

Gender differences in teachers' occupational accidents

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Abstract:

The authors stated that the main objective of the current research is to analyze the relationship between the gender of injured teachers and independent variables, such as age, place of the accident, absence days, and severity of the injury, to improve women's occupational health and safety. Teachers' accidents recorded in Spain (N= 136,702) from 2003 through 2018 were analyzed by calculating their incidence rates, using statistical tools for independent samples. Gender differences were found in some of the variables studied. Women were more likely to suffer an occupational accident. Compensation per lost working day was found to be statistically lower for women, but no differences based on gender were found in the absence days due to occupational accidents suffered by teachers. The salary gap should be addressed to avoid gender economic discrimination among injured teachers. Preventive strategies should be developed to mitigate the negative difference caused by gender variables.

Keywords: accident, teacher, injury, severity, gender

Human and economic costs of occupational accidents are a worldwide cause of concern (Shalini, 2009), and women represented around 38% of the worldwide labor force exposed in the last decade (World Bank, 2020). Health care of women in the workplace is not a new issue (Collins, 1990); although some interventions and preventive measures have been tested (Akyurek et al., 2020; Shin, 2020), further improvements are needed for women's occupational health and safety (OHS).

Accident research used to be focused on traditionally hazardous sectors like construction (López-Arquillos et al., 2015) or mining (Sanmiquel et al., 2015) with particularly low participation rates for women. However, other occupations, with lower severity levels in their occupational accidents, experienced a high number of losses due to their high number of employees. Some of these occupations presented high participation rates for women. The teaching profession is one of the more extended throughout the world (UNESCO, 2016). In 2018, a total of 874,998 non-university teachers were working in Spain. They represented 4.38% of the employed population of the country (Ministerio de Educación y Formación Profesional, 2019). In the cited report, women represented 66.6% of the teachers at schools and high schools.

Several authors have studied gender differences between teachers in the workplace. For instance, poor sleep quality and higher levels of diurnal sleepiness due to the combination of professional demands and domestic tasks were detected in a study carried out in Brazil (de Souza et al., 2018). Related to job satisfaction, female university teachers in the United States and the United Kingdom were more satisfied with their jobs than male academics of comparable ranks (Okpara et al., 2005; Oshagbemi, 2000). Similar results of satisfaction level among female teachers were found in other educational levels (Şahin & Sak, 2016). These results could be explained because females

reported higher emotional intelligence (Anari, 2012), although they had greater workload stress (Klassen & Chiu, 2010). In contrast, other authors did not find gender differences associated with job satisfaction (Menon & Athanasoula-Reppa, 2011).

In terms of occupational health, teachers perform their daily job in a complex environment where many different factors might lead to poor psychological health, such as high levels of burnout and depression (Capone et al., 2019). Some authors have concluded that female teachers are more susceptible to burnout than males (Ahola et al., 2014). However, health problems are not limited to depression. Previous authors have found that female teachers are more likely to suffer dysphonia (Hunter & Banks, 2017), dermatitis, and varicose veins (Kovess-Masféty et al., 2006), while no significant difference was found for chronic pain between male and female teachers (Kovess-Masféty et al., 2006).

Although some authors have studied occupational accidents among different categories of teachers (Erick & Smith, 2011; Goossens et al., 2019; Pirbalouti et al., 2017; Suárez-Cebador et al., 2015; Wu et al., 2019), there is a lack of research focused on the relationship between gender and teachers' accidents. However, the influence of gender in occupational accident rates, which happened in different sectors, has been demonstrated by previous authors (Herrero et al., 2012). While men showed worse accident rates (Łyszczarz & Nojszewska, 2018; Salminen, 2004; Turkkan & Pala, 2016), lost working days among women are frequently longer (Cheadle et al., 1994; Fontaneda et al., 2019; González-Ramírez et al., 2017). In order to compare previous results with teachers' accidents, it is necessary to develop research focused on gender influence in teachers' occupational accidents.

Aim

Based on the previous work analyzed, we concluded that the main objective of the current research is to analyze the relationship between the gender of injured teachers and independent variables, such as age, place of the accident, absence days, and severity of the injury, to improve women's OHS.

Methodology

Data collection

According to the Spanish legal framework, occupational accidents should be reported to the government using an official accident report. Every occupational accident report should be submitted through an electronic platform called Delt@ system. The report includes 57 variables, including age, gender, severity, place of the accident, length of service, company size, absence days, and part of the body injured.

