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Title: Variables that predict burnout in professional drivers

Abstract

Background: Stress maintained over time leads to a state of exhaustion known as burnout syndrome. This syndrome constitutes an occupational health problem, leading to high absenteeism. It can also mean that workers come to the workplace feeling unwell, which increases occupational collisions and injuries at work. In this study we developed a predictive model of burnout in professional drivers using the following indicators: age, hours worked, seniority, educational level, fatigue, personality, attitudes towards driving, safety behaviors in the vehicle, and work characteristics and content. **Method:** A total of 523 professional drivers from different transport sectors, obtained through non-probability sampling, participated in the study. We used the SPSS version 25.0 program to analyze the data. **Results:** We determined the predictive capacity of certain variables that affect drivers and cause burnout. Exhaustion can be predicted with Fatigue (48.8%), Professional efficiency with Emotional Stability (39.8%) and Cynicism with Lack of motivation (28%) being the best predictors. **Conclusions:** The results contribute to a better knowledge of those factors that cause burnout in professional drivers. It is important to design individual interventions to reduce burnout, which would help reduce sick leave and possible collisions, in addition to providing greater wellbeing for drivers.

Keywords: Professionals Drivers; Burnout; Personality; Work Characteristics, Occupational Health; Labor risks.

1. Introduction

Work stress is an increasingly frequent phenomenon in our society. This stress maintained over time leads the person to enter a state of exhaustion known as burnout syndrome. This syndrome is an occupational health problem. Burnout syndrome is an advanced phase of work stress and is the cause of high absenteeism and workers leaving their profession. We are therefore talking about an imbalance between the worker's expectations and the reality of their daily work (1).

According to the European Agency and Health at Work, burnout has negative effects for the organization because it causes poor performance at the overall company level due to the increase in absenteeism and because workers come to work feeling tired and sick and are therefore not effective (presenteeism). This leads to higher rates of collisions and injuries at work. Furthermore, these absences tend to be longer, producing high costs for both companies and society (2).

Maslach and Jackson (3) described burnout as a multidimensional model characterized by exhaustion, depersonalization, and reduced personal fulfillment that, pushed to the limit, could lead to death. Thus, burnout is a progressive and dynamic process that is produced by an accumulation of negative stimuli and an inadequate way of managing chronic work stress, that is, factors related to work, the company and also to the worker’s situation and personality (4).

In the case of professional drivers, we find that the characteristics of their work cause them stress, and this stress ends up becoming burnout (5). Stress and exhaustion in bus drivers are related to traffic collisions (6). Arias et al. (7) found a high percentages of burnout in public transport drivers. These drivers showed high levels of emotional exhaustion and depersonalization. Various authors have also linked driving with burnout (7–11). Burnout has

also been found to be a mediating variable between compliance with regulations and improper driving behaviors (12), which makes it an important factor in preventing traffic collisions. Burnout is a pathological entity that occurs due to chronic stress in those who provide public care services or care for other people (1). There is a high incidence of this syndrome in health professionals, and specialties such as intensive care workers, primary care, palliative care and oncology are particularly affected (13–15). Nurses are also a widely studied group (16–18), as well as teachers (19,20), and firefighters (21,22).

However, there are few studies on the impact of burnout on professional drivers, although its incidence in railway personnel (23), and ambulance drivers (24) has been studied. In addition, the prevalence of job stress and burnout are significantly high among bus drivers (6,7), and burnout has also been associated with the mental load of these drivers (8). It has been related in particular to cynicism, which is possibly related to the cognitive area and manifests itself in self-criticism and personal devaluation that potentially leads to distrust and contempt for work (25).

The predictive variables of burnout have also been extensively studied. Quiceno and Alpi (26) summarize them in personal components such as age, gender, family variables, and personality; Inadequate training; Labor or professional factors such as labor organization, working conditions, social support and work overload; Social factors such as the need for prestige or social consideration; and environmental factors such as significant life changes (deaths, marriage, divorce, etc.). In addition, it has been verified that informality, independent work, vehicle expenses and long working hours, including nights and holidays, increase stress in taxi drivers (27). These authors found that 70% of taxi drivers had emotional burnout, 66% scored highly in cynicism and 44% in personal efficacy, concluding that these workers experience a large number of situations that lead to burnout. Shi and Zhang (12) warned that personality traits can predict driving behaviors, concluding that they have not

been sufficiently studied. Taylor and Dorn (28) related stress and fatigue in bus drivers to the risk of collisions. In bus drivers, stress was associated with exhaustion, traffic collisions and pressure for not being late, which forces them to behave in risky ways and load passengers in a hurry (6,29).

