



## Original Article

## Effect of Co-Driver on Job Content and Depression of Truck Drivers

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## ABSTRACT

**Background:** Since the presence of a co-driver can be considered as a companion, partner, or friend for a driver through eliminating driver's loneliness, it plays a significant role in health and safety of drivers. The objective of this study was to investigate the effect of co-drivers on depression and occupational stress on male truck drivers.

**Methods:** This study was an interventional case-control study. Seventy truck drivers were selected and divided into two groups: case (33 truck drivers with co-drivers) and control (37 truck drivers without co-drivers). Two Goldberg depression inventories (for evaluating driver's depression) and the Karasek job content questionnaire (for evaluating driver's job stress) were used to collect data which were completed by interview.

**Results:** The results showed that job content values for the case group were higher in all dimensions except job nature. The comparison of the percentages showed significant difference between two groups. Depression rate in drivers with co-driver is truly less than depression rate in drivers without co-driver. There was significant positive relationship between dimensions of job content and depression rate.

**Conclusion:** According to the results of this study, it can be claimed that a co-driver decreases stress and loneliness of drivers, as well as increases work performance and job satisfaction, and, in turn, leads to a decrease in job-related depression.

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## 1. Introduction

One of the most important occupations of our population is truck driving. According to the statistics of Bureau of Labor Statistics, about 1,701,500 individuals were working as a truck driver in 2012 [1]. According to the statistics of the Iran Ministry of Roads & Urban Development, about 25800 trucking trip have been accomplished on Iran road in 2015 [2]. Truck drivers are frequently exposed to a lot of factors causing stress such as job difficulty, long and exhausting driving distances, fatigue, irregular rest and sleep schedule, nonstop working hours, and traffic chaos. The drivers are alone and have no colleagues while working on trucking trips, and they are far from home since they take on distant trips. Thus, we should consider truck driving as one of the vulnerable occupations in our community [3–5]. They are exposed to mentioned stressors and show symptoms of depression caused by these factors [6,7]. In recent years, increasing investigations on “stress in work environments including truck driving” have led to best understanding of

working stress and depression [8,9]. Since stress can cause depression, mental health improvement in workplace requires identifications of stressors and prevalence rate of mental disorders [10]. The population of truck drivers is unavailable for research because they do not work in the same place like office, and they are far away from home and distributed all over the country. As a result, a limited number of scientific researches have been done on truck drivers [11]. The results of the study by da Silva-Júnior et al showed that the prevalence of depression among truck drivers was 13.6%. The low educational level, use of stimulants, and wage-earning increased the risk for depression [6]. In the study by Vakili, the prevalence of depression among truck drivers was found to be 15.8%, and the rate of depression among drivers who had longer trips and slept less was significantly higher [12]. Sleep disorder is common among intercity bus driver as the studies by De Pinho and Mello indicated that, respectively, 46 and 60% of truck drivers and bus drivers in Brazil had a disorder of sleep [13,14]. Also, in the study conducted by Hornyak, the relationship between insomnia

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**Table 1**  
The demographic data of studied population

Studied population	Number	Demographic data	Minimum	Maximum	Mean	SD	p value*
Drivers	70	Age (yr)	25	65	39.86	8.82	0.34
		Work experience (yr)	5	40	13.77	8.33	0.11
Co-drivers	33	Age (yr)	18	32	23.97	3.28	—
		Work experience (yr)	1	7	2.15	1.22	—

SD, standard deviation.

\*p value of driver age and driver work experience shows that these variations are matched in two groups.

and depression was confirmed [15]. And, different studies have stated that the relationship between depression and bitter events in life is significant, and it has been considered as psychosocial consequences stemming from car accidents [16,17]. Most of these researches have focused on prevalence of depression and work hardness in truck drivers. Also, limited studies have evaluated the decreasing effect of various factors on depression and occupational stress in truck drivers [18–20].