The Spanish Ministry of Labor and Social Economy supplied the total number of occupational accidents reported from 2003 to 2018. Only accidents suffered by teachers were selected according to their national occupation code (CN0), and the rest of the accidents suffered by workers from other occupations were removed from the current research. Finally, 136,702 occupational accidents suffered by teachers were analyzed.

Statistical analysis

To better understand the distribution of accidents, a descriptive analysis was conducted focused on gender differences. The percentage of female teachers employed and the percentage of women among injured teachers were calculated. Then, incidence rates per 1,000 workers were analyzed, and fatal incidence rates were obtained per male and female teachers. After the descriptive analysis, statistical inference was carried out focused on

gender variables using the t-student test for independent samples of accidents. Statistical software SPSS v23 was used to obtain the results.

Results

The total number of female teachers is higher than that of male teachers (Fig. 1) (Ministerio de Educación y Formación Profesional, 2019).

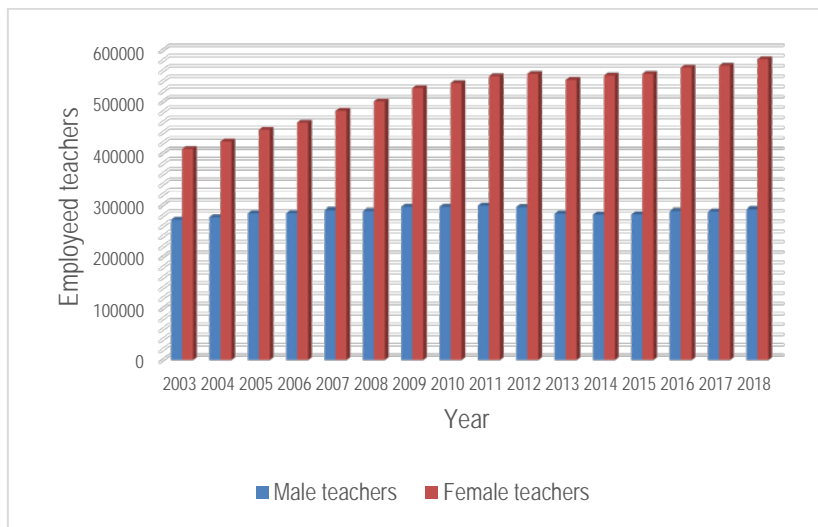


Figure 1. Distribution of employed teachers by gender and year

In accordance, the percentage of women in the group of injured teachers is higher when compared with males teachers (Fig. 2); however, the percentage of women injured is higher than the percentage of women employed (Fig. 3), and this difference has been increasing in recent years.