The relationship between stress and long working hours and responsibility for passenger safety has been studied (30). Driving for long hours has been found to be related to a higher risk of collisions and a greater severity of these (31,32). Therefore, fatigue at work is related to the number of hours worked (33). Working for more than 12 hours a day and excessive daytime sleepiness have been associated with constant risky driving (34), an increased probability that the driver will go out of their lane and a decreased reaction time for sudden braking (35). In addition, fatigue has contributed greatly to trucking collisions (36–38). There is clear evidence of the association between traffic collisions and fatigue and shift work mainly due to sleep loss, so that sustained vigilance and reaction time are affected (31,39). Lack of sleep can be a predictor variable of burnout (40), and sleep disturbance is the most powerful predictor of mental fatigue (burnout) (41).

In terms of job characteristics, Quiceno and Alpi (26) indicated that social factors could predict burnout. In truck drivers, a positive correlation has been found between the three dimensions of burnout and role ambiguity, which has been positively related to low personal achievement (42). Just as work or professional factors such as work organization, working conditions, social support and work overload could influence burnout, it has also been found that task identity positively predicts relaxed driving and hazard prevention, job feedback negatively predicts fatigue and anxiety, and feedback from agents negatively predicts alertness and vigilance (43). Therefore, these factors could also influence burnout in professional drivers. The work characteristics become vitally important when we find that

fatigue and the need for recovery are moderating variables in the association between social support and risky driving (44).

Other variables, such as the driver's age, have a negative effect on performance due to the decrease in reaction times with age (45). It has also been found that lack of sleep affects young people significantly more than older subjects, whose performance is not altered (46).

Personality variables have been studied little in this group. It has been found that high scores in the variables "search for experiences" and extraversion make drivers more prone to driving errors related to fatigue in undemanding road environments (47). However, it has also been found that conscientiousness positively predicts prevention of dangers and agreeableness negatively predicts the search for sensations in professional drivers (43).

After looking at the relationship that these variables have in other groups, we set ourselves the objective of studying their predictive power in professional drivers. We considered the following hypothesis:

H_1: If burnout in the professional driver is influenced by age, hours worked, seniority, educational level, fatigue, job characteristics (JDS), personality (OPERAS), safety behaviors in the vehicle, the content of the work (JCQ) and the attitudes towards driving, then a good prediction of burnout can be made with a model that includes these predictors.

2. Method

2.1. Participants

The sample was made up of 523 professional drivers (91.3 % men, 8.7 % women), and the average age was 41.6 (*SD*= 13.01). The civil status was: married or in a couple relationship (69.1 %), single (22.1 %), separated/divorced (8.1 %) and widowed (0.7 %). The educational level of the participants was: university studies (3.4 %), upper secondary school, Professional Training-I or Compulsory secondary education diploma (50.3 %), lower

secondary school, Professional Training-II or Prep School (22.1 %), and not finished primary education (24.2 %). The average years of experience was 12.07 (SD=12.21). The job characteristics were: transport of merchandise (46.8%), transport of machinery (4.4%), passenger transportation (22.7 %), ambulances and assistance drivers (7.8 %), taxi drivers (12.6 %) and others (5.5 %).

2.2. Instruments

Maslach Burnout Inventory (MBI-GS; Salanova, Schaufeli, Llorens, Peiró, & Grau, (2000) assesses burnout, it consists of three scales and 15 items that are answered using a 7-point Likert scale (0 = *Never* to 6 = *Always / Everyday*). The instrument measures: Exhaustion (5 items; α = 0.87; e.g. "6.-I am 'burned out' by work"), Cynicism (4 items; α = 0.85; e.g. "9. I have lost enthusiasm for my work") and Professional efficiency (6 items; α = 0.78; e.g. “12.- I have achieved many valuable things in this position").

Driver Fatigue (DF-8)(49), is an 8-item unifactorial scale with Likert type response format (α = 0.88), (e.g., “3. Driving nerves cause me physical discomfort”). The response format of the items was a Likert-type scale from 1 to 5 (1 = *Never* to 5 = *Always*).

The Overall Personality Assessment Scale (OPERAS) (50) is a questionnaire based on the Big Five personality traits. It consists of 40 items that are answered using a 5-point Likert scale (*1 = totally disagree* to *5 = totally agree*). This instrument measures Agreeableness (α = 0.71; e.g. “6. I usually speak well of others”), Extraversion (α = 0.86; e.g. “20. I make friends easily”), Conscientiousness (α = 0.77; e.g. “22. I leave my things untidy”), Emotional Stability (α = .86; e.g. “15. I often feel sad”) and Openness to Experience (α = 0.81; e.g. “30. I like living in new places”).

The Job Diagnostic Survey (JDS-21) (51,52), in the Spanish version (53), evaluates the work characteristics that influence work results. It consists of seven subscales with three items each. The response format is a 7-point Likert scale (1 = *Very little* to 7 = *A lot*). 1. Skill

variety (α = 0.78; e.g. "1.- The job requires me to use complex skills or a high level of specialization"), 2. Task identity (α = 0.78; e.g. "11.- The work allows me to completely finish the tasks I undertake"), 3. Significance (α = 0.71; e.g. "14.- The work itself is not very significant or important in the general context"), 4. Autonomy (α = 0.73; e.g. "9.- The work does not give me any opportunities to use my initiative or personal judgment"), 5. Feedback (α = 0.70; e.g. "12.- The work itself provides me with very few indications about my performance"), 6. Feedback from agents (α = 0.70; e.g. "10.- My superiors often let me know what they think about my performance at work"), and 7.- Dealing with others in their jobs (α = 0.72; e.g. "6.- The work can be carried out by a single person without consulting other people").

