




RESEARCH ARTICLE

REVISED Presenteeism and associated factors among railway train drivers [version 2; peer review: 2 approved]

Asmaa El-Sayed Awaad ¹, Sohair El-Bestar², Abdel-Hady El-Gilany³, Adel Al-Wehedy², Samah Saleh El-Hadidy⁴

¹Assistant lecturer of Industrial Medicine and Occupational Health, Public Health & Community Medicine Department, Faculty of Medicine, Mansoura University, Mansoura, Dakahlia Governorate, 35516, Egypt

²Professor of Industrial Medicine and Occupational Health, Public Health & Community Medicine Department, Faculty of Medicine, Mansoura University, Mansoura, Dakahlia Governorate, 35516, Egypt

³Professor of Public Health and Preventive Medicine, Public Health & Community Medicine Department, Faculty of Medicine, Mansoura University, Mansoura, Dakahlia Governorate, 35516, Egypt

⁴Assistant professor of Industrial Medicine and Occupational Health, Public Health & Community Medicine Department, Faculty of Medicine, Mansoura University, Mansoura, Dakahlia Governorate, 35516, Egypt

v2 First published: 28 Apr 2022, 11:470
<https://doi.org/10.12688/f1000research.111999.1>

Latest published: 01 Jun 2022, 11:470
<https://doi.org/10.12688/f1000research.111999.2>

Abstract

Background: Presenteeism is an emerging work-related health problem among train drivers. It is more serious than absenteeism, as it accounts for higher productivity losses over the long term and may increase the risk of occupational accidents. Train drivers have high rates of mental and physical health conditions that may put them at high risk of presenteeism.

Methods: A comparative cross-sectional study was conducted on 100 train drivers working in Mansoura railway station and 100 administrative employees working in the Faculty of Medicine, Mansoura university as a comparison group to estimate the prevalence of presenteeism and its associated factors among train drivers working in Mansoura railway station, Egypt. A questionnaire was used to collect socio-demographic, occupational and medical data. The Kessler Psychological Distress Scale (K10) was used to measure non-specific psychological distress. The Stanford Presenteeism Scale (SPS-6) was used to assess productivity loss related to sickness presenteeism.


Results: The prevalence of presenteeism was significantly higher among train drivers (76%) compared to the comparison group (31%). All participants (100%) with psychological distress reported presenteeism. Being a train driver (adjusted odds ratio [AOR]=5.4) and having hypertension (AOR=4.03) are independent predictors for presenteeism.

Conclusions: The prevalence of presenteeism and its associated risk factors were significantly higher among train drivers than the comparison group. There is an urgent need for the railway industry to understand the factors that may contribute to presenteeism.

Open Peer Review

Approval Status 

	1	2
version 2		
(revision)		
01 Jun 2022		
version 1		
28 Apr 2022		

1. **Alisha McGregor** , University of Wollongong, Wollongong, Australia

2. **Amal ElSafty** , Cairo University, Giza, Egypt

Any reports and responses or comments on the article can be found at the end of the article.

Keywords

Railway, Egyptian train drivers, Presenteeism, Stanford presenteeism scale-6, Psychological distress

Corresponding author: Asmaa El-Sayed Awaad (asmaa_awaad@mans.edu.eg)

Author roles: **Awaad AES:** Data Curation, Formal Analysis, Investigation, Resources, Software, Validation, Visualization, Writing – Original Draft Preparation, Writing – Review & Editing; **El-Bestar S:** Conceptualization, Methodology, Project Administration, Supervision, Writing – Review & Editing; **El-Gilany AH:** Conceptualization, Formal Analysis, Methodology, Project Administration, Writing – Review & Editing; **Al-Wehedy A:** Methodology, Project Administration, Writing – Review & Editing; **El-Hadidy SS:** Methodology, Project Administration, Validation, Visualization, Writing – Review & Editing

Competing interests: No competing interests were disclosed.

Grant information: The author(s) declared that no grants were involved in supporting this work.

Copyright: © 2022 Awaad AES *et al.* This is an open access article distributed under the terms of the [Creative Commons Attribution License](#), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

How to cite this article: Awaad AES, El-Bestar S, El-Gilany AH *et al.* **Presenteeism and associated factors among railway train drivers [version 2; peer review: 2 approved]** F1000Research 2022, 11:470 <https://doi.org/10.12688/f1000research.111999.2>

First published: 28 Apr 2022, 11:470 <https://doi.org/10.12688/f1000research.111999.1>

REVISED Amendments from Version 1

Referring to the comments from Dr Alisha McGregor, in this second version of the manuscript we have made the following changes:

- 1) The term "over the long term" is added to the sentence (presenteeism involves higher productivity losses than absenteeism over the long term) in the "abstract" and the beginning of "introduction".
- 2) The definition of presenteeism in the beginning of "introduction" is modified to be consistent with the way we have measured presenteeism in the study.
- 3) A new paragraph is added at the end of "introduction" about musculoskeletal and neurological pain as predictors of presenteeism with additional new reference.
- 4) In "methods" section, the heading 'flow of work' is replaced by 'study procedure'.

Any further responses from the reviewers can be found at the end of the article

Introduction

Presenteeism is defined as the phenomenon of people, who are physically present at work but experience "decreased productivity and below-normal work quality" due to an illness.¹ Presenteeism can negatively affect productivity in a way similar to absenteeism. However, presenteeism involves higher productivity losses than absenteeism over the long term.² It can decrease work productivity and working safely and may increase the risk of occupational accidents.³ Presenteeism is more costly to employers than absenteeism, since employers pay the employees for their attendance at work and prolonged work time to complete a task. They also pay them for any compensation as a result of errors done by sick employees.⁴

Certain difficulties in work can increase the risk of presenteeism such as; the fear of an employment or losing a job, staff replacement, and financial difficulties.^{1,5} Lack of control over tasks and inadequate support from coworkers are also risk factors associated with higher risk of presenteeism.^{6,7}

Presenteeism has been linked to stress at work.⁸ Stress and subsequently psychological distress are considered to be significant contributors to presenteeism.⁹⁻¹¹