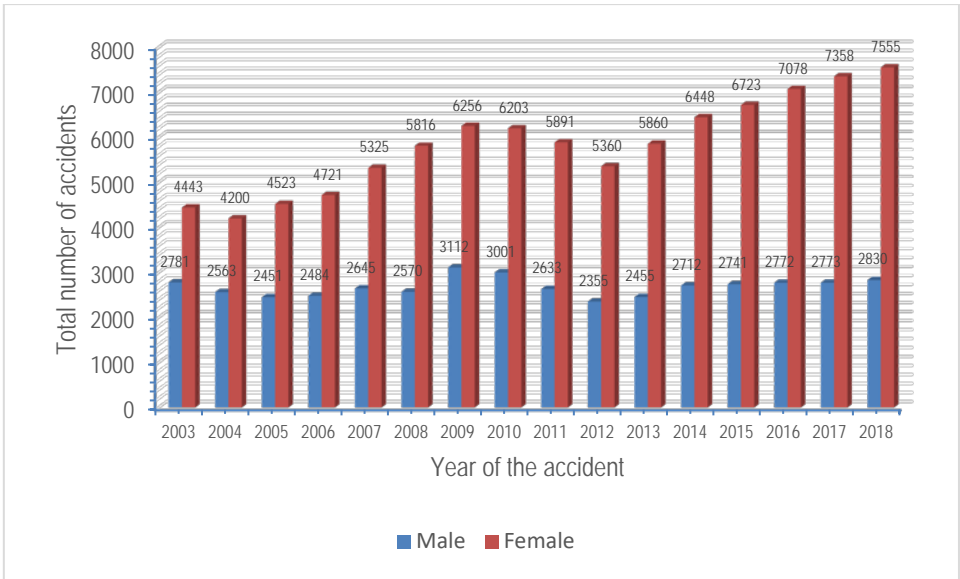


Figure 2. Distribution of occupational accidents by gender and year

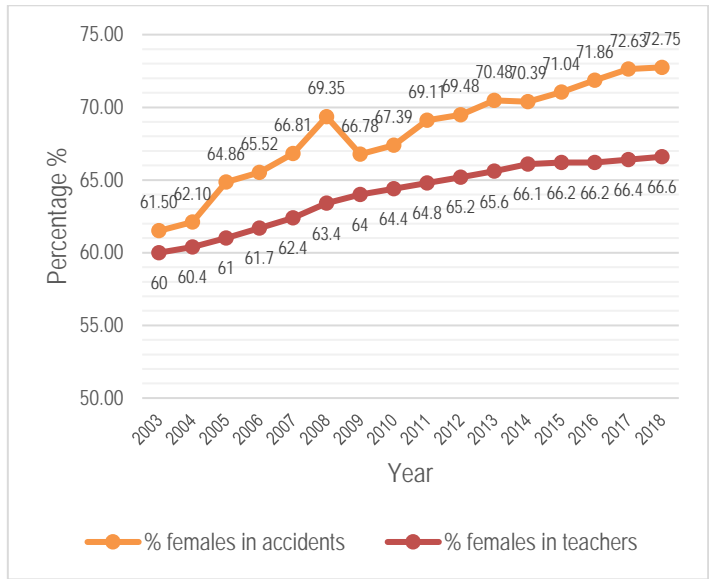


Figure 3. Percentage of females among teachers employed and teachers' accidents

According to data supplied and official statistics of employed teachers (Ministerio de Educación y Formación Profesional, 2019), incidence rates and fatal incidence rates were calculated. In the case of incidence rates per 1,000 workers, although male and

female rates increase or decrease at the same time following similar trends for the majority of years analyzed (Fig. 4), female teachers showed higher values when compared with men.

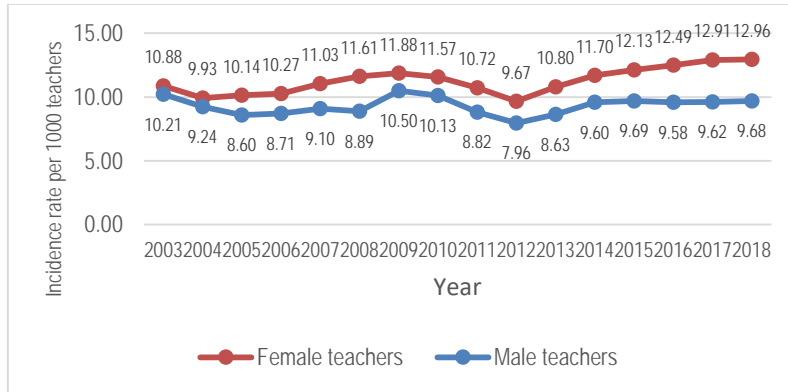


Figure 4. Incidence rates by gender

In addition, women's rates increased year by year since 2012, and the difference between genders tends to increase year by year, as can be observed in Figure 5.

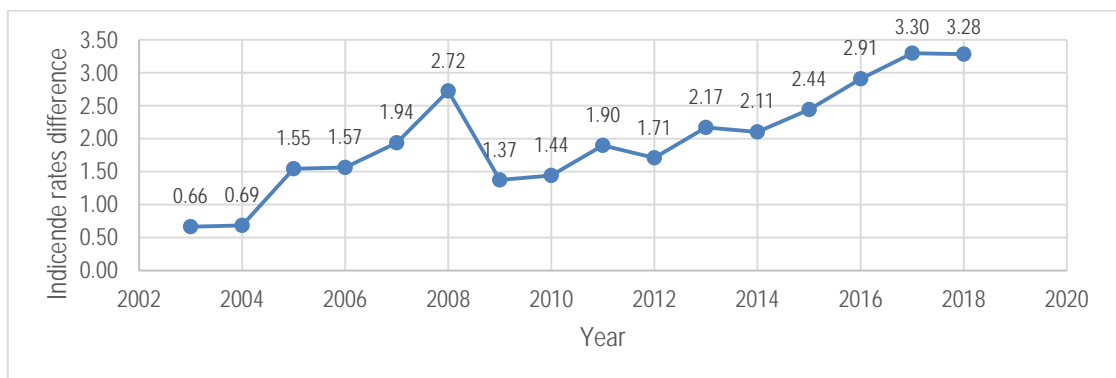


Figure 5. Gender difference in incidence rates

Fatal accidents showed more variable trends due to the low number of fatalities per year in the sector, although in the majority of the year men showed worse results in

terms of fatality rates. More than 40% of the fatalities were linked to a traffic accident, where male teachers represented 53.7% of the traffic deaths, even though they represented only 36% of the employed teachers.