We used the Spanish version (54) of the Job Content Questionnaire (JCQ-25) (55). This scale is used to analyze work situations in which stressors are chronic and pays particular attention to the psychosocial characteristics of the work environment. It is made up of 28 items in three factors: Job Demands (9 items, α = 0.74; e.g. "19.- My work requires a lot of hard work"), assesses the amount of work, the intellectual demands and the pressure of working time; Job Control (9 items; α = 0.74; e.g. "4.- My work allows me to make many decisions by myself") assesses the possibility of making decisions creatively and applying and developing one's own abilities; and Support (11 items; α = 0.87; e.g. "41.- The people I work with are interested in me") assesses the support received from colleagues and superiors. It has a four-point Likert scale response format (0 = *Strongly disagree* to 3 = *Strongly agree*).

We used the Spanish version (56) of the Attitudes Towards Safety Regulations Scale (ATSRS) (57), which consists of three factors: F1. Effectiveness of Enforcement (5 items; α = 0.81; e.g. "1. The existing safety regulations are consistently applied across states"); F2. General Regulatory Attitudes (4 items; α = 0.80; e.g. "8. Safety regulations in general have placed unfair burdens on truckers"); F3. Regulatory Effectiveness (4 items; α = 0.70; e.g. "13.

Regulations that do not let truckers perform certain maneuvers help keep roads safe"). It has a 7-point Likert type response format (1 = *Totally disagree* to 7 = *Totally agree*).

We used the Swedish Occupational Fatigue Inventory (SOFI) (58), in the Spanish version (59). It consists of five subscales of three items each: "F1. Lack of energy" (α = 0.92; e.g.: "12. Exhausted, for example, having low energy"); "F2. Physical exertion" (α = 0.87; e.g.: "1.- With palpitations, for example, in the heart"); "F3. Physical discomfort" (α = 0.81; e.g.: "8. Having stiff joints, for example, in the elbows, knees, etc."); "F4. Lack of motivation" describes the feeling of not feeling involved or excited (α = 0.92; e.g.: "5.- Apathetic, for example, feeling very left out"); and "F5. Sleepiness" describes the feelings of drowsiness (α = 0.89; e.g.: "6.- Falling asleep, for example, being sleepy"). The items are answered using a 10-point Likert scale (0 = N*othing at all* to 10 = A *lot*).

The Trans-18 Scale (TRANS-18) (60) detects personal safety levels as well as safety in vehicle behaviors and psychophysiological disorders. The response format is a 5-point evaluation scale (1 = *Never* to 5 = *Always*). The scale consists of three factors and 18 items: "F1. Psychophysiological disorders of the driver" (α = 0.81; e.g.: "8. My job has at some time caused me digestive problems (e.g. constipation)"); "F2. Personal safety behaviors" (α = 0.80; e.g.: "7.- I avoid driving while smoking and I don't hold the cigarette, cigar in my hand"); and "F3. Safety behaviors in the vehicle" (α = 0.70; e.g.: "18.- I take a rest after every 4 hours of driving.").

2.3. Procedure

To obtain the sample, we used non-probability sampling (61) also known as accidental-random sampling (62). Participants were informed that the data obtained are completely confidential and anonymous and they answered voluntarily and did not receive any kind of compensation. A protocol (PAPI) was prepared for the participant that included a cover letter,

informed consent and the questionnaires to be answered. The questionnaires were answered at their usual workplace. The confidentiality of the data provided by participants is fully guaranteed. The response rate was 86%.

2.4. Data Analysis

We started by using Pearson's correlation coefficients to calculate the correlations between the predictor variables and the criterion variable. We then calculated multiple regressions using the stepwise option with the IBM SPSS version 25 program (63).

This method incorporates the variables into the regression model. There were twenty variables: Age, Gender, Seniority, Education Level, Driver Fatigue (DF-8), Lack of energy (SOFI.1), Physical exertion (SOFI.2), Physical discomfort (SOFI.3), Lack of motivation (SOFI.4), Sleepiness (SOFI.5), Extraversion (OP.EX), Emotional Stability (OP.EE), Responsibility (OP.CO), Agreeableness (OP.Ag) and Openness to experience (OP.OE), Psychophysiological Disorders (Trans.1), Personal Safety Behaviors (Trans. 2) and Vehicle Safety Behaviors (Trans. 3), Variety (JDS.1), Identity (JDS.2), Significance (JDS.3), Autonomy (JDS.4), Feedback (JDS.5), Agents (JDS.6), Dealing with others (JDS.7), Social Support (JCQ.SS), Job Demand (JCQ-JD), Job Control (JCQ.JC), Effectiveness of Enforcement (ATRS.ENF), General Regulatory Attitudes (ATRS.ATT) and Regulatory Effectiveness (ATRS.EFF).