In the railway industry, presenteeism is a common problem among train drivers as they have to deal with a high level of job demands and responsibilities.¹² Train driving is a high-strain job which needs complex skills. A healthy physical and mental condition of train drivers is also very important since, their vigilance and attention are crucial to their job. The work-place environment and its different hazards increase the work load among train drivers.¹³ They are exposed to several psychosocial risk factors such as; working in shifts, lone working and irregular working hours, long hours of duty with rigid protocols and little options for taking rest. These factors are considered a source of stress and mental suffering among train drivers affecting their health, interfering with their attention and concentration and directly influence the prevalence of presenteeism.¹⁴⁻¹⁶

The presence of chronic conditions is also a major risk factor for presenteeism. Chronic conditions can lead to inadequate work performance as a result of poor physical and psychological well-being of workers.^{17,18} Cardiovascular risk factors such as obesity, hypertension and dyslipidemia were the most prevalent health conditions in train drivers and also have the greatest impact on their fitness for duty.¹⁹ Several studies have found that health risks such as obesity, physical inactivity, poor diet, hypertension, hypercholesterolemia and musculoskeletal pain are directly related to productivity loss if the workers continue to work while ill.^{10,20} Furthermore, presenteeism may exacerbate the existing health conditions and impair the quality of life of sick employees.²⁰ Also, pain conditions such as musculoskeletal and neurological pain can lead to productivity loss. "Pain, no matter what the cause, will always translate into decreased productivity at work".²¹ To the best of the authors' knowledge, this work is the first attempt to study the problem of presenteeism and its association with physical and psychological health status among railway train drivers in Egypt.

Aim of work

This study aims to estimate the prevalence of presenteeism and determine its possible associated factors among train drivers working at Mansoura railway station.

Methods

Ethical consideration

This manuscript is abstracted from an MD thesis (not published yet) that was approved by Institutional Research Board (IRB) of Faculty of Medicine, Mansoura University, code number: MD.18.12.108. Approval of all responsible authorities was obtained. Written informed consent was obtained from participants with assurance of confidentiality. The questionnaire was anonymous. A copy from laboratory investigation was given to each participant with suitable advice in case of abnormal findings for further management.

Study locality and duration

The study was conducted on train drivers working at Mansoura railway station located in the Central Delta Region of the Egyptian National Railways (ENR) during the period from February to November 2019.

Study design

Cross-sectional comparative study.

Study population

This study included all train drivers and their assistants working in Mansoura railway station. They were requested personally by the investigator and asked to participate voluntarily in the study. All eligible train drivers and their assistants who accepted to participate in the study and had the following inclusion criteria were recruited; working for at least one year, in both day and night shifts and in both passenger and freight (goods) transport. Train drivers who were away from train driving and shifted to administrative work due to medical or non-medical causes were not included in the study. The total workforce in the group was 100, including; 58 train drivers and 42 train driver assistants. An equal number of 100 participants were chosen from the administrative staff working in the Faculty of Medicine, Mansoura university as a comparison group. Both groups were matched in their socio-demographic characteristics.

Study procedure

Train drivers were interviewed and examined at 8 am in the off days or either before or after shift in a specific room at a nearby hospital (Mogamaa Al-Eyman Hospital), near to Mansoura railway station; while for the comparison group, the study was carried out at Public Health and Community Medicine Department, Faculty of Medicine, Mansoura university, during the work day. The interview and examination of study participants were carried out in the same session personally by the investigator and lasted for 20-30 minutes for each participant, including filling in the questionnaire; clinical examination and withdrawing blood samples for laboratory investigation. The blood samples were collected between 8-9 am in a sitting position after 10-12 hours of fasting to assess lipid profile then the samples were transferred in an icebox to the laboratory of Clinical Pathology Department, Faculty of Medicine where biochemical evaluation was carried out. The research work was carried out 2-3 times weekly, at times suitable to the study participants, with an average of 8-10 participants per setting.

Study tools

Participants in both groups were subjected to:

- 1) A pre-designed questionnaire to collect the following data; sociodemographic characteristics and personal history, occupational history and physical complaints in the last 12 months.⁵³ No preliminary testing was done as sociodemographics, occupational and clinical data have no scoring to create latent variable. Physical complaints were arranged according to international classification of diseases ICD-10, World health Organization version 2016²² and included; ocular, auditory, respiratory, dermatological, musculoskeletal, cardiovascular and neurological complaints. Cardiovascular complaints included; chest pain, chest tightness, shortness of breath and palpitation. Neurological complaints included; difficulty in concentration, tingling and/or numbness in toes or fingers and pain and/or weakness in distal muscles.
- 2) **Kessler Psychological Distress Scale (K10)**: a widely-known measure of non-specific psychological distress based on behavioral, emotional, cognitive, and psychophysiological manifestations.²³ The questionnaire (K10) measures the frequency with which the individual developed anxiety and depression symptoms in the past month. The questionnaire consists of 10 questions, each of which has five possible response choices ranging from “none of the time” to “all of the time” with scores from 1 to 5. The highest score is 50, which indicate severe distress, and the lowest score is 10 indicating no distress. Scores of 11-19 indicates low level of distress, 20–24 indicates mild level of distress, 25–29 moderate level of distress and scores of 30–50 indicates severe or very high psychological distress. Psychological distress is determined with a score higher than 19 (>19).²⁴ Arabic translation of questions was derived from the Arabic version of the ten-item version of Kessler Psychological Distress Scale (K10).²⁵

