.2011.03868.x
- Heaton, K. (2005). Truck drivers hours of service regulations: The collision of policy and public health. *Policy, Politics, & Nursing Practice*, 6, 277–284. doi:10.1177/1527154405282841

- Heaton, K., & Anderson, D. (2007). A psychometric analysis of Epworth Sleepiness Scale. *Journal of Nursing Measurement, 15*(3), 177–188.
- Kessler, R. C., Chiu, W. T., Demler, O., Merikangas, K. R., & Walters, E. E. (2005). Prevalence, severity, and comorbidity of twelve-month DSM-IV disorders in the National Comorbidity Survey Replication (NCS-R). *Archives of General Psychiatry, 62*(6), 617–627. Retrieved from www.hcp.med.harvard.edu/ncs/ftpdir/NCS-R_12-month_Prevalence_Estimates.pdf
- Layne, D. M., Rogers, B., & Randolph, S. A. (2009). Health and gender comparisons in the long-haul trucking industry. *American Association of Occupational Health Nurses, 57*(10), 405–413.
- Lichtenstein, B., Hook, E. W., Grimley, D. M., St. Lawrence, J. S., & Bachmann, L. H. (2008). HIV risk among long-haul truckers in the USA. *Culture, Health, & Sexuality, 10*(1), 43–56.
- Martin, B., Church, T., Bonnell, R., Ben-Joseph, R., & Borgstadt, T. (2009). The impact of overweight and obesity on the direct medical costs of truck drivers. *Journal of Occupational & Environmental Medicine, 51*(2), 180–184.
- Maxwell, J. C., & Rutkowski, B. A. (2008). The prevalence of methamphetamine and amphetamine abuse in North America: A review of the indicators, 1992–2007. *Drug and Alcohol Review, 27*, 229–235.
- Moreno, C. R., Louzada, F. M., Teixeira, L. R., Borges, F., & Lorenzi-Filho, G. (2006). Short sleep is associated with obesity among truck drivers. *Chronobiology International, 23*(6), 1295–1303.
- Nunes de Pinho, R. S., Pereira da Silva-Júnior, F., Bastos, J. P. C., Maia, W. S., Túlio de Mello, M., Sales de Bruin, V. M., & Carvalhedo de Bruin, P. F. (2006). Hypersomnolence and accidents in truck drivers: A cross-sectional study. *Chronobiology International: The Journal of Biological and Medical Rhythm Research, 23*(5), 963–971.
- Pereira da Silva-Júnior, F., Nunes de Pinho, R. S., Túlio de Mello, M., Sales de Bruin, V. M., & Carvalhedo de Bruin, P. F. C. (2009). Risk factors for depression in truck drivers. *Social Psychiatry and Psychiatric Epidemiology, 44*, 125–129.
- Quest Diagnostics. (2007). Amphetamines use declined significantly among US workers in 2005, according to Quest Diagnostics' drug testing. Retrieved from http://www.questdiagnostics.com/employersolutions/2007_03/dti.pdf
- Quinlan M. (2010, November 8–10). Organizational influences of truck-driver health: Reviewing the evidence. International Conference on Commercial Driver Health and Wellness, Transportation Research Board and Federal Motor Carrier Safety Administration, Baltimore, MD.
- Sabbagh-Ehrlich, S., Friedman, L., & Richter, E. D. (2005). Working conditions and fatigue in professional truck drivers at Israeli ports. *Injury Prevention, 11*, 11–14.
- Saltzman, G. M., & Belzer, M. H. (2007). Truck driver occupational safety and health: 2003 Conference report and selective literature review (DHHS [NIOSH] publication 2007-120). Retrieved from Department of Health and Human Services, National Institute for Occupational Safety and Health: <http://www.cdc.gov/niosh/docs/2007-120/pdfs/2007-120.pdf>
- Saunders, J. B., Aasland, O. G., Babor, T. F., De La Fuente, J. R., & Grant, M. (1993). Development of the Alcohol Use Disorders Identification Test (AUDIT): WHO Collaborative Project on Early Detection of Persons with Harmful Alcohol Consumption-II. *Addiction, 88*(6), 791–804.
- Shattell, M. M., Apostolopoulos, Y., Sönmez, S., & Griffin, M. (2010). Occupational stressors and the mental health of truckers. *Issues in Mental Health Nursing, 31*, 561–568.
- Silva, O. A., Greve, J. M. D., Yonamine, M., & Leyton, V. (2003). Drug use by truck drivers in Brazil. *Drugs: Education, Prevention, and Policy, 10* (2), 135–139.
- Solomon, A. J., Doucette, J. T., Garland, E., & McGinn, T. (2004). Healthcare and the long haul: Long distance truck drivers—a medically underserved population. *American Journal of Industrial Medicine, 46*(5), 463–471.
- Starcevic, V. (2006). Review: Worldwide lifetime prevalence of anxiety disorders is 16.6%, with considerable heterogeneity between studies. *Evidence Based Mental Health, 9*(4), 115.
- Stratford, D., Ellerbrock, T. V., & Chamblee, S. (2007). Social organization of sexual-economic networks and the persistence of HIV in rural area in the USA. *Culture, Health & Sexuality, 9*(2), 121–135.
- Substance Abuse and Mental Health Services Administration. (2011). Results from the 2010 National Survey on Drug Use and Health: Summary of national findings NSDUH Series H-41, HHS Publication No. (SMA) 11-4658. Rockville, MD: Author.
- U.S. Department of Transportation, Federal Motor Carrier Safety Administration of 1999. (2010). 49 U.S.C. § 395. Hours of service regulations. Retrieved from <http://www.fmcsa.dot.gov/rules-regulations/topics/hos/index.htm>
- Wang, J., Schmitz, N., & Dewa, C. (2010). Socioeconomic status and the risk of major depression: The Canadian National Population Health Survey. *Journal of Epidemiology & Community Health, 64*(5), 447–452.
- Wong, W. C. W., Tam, S. M., & Leung, P. W. S. (2007). Cross-border truck drivers in Hong Kong: Their psychological health, sexual dysfunctions and sexual risk behaviors. *Journal of Travel Medicine, 14*, 20–30.
- Wood, E. M., Hegman, K. T., Murtaugh, M., & Thiese, M. S. (2007). Lifestyle risk factors in commercial drivers. University of Utah, Rocky Mountain Center for Occupational and Environmental Health (research presentation).
- Work Outcome Research Cost-Benefit (WORC) Project—Valuing Healthy Employees (2001). Health Appraisal Survey. Brisbane, Australia, University of Queensland.
- Work Outcome Research Cost-Benefit (WORC) Project (2008). Health Survey of the NSW Transport Industry. Wacol, Australia, Australian Rotary Health Research Fund.