3. Results

3.1. Reliability analysis

Table 1 shows the instruments used and their internal consistency index. The indices are appropriate given that they range between 0.71 Dealing with others (JDS.7) and 0.89 Sleepiness (SOFI.5).

INSERT TABLE 1 HERE

3.2. Correlation analyses

The correlation analysis is shown in Table 2. The results show that Exhaustion correlates positively with 9 variables and negatively with 16 variables. The Cynicism variable correlated with 19 variables negatively, and with 8 variables positively. Professional efficiency correlated positively with 22 variables and negatively with seven.

INSERT TABLE 2 HERE

3.3. Multiple regression

A multiple regression model was performed to test the effects that predictor variables (thirty-one) have on criterion variables in connection with burnout in professional drivers. Tables 3 to 5 show the data corresponding to the adjusted *R*2 indices and the significant typified beta coefficients between the criteria variables and the predictive variables of this study. The objective of the models studied is to identify the degree to which these predictor variables will be able to predict the three dimensions of burnout (Figure 1).

INSERT FIGURE 1 HERE

Table 3 shows the model as the highest predictor of the exhaustion variable (model 8) and a summary of the model in which we can see that the predictor variables Driver fatigue (DF8), Lack of energy (SOFI.1), Social Support (JCQ.SS), Psychophysiological disorders (Trans.1), Age, Physical exertion (SOFI.2), Significance (JDS.3) and Personal safety behaviors (Trans.2) account for 61.9 % of the criterion variable's variance. The Driver fatigue (DF8) variable stands out as the best predictor, accounting for 48.8 % of variance.

Among the most important aspects are the beta coefficient values. If we take a look at these coefficients we can see that the predictor variables that were found to be statistically significant were: Driver fatigue (β = 0.370), Lack of energy (β = 0.269), Social Support (β = -0.175), Psychophysiological disorders (β= .158), Age (β = -0.092), Physical exertion (β = 0.095), Significance (β = 0.059), and Personal safety behaviors (β = 0.062).

In Table 4 we can see the model that is the highest predictor of the variable Cynicism (model 12) and a summary of the model in which the predictor variables Lack of motivation (SOFI.4), Psychophysiological disorders (Trans.1), Job Control (JCQ.JC), Safety behaviors in the vehicle (Trans.3), Significance (JDS.3), Driver fatigue (DF8), Academic level, Social Support (JCQ.SS), ATRS.ATT, Conscientiousness (OP.CO, Emotional stability (OP.EE) and Job Demand (JCD-JD) account for 44.80 % of the criterion variable's variance. The Lack of motivation (SOFI.4) variable stands out as the best predictor, accounting for 42.15 % of variance. Among the most important aspects are the beta coefficient values. If we take a look at these coefficients we can see that the predictor variables that were found to be statistically significant were: Lack of motivation (β = 0.251), Psychophysiological disorders (β = 0.159), Job Control (β = -0.178), Safety behaviors in the vehicle (β = -0.124), Significance (β = -0.112), Driver fatigue (β = 0.160), Academic level (β = 0.105), Social Support (β = -0.115), ATRS.ATT (β = 0.070), Conscientiousness (β = -0.164), Emotional stability (β = 0.118) and Job Demand (β = 0.090).

In Table 5 we can see the model that is the highest predictor of the variable Professional efficiency (model 9) and a summary of the model in which the predictor variables Emotional stability (OP.EE), Job Control (JCQ.JC), ATRS.EFF, Conscientiousness (OP.CO), Seniority, feedback (JDS.5), Safety behaviors in the vehicle (Trans.3), Physical discomfort (SOFI.3) and Lack of energy (SOFI.1) account for 56.5 % of the criterion

variable's variance. The Emotional stability (OP.EE) variable stands out as the best predictor, accounting for 39.8 % of variance. Among the most important aspects are the beta coefficient values. If we take a look at these coefficients we can see that the predictor variables that were found to be statistically significant were: Emotional stability (β = 0.251), Job Control (β = 0.255), ATRS.EFF (β = 0.164), Conscientiousness (β = 0.172), Seniority (β = 0.110), feedback (β = 0.089), Safety behaviors in the vehicle (β = 0.090), Physical discomfort (β = -0.177) and Lack of energy (β = 0.138).

INSERT TABLE 3 HERE

INSERT TABLE 4 HERE

INSERT TABLE 5 HERE

4. Discussion

The results presented above are in line with the concept that certain variables related to personality and job characteristics have predictive power over burnout in professional drivers. The hypothesis is partially confirmed as we found that there are several factors that predict, both positively and negatively, burnout in professional drivers. These factors include Age, the older the driver the less emotional exhaustion, in accordance with research that indicates that the older the driver the less burnout they experience (64,65). The academic level positively predicts Cynicism, and Seniority positively predicts professional efficiency, in accordance with de Chávez Ramírez et al. (64). Fatigue measured with DF-8 positively influenced the Exhaustion factor and Cynicism. While the measures from the SOFI questionnaire indicated that Lack of energy influenced Exhaustion and professional Efficiency, Physical exertion influenced the exhaustion factor, Physical discomfort negatively

predicted professional efficiency and Lack of motivation positively predicted the Cynicism factor.