- 3) **Stanford Presenteeism Scale (SPS-6):** a well-known measure of productivity loss related to sickness presenteeism. It has two parts; in the first part, prevalence of sickness presenteeism is determined using the following question; '*During the last month have you shown up for work despite feeling sick or having a health problem that prevented you from carrying out your tasks in a normal manner?*'.²⁶ If presenteeism is detected in the first part, the second part of the questionnaire should be completed, it consists of six-items with a five-point scale of responses ranging from strongly disagree to strongly agree and scored from 1 to 5 translated in to Arabic. Questions 1, 3 and 4 evaluate the ability of the respondents to concentrate during work performance; while the questions 2, 5 and 6 assess the interference of the reported health problems with the ability to complete work.¹ Scores can range from 6-30, with lower scores (≤ 18) indicting presenteeism (decreased productivity and below-normal work quality due to an illness), and higher scores (> 18) indicating a greater ability to concentrate on and accomplish work despite health problem(s).¹
- 4) **Blood pressure measurement:** a mercury sphygmomanometer (Alpk2 300-V, Japan) was used to measure blood pressure on the right arm supported at heart level in the seated position after five minutes of rest. It was measured twice at five-minute intervals and the average of both readings was used to estimate the individual's blood pressure.²⁷ Hypertension is considered when systolic blood pressure (SBP) ≥ 140 mmHg and/or diastolic blood pressure (DBP) ≥ 90 mmHg; or current use of antihypertensive treatment.²⁸
- 5) **Anthropometric measurements:** body weight was measured in kilograms with a portable mechanical weighing scale (Laica LC02/e-11/2013, China). Height was measured in centimeters. Body mass index: was derived by dividing the weight in kilograms by the square of the height in meters (kg/m^2). According to BMI, the subject is classified as: underweight (BMI < 18.5) normal weight (BMI ≥ 18.5 to < 25), overweight (BMI ≥ 25 to < 30) and obese (BMI ≥ 30).^{29,30}
- 6) **Laboratory investigation:** a 2 ml peripheral blood sample was obtained from the antecubital vein of each participant after 10-12 hours of fasting for biochemical testing (lipid profile). Blood samples were collected in glass tubes and transferred immediately to the laboratory of Clinical Pathology Department, Faculty of Medicine where total cholesterol, low-density lipoprotein (LDL-cholesterol), high-density lipoprotein (HDL-cholesterol), and triglycerides serum levels were measured (Roche copus c111 analyzer, Switzerland). Dyslipidemia was defined as abnormalities in the plasma lipids occurring either singly or in combinations measured in milligrams (mg) per deciliter (dl) of blood and converted in to SI units (mmol/L), including; total cholesterol ≥ 200 mg/dL (≥ 5.18 mmol/L), LDL ≥ 130 mg/dl (≥ 3.36 mmol/L), triglycerides ≥ 150 mg/dl (≥ 1.69 mmol/L) and HDL < 40 mg/dl (< 1.03 mmol/L) and/or using lipid-lowering medications.^{31,32}

Statistical analysis

Data were entered and statistically analyzed using (SPSS version 16.0, RRID:SCR_016479). Qualitative variables were expressed as numbers and percentages. Chi-square test (χ^2) was used for significance testing of categorical data; as appropriate. Crude odds ratios (COR) and their 95% confidence intervals (CI) were calculated. Quantitative data were described as means \pm SD (standard deviation) after testing for normality using Shapiro test and for comparison between groups, independent sample t-test was used. Significant predictors of presenteeism in bivariate analysis were entered into binary stepwise logistic regression for prediction of independent predictors of presenteeism. Adjusted odds ratios (AOR) and their 95% confidence intervals (CI) were calculated. A statistically significant difference was considered at P value ≤ 0.05 .

Results

The number of participants at each stage of the study was 200 (100 train drivers and 100 comparison group) except for the stage of laboratory investigation where the number of participants was 185 (92 train drivers and 93 comparison group) indicating those who accepted to give blood sample for laboratory investigation.⁵²

Table 1 reveals that train drivers matched the comparison group in all sociodemographic characteristics with no statistically significant differences ($P > 0.05$). There is no statistically significant difference ($P > 0.05$) between duration of employment in both groups. However, the mean working hours per week is statistically significantly higher ($P \leq 0.001$) among train drivers (65.52 ± 8.7 hours) compared to the comparison group (35.88 ± 0.8 hours). Most of the train drivers (72%) worked alternating day and night shifts while all the comparison group (100%) worked only day shifts with a highly statistically significant difference ($P \leq 0.001$).

Table 2 shows that the most frequent physical complaints among train drivers during the last 12 months were musculoskeletal complaints (60%), followed by neurological (47%), then cardiovascular complaints (33%). In the

Table 1. Socio-demographic characteristics and occupational profile of the study groups.

Characteristics	Train drivers n=100	Comparison group n=100	Test of significance and P- value
	N (%)	N (%)	
Age in years			
Mean \pm SD	40.8 \pm 8.78	41.5 \pm 8.45	t=0.542, P=0.6
<40	44(44)	43(43)	$\chi^2=0.02$ P=0.9
\geq 40	56(56)	57(57)	
Marital status			
Single	6(6)	8(8)	$\chi^2=0.32$ P=0.6
Married	94(94)	92(92)	
Residence			
Urban	40(40)	35(35)	$\chi^2=0.53$ P=0.5
Rural	60(60)	65(65)	
Education level			
Primary & preparatory	11(11)	8(8)	$\chi^2=1.73$ P=0.4
Secondary (general & technical)	71(71)	67(67)	
Intermediate institute or higher	18(18)	25(25)	
Duration of employment (years)			
Mean \pm SD	17.4 \pm 9.88	16.7 \pm 8.34	t=0.54, P=0.6
Working hours per week			
Mean \pm SD	65.52 \pm 8.7	35.88 \pm 0.8	t=34.02, P \leq 0.001
Type of shift^a			
Day	15(15)	100(100)	$\chi^2=147.8$ P \leq 0.001
Night	13(13)	0	
Alternating day and night	72(72)	0	

^aDay shift (6:00 a.m. to 6:00 p.m.); and night shift (6:00 p.m. to 6:00 a.m.). SD=standard deviation.

Table 2. Distribution of physical complaints of the study groups in the past 12 months.

Physical complaints	Train drivers n=100	Comparison Group n=100	Test of significance and P value
	N (%)	N (%)	
Ocular	30(30)	17(17)	$\chi^2=4.7$ P=0.03
Auditory	13(13)	7(7)	$\chi^2=2.00$ P=0.15
Respiratory	20(2)	2(2)	$\chi^2=16.55$ P \leq 0.001
Cardiovascular	33(33)	12(12)	$\chi^2=11.54$ P=0.001
Musculoskeletal	60(60)	36(36)	$\chi^2=12.66$ P \leq 0.001
Neurological	47(47)	17(17)	$\chi^2=10.67$ P=0.001
Dermatological	12(12)	6(6)	$\chi^2=2.19$ P=0.14

comparison group, the musculoskeletal complaints (36%) ranked the first, followed by ocular (17%) and neurological complaints (17%). Almost all physical complaints were more frequent among train drivers compared to the comparison group with a statistically significant difference (P \leq 0.05) except for auditory and dermatological complaints where the difference was statistically not significant (P>0.05).