Co-driver is an important factor which can have a positive effect on truck driver. Co-driver through elimination of driver loneliness and as a companion, partner, or friend for driver can play a significant role in health and safety of the drivers. To our best knowledge, unfortunately, there is no study in this area. Therefore, the reduction of depression and occupational stress are of great importance; moreover, investigation into this field is insufficient. Thus, the novelty of this work is the investigation of some factors effecting depression of drivers. The objective of this study was to investigate the co-driver effect on depression and occupational stress on male truck drivers.

## 2. Material and methods

### 2.1. Study population

This research was a case-control study accomplished to investigate the co-driver effect on depression and occupational stress of truck drivers in northwest of Iran in 2017. Seventy truck drivers, who were divided in two groups: case (33 truck drivers with co-drivers) and control (37 truck drivers without co-drivers), were evaluated. The sample size was calculated based on the information of the study by Chen [21] and the following statistical formula:

$$n = \frac{2(Z_1 - \frac{\alpha}{2} + Z_1 - \beta)^2 \times p(1 - p)}{(p_0 - p_1)^2}$$

The criteria for entering to the study were as follows: five years of work experience, being insured, lack of addiction, no alcohol intake, healthy drivers and co-drivers, and trucks are used for less than 10 years. It should be pointed out that lack of addiction to drugs, no alcohol intake, and being healthy of the drivers were investigated through the health cards, which are issued from the centers for occupational medicine, of them; these cards show that drivers are healthy and they do not have an addiction.

Truck drivers and co-drivers have been evaluated without mentioning personal details and with approval and awareness about the study information and how will it be done. The consent form was given to all drivers and co-drivers and then verified by the research committee of Iran University of Medical Sciences.

### 2.2. Data collecting instrument

Two Goldberg depression inventory (for evaluating driver depression) and the Karasek job content questionnaire (for evaluating driver's job stress) were used to collect data and were completed by interview.

Goldberg depression inventory is an 18 item Likert scale questionnaire, with a score of 0–90. Rating of this questionnaire is 0–9 (depression unlikely), 10–17 (possibly minor depression), 18–21 (on the verge of depression), 22–35 (minor to moderate depression), 36–53 (moderate to severe depression),  $\geq 54$  (severe depression). Reliability and validity of this questionnaire was examined by Cronbach  $\alpha$  scale and factorial analysis. Total reliability was obtained with Cronbach  $\alpha$  for three groups of people; with high school diploma, higher education, and other people of the population were, respectively, 0.901, 0.861, and 0.817. The results of the factorial analysis showed that this scale consists of three main factors that explain 44.63% of the total variance of depression. Regarding to the high reliability, Goldberg depression inventory is a good screening method for identifying depressed people [22].

Dimension of job stress was evaluated by the Karasek job content questionnaire. This questionnaire is a self-evaluating instrument for measuring psychosocial characteristics of the job. One of the important characteristics of this questionnaire is collecting completely objective data in workplace for improvement of psychosocial condition of the job. This questionnaire focuses on issues related to job demands, job nature, latitude of decision making, and social conflict. There are different versions of this questionnaire, which has been used in this study; it was translated to the Persian standardized version designed by doctor Karasek from California Massachusetts University. Response range varied from 1 (never) to 4 (severe). The factors that evaluated in this questionnaire are as follows: (1) job demands (related questions: work load, working speed, accumulation of unfinished works, and lack of colleague), (2) job nature (related questions: concentration on working, the level of being challenging of work, equipment failure, and work interruption due to lack of equipment), (3) latitude of decision-making (related questions: latitude in working speed determining, latitude in determining the sequence of work, and possibility of short rest while working), and (4) social conflict (related questions: mistreatment of the people who were in contact with them, support of employer, support of colleagues, and contact with nervous people). The higher score in questions means that the person deals with stressful job content. The reliability of this questionnaire with Cronbach  $\alpha$  mean in all dimensions of job content is 0.750 [23–25]. It should be mentioned that truck drivers in Iran are mostly self-employed, and they are not hired by any organization or company; thus, they do not have an employer. Hence, question number nine that deals with the supports of employer was eliminated from the questionnaire.