Regarding the work characteristics, we found that social support negatively predicts Exhaustion and Cynicism, Job demands positively predicts Cynicism, and Job control positively predicts Cynicism and professional efficiency. Significance positively predicts Exhaustion and negatively predicts Cynicism. Feedback received at work positively predicts Professional efficiency, which is in accordance with the findings of Ching-Fu and Yuan-Chun (66), who conclude that organizational support is negatively associated with emotional exhaustion.

Psychophysiological disorders positively predict Exhaustion and Cynicism. Personal safety behaviors that positively predict exhaustion and Safety behaviors in the vehicle negatively predict Cynicism and positively predict Professional efficiency. In addition, the personality variables that are shown as predictors in this research are Emotional stability, which positively predicts Cynicism and Professional efficiency, and Consciousness, which negatively predicts Cynicism and positively predicts Professional efficiency. Duarte and Pinto-Gouveia (67)conclude that psychological factors predict 29% of burnout in nurses. Bakker et al. (68)found that some personality factors moderate the relationship between negative experiences and burnout, and therefore these factors can help protect against the risks of developing burnout.

5. Conclusion

The results of this study provide relevant information for research into the factors that cause burnout in professional drivers. We determined the predictive capacity of certain variables that affect drivers and cause burnout. Exhaustion can be predicted with Fatigue (48.8%), Professional efficiency with Emotional Stability (39.8%) and Cynicism with Lack of motivation (28%) being the best predictors. The results contribute to a better knowledge of those factors that cause burnout in professional drivers.

The scales used allow prevention professionals to obtain data. This information may be used for a scientifically based evaluation. In addition, personality and fatigue measures provide information that can aid detection and help to manage and train these drivers. In conclusion, the results highlight the importance of designing individual interventions to reduce the incidence of burnout, which would help reduce sick leave and possible collisions, in addition to providing greater driver well-being.

6. Limitations of the study

This study is not without limitations. First, female representation is low because there are very few women who are professionally engaged in transportation. Furthermore, the data have been obtained through self-reports and this can produce biases that can range from social desirability to lack of sincerity. Finally, future research should consider the use of qualitative information collection strategies that would enable better understanding of the studied variables.

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Table 1

Descriptive statistics and reliability values with Cronbach's α coefficient.

Variable	Minimum	Maximum	Mean	*SD*	α
Exhaustion (MBI.E)	0	29	9.16	5.871	0.87
Cynicism (MBI.C)	0	24	6.23	4.781	0.83
Professional efficiency (MBI. PE)	0	36	27.56	6.132	0.78
Emotional Stability (OP.EE)	4	83	47.01	12.019	0.85
Conscientiousness (OP.CO)	12	76	49.12	12.028	0.78
Agreeableness (OP.AG)	16	81	50.06	11.527	0.72
Openness to experience (OP. OE)	11	69	42.71	10.332	0.80
Driver Fatigue (DF-8)	8	36	18.11	5.912	0.84
Lack of energy (SOFI.1)	0	30	11.24	7.024	0.86
Physical exertion (SOFI.2)	0	30	7.11	5.312	0.73
Physical discomfort (SOFI.3)	0	30	11.12	6.374	0.84
Lack of motivation (SOFI.4)	0	30	8.47	6.320	0.82
Sleepiness (SOFI.5)	0	30	11.02	7.112	0.89
Enforcement (ATRS.ENF)	5	35	22.12	6.208	0.84
General attitudes (ATRS.ATT)	4	28	14.33	6.222	0.88
Effectiveness (ATRS.EFF)	4	28	18.22	4.546	0.79
Variety (JDS.1)	3	21	10.83	40.220	0.79
Identity (JDS.2)	3	21	15.76	4.351	0.78
Significance (JDS.3)	4	21	14.62	3.834	0.72
Autonomy (JDS.4)	3	21	14.01	4.547	0.75
Feedback (JDS.5)	5	21	16.17	3.442	0.72
Agents (JDS.6)	3	21	10.29	4.213	0.73
Dealing with others (JDS.7)	3	21	12.99	4.009	0.71
Social Support (JCQ.SS)	10	40	27.14	5.998	0.87
Job Demand (JCQ-JD)	8	32	20.12	3.423	0.75
Job Control (JCQ.JC)	7	28	18.03	4.552	0.76
Extraversion (OP. EX)	18	74	42.38	9.767	0.84
Psychophysiological disorders (Trans.1)	6	30	11.62	4.42	0.82
Personal safety behaviors (Trans.2)	6	30	20.69	5.59	0.73
Safety behaviors in the vehicle (Trans.3)	6	30	23.95	4.98	0.75