Table 3. Morbidity pattern of the study groups.

Morbidity pattern	Train drivers n=100	Comparison group n=100	Test of significance and P value
	N (%)	N (%)	
Obesity	62(62)	12(12)	$\chi^2=53.63$, $P\leq 0.001$
Hypertension ^b	46(46)	16(16)	$\chi^2=21.03$, $P\leq 0.001$
Dyslipidemia ^c	67(72.8)	33(35.5)	$\chi^2=25.97$, $P\leq 0.001$
Psychological distress	71(71)	27(27)	$\chi^2=38.74$, $P\leq 0.001$

^bHypertension cases (46 vs. 16) = previously diagnosed cases of HTN (26 vs. 11) - in addition to newly discovered cases of HTN (20 vs. 5).

^cParticipants who accepted to give a blood sample for laboratory investigation - train drivers (n=92) & comparison group (n=93).

Table 4. Presenteeism among study groups measured by Stanford Presenteeism Scale (SPS-6).

Presenteeism	Train drivers n=100	Comparison group n=100	Test of significance and P value
	N (%)	N (%)	
Presenteeism			
Present	76(76)	31(31)	$\chi^2=40.7$ $P\leq 0.001$
Absent	24(24)	69(69)	
SPS-6 score^d			
≤18	54(71.1)	13(41.9)	$\chi^2=7.98$ $P=0.005$
>18	22(28.9)	18(58.1)	
Mean ±SD	15.7±3.7	19.2±2.9	t=4.8, $P\leq 0.001$

^dPercentage within presenteeism. SD=standard deviation.

Table 3 shows that the prevalence of obesity, hypertension, dyslipidemia and psychological distress are statistically significantly higher among train drivers compared to the comparison group ($P\leq 0.001$).

Table 4 shows that there is a higher prevalence of presenteeism among train drivers compared to the comparison group (76% and 31%, respectively) with a highly statistically significant difference ($P\leq 0.001$). In total, 54 persons out of 76 (71.1%) train drivers with presenteeism have lower scores (≤ 18) of the Stanford Presenteeism Scale and reduced performance at work compared to 13 persons out of 31 (41.9%) among the comparison group. The mean score of SPS-6 is significantly ($P\leq 0.001$) lower among train drivers (15.7±3.7) compared to the comparison group (19.2±2.9).

The bivariate analysis (Table 5) shows that all participants (100%) with psychological distress reported presenteeism. Furthermore, logistic regression analysis shows that being a train driver (AOR=5.4) and having hypertension (AOR=4.03) are independently associated with the likelihood of having presenteeism.

Discussion

Presenteeism is a term used when employees come into work despite physical or psychological health problems. So, they may not be able to fully perform their duties and are more likely to make mistakes on their job. In the present study, almost all physical complaints and morbidities were more frequent among train drivers compared to the comparison group with a statistically significant difference ($P\leq 0.05$) (Tables 2, 3). Train driving is a high-level job where the workers' ill health may lead directly to a serious incident affecting the rail network and public safety since, the vigilance and attention of train drivers are crucial to their job. They are also responsible for people's lives. So, going to work despite physical or psychological health problems (presenteeism) may increase the risk of occupational injuries and train accidents.

The number of existing studies on presenteeism among train drivers is scant, and most studies on presenteeism have analyzed healthcare workers especially nurses.^{33–36}

In the current study, there is a higher prevalence of presenteeism among train drivers (76%) compared to the comparison group (31%) with a high statistically significant difference ($P\leq 0.001$) (Table 4). Logistic regression analysis shows that being a train driver (AOR=5.4) is an independent predictor of presenteeism (Table 5).

Table 5. Logistic regression analysis of independent predictors of presenteeism among study groups.

Risk factors	Total	Presenteeism N (%)	COR (95%CI)	Logistic regression
	200	107(53.5)		AOR (95%CI)
Study group				
Train drivers	100	76(76)	7.05(3.8-13.2)***	5.4(2.8-10.4)
Comparison group	100	31(31)	(r)	(r)
Shift type				
Day	115	43(37.4)	(r)	
Night/alternating	85	64(75.3)	5.1(2.7-9.5)***	
Obesity				
Obese	74	51(68.9)	2.8(1.5-5.1)**	
Non obese	126	56(44.4)	(r)	
Hypertension				
Yes	62	50(80.6)	5.9(2.9-12.1)***	4.03(1.9-8.7)
No	138	57(41.3)	(r)	(r)
Dyslipidemia^e				
Yes	100	69(69)	4.3(2.3-7.9)***	
No	85	29(34.1)	(r)	
Psychological distress				
Yes	98	98(100)	Unlimited***	
No	102	9(8.8)	(r)	
Musculoskeletal symptoms				
Yes	96	61(63.5)	2.2(1.2-3.9)**	
No	104	46(44.2)	(r)	
Cardiovascular symptoms				
Yes	45	34(75.6)	3.5(1.6-7.3)***	
No	155	73(47.1)	(r)	
Neurological symptoms				
Yes	50	33(66)	1.9(1.02-3.9)*	
No	155	74(49.3)	(r)	

*, ** and *** = significant difference at $P \leq 0.05$, $P \leq 0.01$ and $P \leq 0.001$ respectively.

^eTotal for dyslipidemia =185 (15 subjects are missed).