### 2.3. Data collecting procedure

To have homogeneous drivers and co-drivers selected for the current research, drivers and co-drivers in queue passing Bazargan border crossing, in the north-western of Iran were studied. The researcher started his assignment to find the drivers with a co-driver having eligible qualifications and satisfaction to contribute to our study; in this case, both the drivers and co-drivers filled out together the questionnaire in trucks' cabins.

**Table 2**  
The comparison of job content scales between drivers with and without co-drivers

Job content scales	Score	Drivers		p value	Total
		With co-driver (%)	Without co-driver (%)		
Decision latitude	<6	48.5	18.9	0.009	32.9
	6–12	51.5	81.1		
Job demand	<12	69.7	21.6	<0.001	44.3
	12–20	30.3	78.4		
Social conflict	<6	60.6	35.1	0.033	47.1
	6–12	39.4	64.9		
Job nature	<8	21.2	16.2	0.760	18.6
	8–16	78.8	83.8		

2.4. Analysis method

SPSS, version 22, was used for analyzing the data. Independent sample *t* test, Chi-square, and Fisher test were utilized for analysis of the obtained data. The significance level in this research was 0.05.

3. Results

The demographic data of the drivers and co-drivers, surveyed in this study, have been shown in Table 1, which includes age and work experience. There was no significant difference between the two case and control groups in drivers' work experience and driver age (*p* value >0.05).

Table 2 shows percentages of job content in four job dimensions between the two case and control groups. Comparison of percentages shows significant difference between two groups in decision latitude, job demand, and social conflict (*p* value <0.05). There was no significant difference in job nature (*p* value >0.05).

Fig. 1 shows depression rates. Depression rates in drivers with co-driver are truly less than those in drivers without co-drivers. It should be noted that this difference between two groups was statistically significant.

The results of the analysis on relationship between dimensions of job content and depression rate are presented in Table 3; there was a significant positive relationship between depression and job content in all dimensions (*p* value <0.05).

4. Discussion

The aim of this study was to investigate the effect of a co-driver on job stress and depression of truck drivers. Our results showed that truck drivers with co-drivers had less depression and less job stress than the truck drivers without co-driver; also it was observed that there is a significant increase in depression with increasing job stress.

The results of related studies have illustrated that high job stress causes depression [26], and the theory presented in the study by Karasek and Theorell [27] confirms this. Long-term stress exposure is a strong cause for depressive symptoms [28]. Severe cases of burnout can cause depression [29]. In this study, the drivers without a co-driver were more exposed to stress, burnout, and depression because there was no share of responsibility between drivers and co-drivers, and the driver had to handle all the exhausting tasks alone. Biologically, a lot of factors can cause depression, but the major cause of depression is abnormality of stress adaptation system in brain [30]. In some cases, job stress can be harmful to neurological systems [31] that can lead to depression. The results of the current study also showed that, with increasing job stress, depression increases significantly.

It was found that the drivers without a co-driver had significantly more depression rate than the drivers with a co-driver. A co-driver can eliminate the loneliness of a driver and he can be as a companion, partner, or friend alongside the driver. The literature review revealed that loneliness causes depression, and intimate communications with friends can reduce depression [32–34]. Sullivan describes loneliness as “Loneliness is an unpleasant experience caused by inadequate intimate communication with other people,” this communication is one of the human needs, and its lack can cause isolation and depression [35]. Another study claimed that loneliness can cause adverse effects on life satisfaction [36]. Loneliness, anger, sleeplessness, performance decrease, quitting from work, and job dissatisfaction finally can lead to depression [37,38]. Accordingly, since the presence of a co-driver can eliminate the loneliness of the driver, he can be considered as a speaking partner and even intimate friend; thus, a co-driver can decrease the depression of drivers. One of the advantages of social relationships is social support that increases mental health [39].