Note: MBI.E = Exhaustion; MBI.C = Cynicism; MBI. PE = Professional efficiency; OP.EE = Emotional Stability; OP.CO = Conscientiousness; OP.AG = Agreeableness; OP. OE = Openness to experience; DF-8 = Driver Fatigue; SOFI.1 = Lack of energy; SOFI.2 = Physical exertion; SOFI.3 = Physical discomfort; SOFI.4 = Lack of motivation; SOFI.5 = Sleepiness; ATRS.ENF = Enforcement; ATRS.ATT = General attitudes; ATRS.EFF = Effectiveness; JDS.1 = Variety; JDS.2 = Identity; JDS.3 = Significance; JDS.4 = Autonomy; JDS.5 = Feedback; JDS.6 = Agents; JDS.7 = Dealing with others; JCQ.SS = Social Support; JCQ-JD = Job Demand; JCQ.JC = Job Control; OP. EX = Extraversion; Trans.1 = Psychophysiological disorders; Trans.2 = Personal safety behaviors; Trans.3 = Safety behaviors in the vehicle.

581 **Table 2**

582 *Correlations between the predictor variables and the criterion variables (Burnout).*

PREDICTOR VARIABLE	CRITERION VARIABLE		
	Exhaustion	**Cynicism**	**Professional efficiency**
Age	**-0.168****	**-0.167****	**0.332****
Academic Level,	-0.024	0.060	**0.117****
Seniority	-0.042	-0.020	**0.217****
Hours worked per week	0.007	**-0.120****	**0.299****
Enforcement (ATRS.ENF)	**-0.139****	**-0.204****	**0.413****
General attitudes (ATRS.ATT)	**0.136****	**0.109***	**0.131****
Effectiveness (ATRS.EFF)	-0.015	**-0.125****	**0.478****
Variety (JDS.1)	**-0.181****	**-0.287****	**0.207****
Identity (JDS.2)	**-0.138****	**-0.124****	**0.253****
Significance (JDS.3)	-0.057	**-0.257****	**0.292****
Autonomy (JDS.4)	**-0.153****	**-0.155****	**0.235****
Feedback (JDS.5)	**-0.089***	**-0.168****	**0.312****
Agents (JDS.6)	-0.028	-0.059	0.056
Dealing with others (JDS.7)	**-0.122****	**-0.171****	**0.163****
Social Support (JCQ.SS)	**-0.216****	**-0.266****	**0.356****
Job Demand (JCQ.JD)	**0.131****	-0.003	**0.426****
Job Control (JCQ.JC)	**-0.188****	**-0.303****	**0.506****
Lack of energy (SOFI.1)	**0.688****	**0.480****	**-0.096***
Physical exertion (SOFI.2)	**0.527****	**0.420****	**-0.163****
Physical discomfort (SOFI.3)	**0.621****	**0.434****	**-0.147****
Lack of motivation (SOFI.4)	**0.585****	**0.530****	**-0.171****
Sleepiness (SOFI.5)	**0.561****	**0.397****	**-0.101***
Driver Fatigue (DF-8)	**0.699****	**0.481****	**-0.141****
Extraversion (OP. EX)	**-0.126****	**-0.176****	**0.264****
Emotional Stability (OP.EE)	**-0.177****	**-0.202****	**0.631****
Responsibility (OP.CO)	**-0.110***	**-0.244****	**0.575****
Agreeableness (OP. Ag)	**-0.135****	**-0.205****	**0.380****
Openness to experience (OP. OE)	**-0.198****	**-0.151****	0.074
Psychophysiological disorders (Trans.1)	**0.566****	**0.438****	**-0.150****
Personal safety behaviors (Trans.2)	**-0.088***	**-0.133****	**0.317****
Safety behaviors in the vehicle (Trans.3)	**-0.249****	**-0.309****	**0.486****

**. The correlation is significant at the 0.01 level (bilateral).
*. The correlation is significant at the 0.05 level (bilateral).

583 Note: ATRS.ENF = Enforcement; ATRS.ATT = General attitudes; ATRS.EFF = Effectiveness; JDS.1 =
584 Variety; JDS.2 = Identity; JDS.3 = Significance; JDS.4 = Autonomy; JDS.5 = Feedback; JDS.6 = Agents; JDS.7
585 = Dealing with others; JCQ.SS = Social Support; JCQ-JD = Job Demand; JCQ.JC = Job Control; SOFI.1 = Lack
586 of energy; SOFI.2 = Physical exertion; SOFI.3 = Physical discomfort; SOFI.4 = Lack of motivation; SOFI.5 =
587 Sleepiness; DF-8 = Driver Fatigue; OP. EX = Extraversion; OP.EE = Emotional Stability; OP.CO =

588 Conscientiousness; OP.AG = Agreeableness; OP. OE = Openness to experience; Trans.1 = Psychophysiological
589 disorders; Trans.2 = Personal safety behaviors; Trans.3 = Safety behaviors in the vehicle.