The prevalence of presenteeism among Egyptian train drivers in the current study (76%) is shown to be similar to that of nurses (76.2%) working in hospitals of Croatia.³⁴ However, a lower prevalence of presenteeism (52%) was detected among railroad workers in Korea.¹² Also, a lower prevalence was detected in other occupations such as police officers in Sweden (46.5%),³⁷ workers at a food industrial company in Brazil (50.9%)⁵ and employees in South Korea (41.2%).³⁸

Presenteeism is usually common among workers whose occupations involve high job demands and relatively large individual responsibility, where the personnel are required to be in place, with minimal chance for temporary replacement such as; train drivers and health care providers. In such occupations, inadequate physical and psychological status of the affected workers can interfere with maintaining vigilance and concentration.^{35,37} Presenteeism is common among train drivers than other railway occupations due to higher job strain among train drivers.¹²

In the present work, bivariate analysis shows that all participants (100%) with psychological distress reported presenteeism (Table 5). Similarly, several studies support the positive association between psychological distress and presenteeism.^{11,39-41} Psychological health problems may be more linked to presenteeism than absenteeism because it may be more difficult to ensure that absence is due to this reason.²

Train drivers were exposed to several psychosocial risk factors in the workplace affecting their mental and psychological wellbeing and may result in mental and psychological health problems, such as; shift work, high job demands, limited decisional latitude and job insecurity which can adversely affect their health and directly influence the prevalence of presenteeism.^{14–16} Working night and/or alternating day and night shifts was shown to be associated with presenteeism in our study in bivariate analysis (Table 5). This was compliant with a study conducted upon Korean workers in which a higher presenteeism was reported among shift workers than non-shift workers.⁴² Shift workers are particularly vulnerable to long hours of duty and insufficient rest elevating their risk to develop presenteeism.

The current study revealed a positive association between different health conditions and presenteeism, logistic regression analysis shows that hypertension was an independent predictor for presenteeism (AOR=4.03) (Table 5). This was in agreement with a study conducted among Chinese workers where a higher prevalence of presenteeism was found among workers with high blood pressure.²⁰ Similarly in the United States, all individuals with hypertension were more likely to report lost productive time (LPT) while at work (presenteeism) compared to normotensive individuals.⁴³ However, there was no significant association between lost productivity and hypertension in a study conducted to assess the effect of different cardio-metabolic risk factors including hypertension on productivity.⁴⁴ The greater impact of hypertension on LPT and presenteeism can be explained by hypertension being largely undertreated despite its high prevalence rates,⁴⁵ probably due to late access to health care and poor compliance to medication regimens resulting in inadequate control of hypertension, so, the workers may go to work while ill (hypertensive).^{46,47}

A significant association between presenteeism and obesity was detected in bivariate analysis (Table 5) which was similarly found in workers in Petrochemical industry in China²⁰ and workers at a food industrial company in Brazil.⁵ This could be attributed to sedentary work of train drivers and its negative impact on their health. Sedentary work with insufficient movement and muscle activity, low energy expenditure and lack of changes in posture may result in low physical activity and obesity.⁴⁸ Also, the high job demands among train drivers can cause stress and unhealthy dietary behaviors that may result in obesity and increase its negative impact on health and consequently greater adverse workplace effects such as presenteeism.⁴⁹ Furthermore, obesity is considered an important risk factor for cardiovascular disease, as it can increase the prevalence and severity of cardiovascular risk factors such as; diabetes mellitus (type II), dyslipidemia and hypertension.⁵⁰ So, it can significantly exacerbate the adverse effects of these conditions on productivity.⁴⁴

Moreover, the present findings revealed a significant association between musculoskeletal complaints and presenteeism among train drivers (Table 5). Correspondingly in Brazil, a positive association was found between presenteeism and occurrence of musculoskeletal symptoms.⁵ Musculoskeletal problems may interfere with work and daily life activities as a result of functional limitations. They also arouse feelings of ineffectiveness and uselessness resulting in a lack of productivity.⁵¹ So, targeting and assessment of the underlying health risks that might lead to presenteeism in the workplace is a critical issue for its control and management.

Conclusions

In the present study, the prevalence of presenteeism and its associated risk factors are significantly higher among train drivers than the comparison group. All participants with psychological distress reported presenteeism. Being a train driver and having hypertension are independently associated with the likelihood of having presenteeism. There is an urgent need for the railway industry to understand the factors that contribute to presenteeism. Of particular interest are, the use of effective health promotion programs and effective physical and psychological assessment that may play a role in increasing worker productivity and reduction in presenteeism. Provision of enough rest periods after shifts, and regulation of work to facilitate sick leaves when needed are recommended to ameliorate presenteeism. A large scale national study including all train drivers is recommended.

Study limitations

The study was conducted in single locality with a relatively small sample size. So, the results can't be generalized to all train drivers. There is a possibility of recall bias in physical complaints such as; musculoskeletal, cardiovascular and neurological complaints.

Data availability

Underlying data

Harvard Dataverse: Presenteeism and associated factors among railway train drivers. <https://doi.org/10.7910/DVN/CG8Z1K>.⁵²

Extended data

Harvard Dataverse: questionnaire and informed consent form for “Presenteeism and associated factors among railway train drivers”. <https://doi.org/10.7910/DVN/ZGY5UB>.⁵³

This project contains the following extended data:

- informed written consent.doc
- questionnaire.docx

Data are available under the terms of the [Creative Commons Zero “No rights reserved” data waiver](#) (CC0 1.0 Public domain dedication).

Acknowledgements

The authors would like to acknowledge Mansoura railway station administration for their help and support. Also, we thank the participants for their participation in the study.