Job stress was evaluated in four dimensions of job content in truck drivers. In decision latitude, job demand, and social conflict, truck drivers with a co-driver show significantly less stress than truck driver without a co-driver. In dimension of job nature, the difference was not significant, but drivers with a co-driver showed less job stress. Because driving and other tasks are shared between drivers and co-drivers, as a result, there is no time limit for cargo delivery and no need for quick work; therefore, the priority of doing works was arbitrary (latitude in working speed determining, latitude in determining the sequence of work). A driver can have rest time with sharing tasks and work participation with a co-driver (possibility of short rest while working). Decision latitude has a positive impact on the well-being and health of employees [40]. The participation of co-workers at work increases free time and, in turn, they can use this time for setting goals to do their duties. Participation at work using a work design strategy and setting goals can be considered as factors determining the speed and sequence of

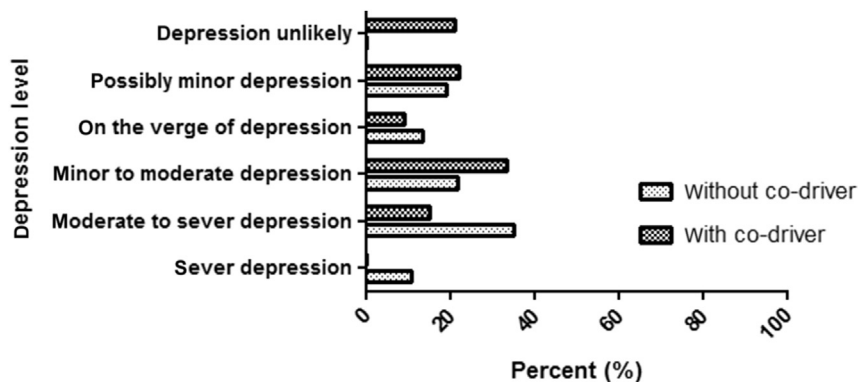


Fig. 1. Depression rate between two groups.

**Table 3**  
The relationship between job content scales and depression in drivers with and without co-drivers

Depression rate	Job demand		Job nature		Decision latitude		Social conflict	
	Low stress%	High stress%	Low stress%	High stress%	Low stress%	High stress%	Low stress%	High stress%
Depression unlikely	22.6	0.0	15.4	8.8	26.1	2.1	18.2	2.7
Possibly minor depression	22.6	17.9	15.4	21.1	21.7	19.1	24.2	16.2
On the verge of depression	12.9	10.3	23.1	8.8	17.4	8.5	15.2	8.1
Minor to moderate depression	29.0	25.6	46.2	22.8	30.4	25.5	27.3	27.0
Moderate to severe depression	12.9	35.9	0.0	31.6	0.0	38.3	15.2	35.1
Severe depression	0.0	10.3	0.0	7.0	4.3	6.4	0.0	10.8
Significance (p value)	0.004		0.042		<0.001		0.037	

doing the job that cause decision latitude [41]. Therefore, this job content dimension is less stressful with a co-driver.

Participation with colleagues in work increases motivation for work, job satisfaction, and performance improvement [41,42]. Co-worker support can reduce employee's stress [43]. As a result, job demand–related stress is reduced by assistant, support, and participation of co-driver.

Support of colleagues, employer, and friends can reduce job stress and increase job satisfaction in workers [44]. Lack of job support leads to anger and depression and reduces job satisfaction [45]. Conflict with people is a powerful stressor [46]. Social support is considered as a stress regulator [47]. Contact with different people along driving path is divided between driver and co-driver and also co-driver can play a supportive role during conflict with people, therefore social conflict–related stress was reduced by co-driver.

A co-driver did not have an effective role in job nature because a co-driver cannot change the nature of the job. For example, he cannot prevent equipment failure because it depends on other factors like production quality. Nevertheless, there was little difference in challengeability of work between the two groups. For instance, tasks like wheel puncture treatment and tighten snow chain on wheels are challenging tasks for a driver but a co-driver can help in this issues and reduce stress.

The findings illustrated that the presence of a co-driver can cause a decrease in job stress and accordingly driver loneliness and consequently increases work performance and job satisfaction which lead to less job-related depression. In recent years, using driver intelligent assistant systems instead of human co-driver has been developed. These systems may be able to increase safety and reduce accidents, but, considering human emotions and long driving directions for several days, driver intelligent assistant systems cannot be considered as a good alternative to human co-drivers. Therefore, it is better to use both of them simultaneously.

### Conflicts of interest

The authors declare that there is no conflict of interest regarding the publication of this article.

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