590

591 **Table 3**

592 *Summary of the models, variables and coefficients of the regression analysis (stepwise method)*

593 *for Exhaustion (MBI-GS)*

Model and Variable	Models						Coefficient				
	R	R^2	R2 Adjusted	R Change	F Change	sig	B	SE	β	t	sig
Model-1	0.699	0.489	0.488	0.489	492.091	0.000					
Model-2	0.751	0.564	0.562	0.075	87.991	0.000					
Model-3	0.770	0.593	0.591	0.029	36.449	0.000					
Model-4	0.779	0.607	0.604	0.014	18.027	0.000					
Model-5	0.783	0.614	0.610	0.007	8.981	0.003					
Model-6	0.786	0.617	0.613	0.004	4.907	0.027					
Model-7	0.788	0.621	0.616	0.004	5.648	0.018					
Model-8	0.790	0.625	0.619	0.003	4.205	0.041					
DF-8							0.377	0.043	0.370	8.777	0.000
Lack of energy (SOFI.1)							0.226	0.035	0.269	6.464	0.000
Social Support (JCQ.SS)							-0.172	0.028	-0.175	-6.068	0.000
Psychophysiological disorders (Trans1)							0.211	0.049	0.158	4.314	0.000
Age							-0.041	0.013	-0.092	-3.258	0.001
Physical exertion (SOFI.2)							0.106	0.039	0.095	2.679	0.008
Significance (JDS.3)							0.089	0.043	0.059	2.079	0.038
Personal safety behaviors (Trans2)							0.031	0.015	0.062	2.051	0.041

Excluded variables: ATRS.ENF, ATRS.ATT, ATRS.EFF, Variety (JDS.1), Identity (JDS.2), Autonomy (JDS.4), Feedback (JDS.5), Agents (JDS.6), Dealing with others (JDS.7), Job Demand (JCQ-JD), Job Control (JCQ.JC), Safety behaviors in the vehicle (Trans.3), Physical discomfort (SOFI.3), Lack of motivation (SOFI.4), Sleepiness (SOFI.5), Extraversion (OP.EX), Emotional Stability (OP.EE), Responsibility (OP.CO), Agreeableness (OP.Ag), Openness to experience (OP.OE), Academic Level, Seniority and Hours worked per week.

594

595 **Table 4**

596 *Summary of the models, variables and coefficients of the regression analysis (stepwise method)*

597 *for Cynicism (MBI-GS).*

Model and Variable	Model						Coefficient				
	R	R^2	R2 Adjusted	R Change	F Change	sig	B	SE	β	t	sig
Model-1	0.530	0.281	0.280	4.215	201.164	0.000					
Model-2	0.576	0.331	0.329	4.069	38.404	0.000					
Model-3	0.616	0.379	0.376	3.924	39.563	0.000					
Model-4	0.630	0.397	0.393	3.871	15.196	0.000					
Model-5	0.640	0.409	0.404	3.835	10.542	0.001					
Model-6	0.649	0.422	0.415	3.799	10.843	0.001					
Model-7	0.656	0.431	0.423	3.779	8.150	0.004					
Model-8	0.663	0.439	0.430	3.749	7.386	0.007					
Model-9	0.667	0.445	0.435	3.732	5.707	0.017					
Model-10	0.671	0.450	0.439	3.720	4.273	0.039					
Model-11	0.676	0.457	0.445	3.700	6.458	0.011					
Model-12	0.679	0.461	0.448	3.689	3.954	0.047					
Lack of motivation (SOFI.4)							0.198	0.034	0.251	5.893	0.000
Psychophysiological disorders (Trans.1)							0.178	0.048	0.159	3.721	0.000
Job Control (JCQ.JC)							-0.191	0.046	-0.178	-4.183	0.000
CS.Vehicle (Trans.3)							-0.124	0.041	-0.124	-3.029	0.003
Significance (JDS.3)							-0.142	0.045	-0.112	-3.163	0.002
Driver Fatigue (DF-8)							0.137	0.041	0.160	3.389	0.001
Academic Level							0.584	0.189	0.105	3.089	0.002
Social Support (JCQ.SS)							-0.095	0.033	-0.115	-2.926	0.004
General attitudes (ATRS.ATT)							0.056	0.028	0.070	1.990	0.047
Conscientiousness (OP.CO)							-0.068	0.020	-0.164	-3.402	0.001
Emotional Stability (OP.EE)							0.043	0.019	0.118	2.223	0.027
Job Demand (JCQ-JD)							0.126	0.063	0.090	1.989	0.047

Excluded variables: ATRS.ENF, ATRS.EFF, Variety (JDS.1), Identity (JDS.2), Autonomy (JDS.4), Feedback (JDS.5), Agents (JDS.6), Dealing with others (JDS.7), Job Demand (JCQ-JD), trans.2.CS.Personal, Lack of energy (SOFI.1), Physical exertion (SOFI.2), Physical discomfort (SOFI.3), Sleepiness (SOFI.5), Extraversion (OP.EX), and Agreeableness (OP.Ag), Openness to experience (OP.OE), Seniority and Hours worked per week.