References

1. Koopman C, Pelletier KR, Murray JF, et al.: **Stanford presenteeism scale: health status and employee productivity.** *J. Occup. Environ. Med.* 2002 Jan 1; **44**: 14–20.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Reference Source](#)
2. Johns G: **Presenteeism in the workplace: A review and research agenda.** *J. Organ. Behav.* 2010 May; **31**(4): 519–542.
[Publisher Full Text](#)
3. Queiroz-Lima ME, Serranheira F: **Absenteeism and presenteeism costs from occupational accidents with WRMSDs in a Portuguese hospital.** *Dyna.* 2016 Apr; **83**(196): 27–30.
[Publisher Full Text](#)
4. Hui SK, Grandner MA: **Trouble sleeping associated with lower work performance and greater healthcare costs: longitudinal data from Kansas state employee wellness program.** *Journal of Occupational and Environmental Medicine/American College of Occupational and Environmental Medicine.* 2015 Oct; **57**(10): 1031–1038.
[PubMed Abstract](#) | [Publisher Full Text](#)
5. Silva BM, Zanatta AB, de Lucca SR: **Prevalence of presenteeism among workers of an industrial company.** *Revista brasileira de medicina do trabalho.* 2017; **15**(3): 236–243.
[PubMed Abstract](#) | [Publisher Full Text](#)
6. Dew K, Keefe V, Small K: **‘Choosing’ to work when sick: workplace presenteeism.** *Soc. Sci. Med.* 2005 May 1; **60**(10): 2273–2282.
[Publisher Full Text](#)
7. Gosselin E, Lemyre L, Corneil W: **Presenteeism and absenteeism: differentiated understanding of related phenomena.** *J. Occup. Health Psychol.* 2013 Jan; **18**(1): 75–86.
[PubMed Abstract](#) | [Publisher Full Text](#)
8. Baldonado-Mosteiro M, Sánchez-Zaballos M, Rodríguez-Díaz FJ, et al.: **Adaptation and validation of the Stanford Presenteeism Scale-6 in healthcare professionals.** *Int. Nurs. Rev.* 2020 Mar; **67**(1): 109–117.
[PubMed Abstract](#) | [Publisher Full Text](#)
9. Hilton MF, Whiteford HA: **Interacting with the public as a risk factor for employee psychological distress.** *BMC Public Health.* 2010 Dec; **10**(1): 1–7.
[PubMed Abstract](#) | [Publisher Full Text](#)
10. Callen BL, Lindley LC, Niederhauser VP: **Health risk factors associated with presenteeism in the workplace.** *J. Occup. Environ. Med.* 2013 Nov 1; **55**(11): 1312–1317.
[Publisher Full Text](#) | [Reference Source](#)
11. Coutu MF, Corbiere M, Durand MJ, et al.: **Factors associated with presenteeism and psychological distress using a theory-driven approach.** *J. Occup. Environ. Med.* 2015 Jun 1; **57**(6): 617–626.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Reference Source](#)
12. Ryu IS, Jeong DS, Kim IA, et al.: **Association between job stress, psychosocial well-being and presenteeism, absenteeism: focusing on railroad workers.** *Korean Journal of Occupational and Environmental Medicine.* 2012 Sep 1; **24**(3): 263–273.
[Publisher Full Text](#)
13. Loukazadeh Z, Zare ZO, Mehrparvar AH, et al.: **Fitness-for-work assessment of train drivers of Yazd railway, central Iran.** *Int. J. Occup. Environ. Med.* 2013 Jul 1; **4**(3): 157–163.
[PubMed Abstract](#) | [Publisher Full Text](#)
14. Hertz RP, Unger AN, McDonald M, et al.: **The impact of obesity on work limitations and cardiovascular risk factors in the US workforce.** *J. Occup. Environ. Med.* 2004 Dec 1; **46**: 1196–1203.
[PubMed Abstract](#) | [Reference Source](#)
15. Selligmann-Silva E: **Presenteísmo em diferentes países.** *Rev. Proteção.* 2011.
[Reference Source](#)
16. de Lucca SR: **Application of an instrument for diagnosis of psychosocial risk factors in organizations/Aplicação de instrumento para o diagnóstico dos fatores de risco psicossociais nas organizações.** *Revista Brasileira de Medicina do Trabalho.* 2017 Jan 1; **15**(1): 63–72.
[Publisher Full Text](#) | [Reference Source](#)
17. Schultz AB, Edington DW: **Employee health and presenteeism: a systematic review.** *J. Occup. Rehabil.* 2007 Sep; **17**(3): 547–579.
[Publisher Full Text](#)
18. Steultjens E, Baker N, Aas RW: **Organizational leadership, health risk screening, individually tailored programs, and supportive workplace culture might reduce presenteeism.** *Aust. Occup. Ther. J.* 2012; **59**(3): 247–248.
[PubMed Abstract](#) | [Publisher Full Text](#)
19. Mina R, Casolin A: **National standard for health assessment of rail safety workers: the first year.** *Med. J. Aust.* 2007 Oct; **187**(7): 394–397.
[PubMed Abstract](#) | [Publisher Full Text](#)
20. Yu J, Wang S, Yu X: **Health risk factors associated with presenteeism in a Chinese enterprise.** *Occup. Med.* 2015 Dec 1; **65**(9): kqv115–kqv738.
[Publisher Full Text](#)
21. Hemp P: **Presenteeism: at work-but out of it.** *Harv Bus Rev.* 2004 Oct 1; **82**(10): 49–58.
22. World Health Organization: *International Statistical Classification of Diseases and Related Health Problems 10th Revision (ICD-10)-WHO Version for 2016.* Geneva: WHO; 2016.
[Reference Source](#)
23. Kessler RC, Andrews G, Colpe LJ, et al.: **Short screening scales to monitor population prevalences and trends in non-specific psychological distress.** *Psychol. Med.* 2002 Aug; **32**(6): 959–976.
[PubMed Abstract](#) | [Publisher Full Text](#)
24. Yiengprugsawan V, Kelly M, Tawatsupa B: **Kessler Psychological Distress Scale.** Michalos AC, editors. *Encyclopedia of Quality of Life and Well-Being Research.* Dordrecht: Springer; 2014; 1–3.
[Publisher Full Text](#)
25. Easton SD, Safadi NS, Wang Y, et al.: **The Kessler psychological distress scale: translation and validation of an Arabic version.** *Health Qual. Life Outcomes.* 2017 Dec; **15**(1): 215.
[PubMed Abstract](#) | [Publisher Full Text](#)

26. Aronsson G, Gustafsson K, Dallner M: **Sick but yet at work. An empirical study of sickness presenteeism.** *J. Epidemiol. Community Health.* 2000 Jul 1; **54(7)**: 502-509.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
27. Muntner P, Shimbo D, Carey RM, *et al.*: **Measurement of blood pressure in humans: a scientific statement from the American Heart Association.** *Hypertension.* 2019 May; **73(5)**: e35-e66.
[PubMed Abstract](#) | [Publisher Full Text](#)
28. Chobanian AV, Bakris GL, Black HR, *et al.*: **The seventh report of the joint national committee on prevention, detection, evaluation, and treatment of high blood pressure: the JNC 7 report.** *JAMA.* 2003 May 21; **289(19)**: 2560-2572.
[PubMed Abstract](#) | [Publisher Full Text](#)
29. World Health Organization: **Obesity: preventing and managing the global epidemic.** Geneva: World Health Organization; 2000.
30. Consultation WE: **Appropriate body-mass index for Asian populations and its implications for policy and intervention strategies.** *Lancet (London, England).* 2004 Jan 10; **363(9403)**: 157-163.
[PubMed Abstract](#) | [Publisher Full Text](#)
31. Nielsen TR, Lausten-Thomsen U, Fonvig CE, *et al.*: **Dyslipidemia and reference values for fasting plasma lipid concentrations in Danish/North-European White children and adolescents.** *BMC Pediatr.* 2017 Dec; **17(1)**: 111-116.
[PubMed Abstract](#) | [Publisher Full Text](#)
32. Rhee EJ, Kim HC, Kim JH, *et al.*: **2018 Guidelines for the management of dyslipidemia in Korea.** *Journal of Lipid and Atherosclerosis.* 2019 Sep 1; **8(2)**: 78-131.
[PubMed Abstract](#) | [Publisher Full Text](#)
33. Martinez LF, Ferreira AI: **Sick at work: presenteeism among nurses in a Portuguese public hospital.** *Stress. Health.* 2012 Oct; **28(4)**: 297-304.
[PubMed Abstract](#) | [Publisher Full Text](#)
34. Brborović H, Brborović O, Brumen V, *et al.*: **Are nurse presenteeism and patient safety culture associated: a cross-sectional study.** *Arh. Hig. Rada Toksikol.* 2014 Jun 11; **65(2)**: 149-156.
[PubMed Abstract](#) | [Publisher Full Text](#)
35. Homrich PH, Dantas-Filho FF, Martins LL, *et al.*: **Presenteeism among health care workers: literature review.** *Revista Brasileira de Medicina do Trabalho.* 2020; **18(1)**: 97-102.
[PubMed Abstract](#) | [Publisher Full Text](#)
36. Imai C, Hall L, Lambert SB, *et al.*: **Presenteeism among health care workers with laboratory-confirmed influenza infection: A retrospective cohort study in Queensland, Australia.** *Am. J. Infect. Control.* 2020 Apr 1; **48(4)**: 355-360.
[PubMed Abstract](#) | [Publisher Full Text](#)
37. Leineweber C, Westerlund H, Hagberg J, *et al.*: **Sickness presenteeism among Swedish police officers.** *J. Occup. Rehabil.* 2011 Mar; **21(1)**: 17-22.
[PubMed Abstract](#) | [Publisher Full Text](#)
38. Yi JS, Kim H: **Factors related to presenteeism among South Korean workers exposed to workplace psychological adverse social behavior.** *Int. J. Environ. Res. Public Health.* 2020 Jan; **17(10)**: 3472.
[PubMed Abstract](#) | [Publisher Full Text](#)
39. Miraglia M, Johns G: **Going to work ill: A meta-analysis of the correlates of presenteeism and a dual-path model.** *J. Occup. Health Psychol.* 2016 Jul; **21(3)**: 261-283.
[PubMed Abstract](#) | [Publisher Full Text](#)
40. Yang T, Shen YM, Zhu M, *et al.*: **Effects of co-worker and supervisor support on job stress and presenteeism in an aging workforce: a structural equation modelling approach.** *Int. J. Environ. Res. Public Health.* 2016 Jan; **13(1)**: 72.
[PubMed Abstract](#) | [Publisher Full Text](#)
41. Skela-Savič B, Pesjak K, Hvalič-Toužers S: **Low back pain among nurses in Slovenian hospitals: cross-sectional study.** *Int. Nurs. Rev.* 2017 Dec; **64(4)**: 544-551.
[PubMed Abstract](#) | [Publisher Full Text](#)
42. Jeon SH, Leem JH, Park SG, *et al.*: **Association among working hours, occupational stress, and presenteeism among wage workers: results from the Second Korean Working Conditions Survey.** *Ann. Occup. Environ. Med.* 2014 Dec; **26(1)**: 6.
[PubMed Abstract](#) | [Publisher Full Text](#)
43. Unmuessig V, Fishman PA, Vrijhoef HJ, *et al.*: **Association of controlled and uncontrolled hypertension with workplace productivity.** *J. Clin. Hypertens.* 2016 Mar; **18(3)**: 217-222.
[PubMed Abstract](#) | [Publisher Full Text](#)
44. Sullivan PW, Ghushchyan V, Ben-Joseph RH: **The effect of obesity and cardiometabolic risk factors on expenditures and productivity in the United States.** *Obesity.* 2008 Sep; **16(9)**: 2155-2162.
[PubMed Abstract](#) | [Publisher Full Text](#)
45. Goldstein LB, Bushnell CD, Adams RJ, *et al.*: **Guidelines for the primary prevention of stroke: a guideline for healthcare professionals from the American Heart Association/American Stroke Association.** *Stroke.* 2011 Feb; **42(2)**: 517-584.
[Publisher Full Text](#)
46. Centers for Disease Control and Prevention (CDC): **Vital signs: prevalence, treatment, and control of hypertension—United States, 1999-2002 and 2005-2008.** *MMWR Morb. Mortal. Wkly Rep.* 2011 Feb 4; **60(4)**: 103-108.
47. Mitchell RJ, Bates P: **Measuring health-related productivity loss.** *Popul. Health Manag.* 2011 Apr 1; **14(2)**: 93-98.
[PubMed Abstract](#) | [Publisher Full Text](#)
48. Straker L, Dunstan D, Gilson N, *et al.*: **Sedentary work. Evidence on an emergent work health and safety issue – Final Report.** Canberra: Safe Work Australia; 2016.
49. Borak J: **Obesity and the workplace.** *Occup. Med.* 2011 Jun 1; **61(4)**: 220-222.
[Publisher Full Text](#)
50. Prospective Studies Collaboration: **Body-mass index and cause-specific mortality in 900 000 adults: collaborative analyses of 57 prospective studies.** *Lancet.* 2009 Mar 28; **373(9669)**: 1083-1096.
[PubMed Abstract](#) | [Publisher Full Text](#)
51. Santos HE, Marziale MH, Felli VE: **Presentismo y síntomas musculoesqueléticos entre trabajadores de enfermería.** *Rev. Lat. Am. Enfermagem.* 2018 May 7; **26**: e3006.
[PubMed Abstract](#) | [Publisher Full Text](#)
52. Awaad A: **Presenteeism and associated factors among railway train drivers.** [Dataset] Harvard Dataverse, 2022, V2, UNF:6: QiDsEFG9IEVvgZ4c6Qi1A== [fileUNF].
[Publisher Full Text](#)
53. Awaad A: **Replication Data for: questionnaire and informed consent for Presenteeism and associated factors among railway train drivers.** *Harvard Dataverse.* 2022; **V1**.
[Publisher Full Text](#)

Open Peer Review

Current Peer Review Status:  

Version 2

Reviewer Report 27 June 2022

<https://doi.org/10.5256/f1000research.134451.r139552>

© 2022 McGregor A. This is an open access peer review report distributed under the terms of the [Creative Commons Attribution License](#), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.