598

599 **Table 5**

600 *Summary of the models, variables and coefficients of the regression analysis (stepwise method)*

601 *for Professional efficiency (MBI-GS).*

Model and Variable	Model						Coefficient				
	R	R^2	R2 Adjusted	R Change	F Change	sig	B	SE	β	t	sig
Model-1	0.631	0.399	0.398	4.942	0.399	0.000					
Model-2	0.690	0.476	0.474	4.616	0.078	0.000					
Model-3	0.717	0.514	0.511	4.453	0.037	0.000					
Model-4	0.729	0.532	0.528	4.375	0.018	0.000					
Model-5	0.738	0.545	0.541	4.316	0.014	0.000					
Model-6	0.746	0.556	0.551	4.268	0.011	0.000					
Model-7	0.750	0.562	0.556	4.241	0.007	0.006					
Model-8	0.753	0.566	0.560	4.226	0.004	0.031					
Model-9	0.757	0.572	0.565	4.200	0.006	0.008					
Emotional Stability (OP.EE)							0.116	0.021	0.251	5.436	0.000
Job Control (JCQ.JC)							0.350	0.045	0.255	7.768	0.000
Effectiveness (ATRS.EFF)							0.224	0.048	0.164	4.697	0.000
Conscientiousness (OP.CO)							0.091	0.023	0.172	4.042	0.000
Seniority							0.005	0.001	0.110	3.726	0.000
Feedback (JDS.5)							0.168	0.058	0.089	2.881	0.004
CS.Vehicle (Trans.3)							0.115	0.046	0.090	2.483	0.013
Physical discomfort (SOFI.3)							-0.162	0.047	-0.177	-3.432	0.001
Lack of energy (SOFI.1)							0.125	0.047	0.138	2.661	0.008

Excluded variables: ATRS.ENF, ATRS.ATT, Variety (JDS.1), Identity (JDS.2), Significance (JDS.3), Autonomy (JDS.4), Agents (JDS.6), Dealing (JDS.7), Social Support (JCQ.SS), Job Demand (JCQ-JD),Tr. Psychophysiological disorders (Trans.1), CS.Personal (Trans.2), Physical exertion (SOFI.2), Lack of motivation (SOFI.4), Sleepiness (SOFI.5), Extraversion (OP.EX), Agreeableness (OP.Ag), Openness to experience (OP.OE), DF.8, Academic Level and Hours worked per week.

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Table 6

Summary of the predictive models for the criterion variables.

PREDICTOR VARIABLE	Factor 1 *Exhaustion*		Factor 2 *Cynicism*		Factor 3 *Professional efficiency*	
	ΔR^2 Correct.	β	ΔR^2 Correct.	β	ΔR^2 Correct.	β
Age	0.006	-0.092				
Academic Lebel			0.008	0.105		
Seniority					0.013	0.110
DF-8	**0.488**	0.370	0.011	0.160		
Lack of energy (SOFI.1)	0.074	0.269			0.005	0.138
Physical exertion (SOFI.2)	0.003	0.095				
Physical discomfort (SOFI.3)					0.004	-0.177
Lack of motivation (SOFI.4)			**0.280**	0.251		
Social Support (JCQ.SS)	0.029	-0.175	0.007	-0.115		
Job demand (JCQ.JD)			0.003	0.090		
Job Control (JCQ.JC)			0.047	-0.178	0.076	0.255
Psychophysiological disorders (Trans.1)	0.013	0.158	0.049	0.159		
Personal safety behaviors (Trans.2)	0.003	0.062				
Safety behaviors in the vehicle (Trans.3)			0.017	-0.124	0.005	0.090
Significance (JDS.3)	0.003	0.059	0.011	-0.112		
Feedback (JDS.5)					0.010	0.089
General attitudes (ATRS.ATT)			0.005	0.070		
Effectiveness (ATRS.EFF)					0.037	0.164
Emotional Stability (OP.EE)			0.006	0.118	**0.398**	0.251
Conscientiousness (OP.CO)			0.004	-0.164	0.017	0.172
Total explained variance (%)	61.90		44.80		56.45	

Note: DF-8 = Driver Fatigue; SOFI.1 = Lack of energy; SOFI.2 = Physical exertion; SOFI.3 = Physical discomfort; SOFI.4 = Lack of motivation; JCQ.SS = Social Support; JCQ-JD = Job Demand; JCQ.JC = Job Control; Trans.1 = Psychophysiological disorders; Trans.2 = Personal safety behaviors; Trans.3 = Safety behaviors in the vehicle; JDS.3 = Significance; JDS.5 = Feedback; ATRS.ATT = General attitudes; ATRS.EFF = Effectiveness; OP.EE = Emotional Stability; OP.CO = Conscientiousness.

Figure 1

Model followed in this research