Alisha McGregor 

School of Psychology, University of Wollongong, Wollongong, NSW, Australia

I have looked at the authors revisions and are happy to endorse this article.

Competing Interests: No competing interests were disclosed.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Reviewer Report 21 June 2022

<https://doi.org/10.5256/f1000research.134451.r140098>

© 2022 ElSafty A. This is an open access peer review report distributed under the terms of the [Creative Commons Attribution License](#), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.



Amal ElSafty 

Department of Occupational and Environmental Medicine, Faculty of Medicine, Cairo University, Giza, Egypt

This is an interesting study and generally well written and structured. The authors have collected data from all working population so results can be fairly extrapolated. It can be also of great importance, especially with the recent increase of train accidents in Egypt.

Below I have provided few remarks, and other than that, from my point of view it is accepted for indexing.

1. Comments on Table 2 in the results, ignore the respiratory complaints and no discussion on this item.

2. 2nd sentence in the first paragraph in the discussion studied the impact of presenteeism on work performance, however this manuscript is investigating the effect of presenteeism on train driver's health. This sentence can be used to suggest a warning sign for probable accidents because of high presentism among the studied train drivers.
3. 8th paragraph in discussion demonstrated the relation between presentism and hypertension. The second half of this paragraph mostly explains hypertension with lost productive time (LPT), which is not studied in this research.
4. Recommendations might also include the importance of occupational psychologist to combat stressors and proper.

Is the work clearly and accurately presented and does it cite the current literature?

Yes

Is the study design appropriate and is the work technically sound?

Yes

Are sufficient details of methods and analysis provided to allow replication by others?

Yes

If applicable, is the statistical analysis and its interpretation appropriate?

Yes

Are all the source data underlying the results available to ensure full reproducibility?

Yes

Are the conclusions drawn adequately supported by the results?

Yes

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Occupational and Environmental Medicine

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Version 1

Reviewer Report 25 May 2022

<https://doi.org/10.5256/f1000research.123725.r136241>

© 2022 McGregor A. This is an open access peer review report distributed under the terms of the [Creative Commons Attribution License](#), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.



Alisha McGregor 

School of Psychology, University of Wollongong, Wollongong, NSW, Australia

Thanks for giving me the opportunity to review this article on presenteeism amongst train drivers in Egypt.

I have some comments for consideration below.

- In the intro, the author says that presenteeism results in greater productivity losses than absenteeism, which is correct over the long term; However, on any given day that a worker chooses presenteeism over absenteeism they are going to be more productive. In that even if they are only 20% productive when they come into work ill this is still more than if they chose to take the day off (i.e., 0% productivity). I think this should be considered when talking about productivity losses associated with presenteeism compared to absenteeism.
- The author has used Aronsson and Gustafsson definition of presenteeism in the intro but then measures the construct using the SPS-6 scale which incorporates productivity into the measure. The author could consider modifying their definition of the construct to be consistent with the way they have measured presenteeism in the study.
- Very limited discussion of the predictors of presenteeism in the intro, this could be expanded upon.
- In the methods section - the use of the heading 'flow of work' seems odd. I have never seen the study procedure described in this way. Please review.

Is the work clearly and accurately presented and does it cite the current literature?

Yes

Is the study design appropriate and is the work technically sound?

Partly

Are sufficient details of methods and analysis provided to allow replication by others?

Yes

If applicable, is the statistical analysis and its interpretation appropriate?

Yes

Are all the source data underlying the results available to ensure full reproducibility?

No source data required

Are the conclusions drawn adequately supported by the results?

Yes

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Presenteeism

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Author Response 25 May 2022

Asmaa Awaad, Faculty of Medicine, Mansoura University, Mansoura, Egypt

We thank Dr. McGregor for reviewing our manuscript. We present our responses below each comment as well as a new version of our manuscript (Version #2)

In the intro, the author says that presenteeism results in greater productivity losses than absenteeism, which is correct over the long term; However, on any given day that a worker chooses presenteeism over absenteeism they are going to be more productive. In that even if they are only 20% productive when they come into work ill this is still more than if they chose to take the day off (i.e., 0% productivity). I think this should be considered when talking about productivity losses associated with presenteeism compared to absenteeism.

Response: Thank you, the term "over the long term" is added to the sentence (presenteeism involves higher productivity losses than absenteeism over the long term)

The author has used Aronsson and Gustafsson definition of presenteeism in the intro but then measures the construct using the SPS-6 scale which incorporates productivity into the measure. The author could consider modifying their definition of the construct to be consistent with the way they have measured presenteeism in the study.

Response: Thank you, the definition is modified to be consistent with the way we have measured presenteeism in the study.

Very limited discussion of the predictors of presenteeism in the intro, this could be expanded upon.

Response: Thank you, pain including; musculoskeletal and neurological pain are added to the predictors of presenteeism in the intro.

In the methods section - the use of the heading 'flow of work' seems odd. I have never seen the study procedure described in this way. Please review.

Response: Thank you, the heading 'flow of work' is replaced by "study procedure"

Competing Interests: Authors declare that there are no competing interests.

The benefits of publishing with F1000Research:

- Your article is published within days, with no editorial bias
- You can publish traditional articles, null/negative results, case reports, data notes and more
- The peer review process is transparent and collaborative
- Your article is indexed in PubMed after passing peer review
- Dedicated customer support at every stage

For pre-submission enquiries, contact research@f1000.com

F1000Research