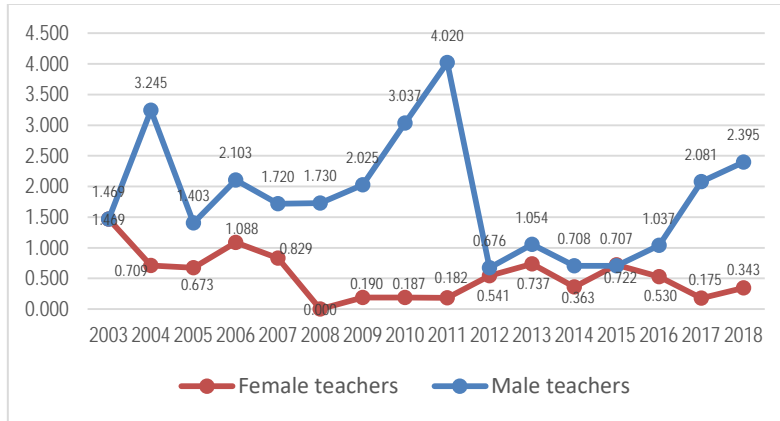


Figure 6. Fatal incidence rates by gender

Part of the body of injured	Men		Women	
	Number	Percentage	Number	Percentage
Neck	4080	21,4%	14970	78,6%
Back	5552	31,0%	12355	69,0%
Trunk	1717	38,9%	2696	61,1%
Upper extremity	10956	34,6%	20701	65,4%
Lower extremity	15979	32,3%	33529	67,7%
Mulltiple parts	2180	28,5%	5463	71,5%
No information	2414	37,0%	4110	63,0%
Total	42878		93824	

Table 1. Distribution of accidents based on part of the body injured and gender

The distribution of teachers' occupational accidents based on part of the body injured and gender (Table 1) reveals that neck injuries were more often found in women, while trunk injuries were more frequently associated with men.

After the descriptive analysis, the Kolmogorov–Smirnov test was carried out to ensure the normal distribution of the sample in the selected variables of age, length of

service, absence days, hour of the accident, and compensation. Results from the test proved the normal distribution of the sample. Then, a t-student test was carried out. The average, standard deviation, and t-student test for the different variables studied are reported in Table 2. The average age of injured women was 41.4 years, while the same category of men was lower (39.3), and the t-test confirmed that this difference in the distribution of age of injured workers by gender was statistically significant (p-value<0.001). Similarly, the length of service of injured teachers showed significant differences between women and men. In the cited variable, the average of women's experience (80.7 months) was higher than the average length of service in the group of men (74.6 months). Another remarkable result was the difference between men and women in the economic daily compensation per day of absence after an occupational accident (men= 35.56; women = 34.86; p value<0.001). In contrast, the hour of the accident (p value=0.853) and absence days (p value=0.325) followed the same distribution between men and women without significant statistical differences.

Variable	Average		Standard deviation		t-student test		
	Men	Women	Men	Women	Sig. (bilateral)	Lower	Upper
Age	39,3	41,4	12,015	11,941	0,000	-2,271	-1,998
Lenght of service (months)	74,6	80,7	96,8	104,9	0,000	-7,215	-4,873
Absence days	27,94	27,98	43,22	41,43	0,853	-0,045	0,245
Hour of the accident	11,57	11,55	0,32	0,31	0,325	-0,031	0,093
Compensation per day	35,56	34,86	0,16046	0,1629	0,000	0,3843	1,01338

Table 2. T-student results based on gender

Discussion

The authors observed that a higher presence of women in the education sector lead to a higher number of women in the group of injured teachers; however, their incidence

rate per 1,000 occupied workers was higher too. Although other authors found men's accident rate to be higher (Salminen, 2004), the study was not focused on teachers only. The results obtained are consistent because women teachers reported greater workload stress (Klassen & Chiu, 2010), and this workplace factor is associated with occupational accidents (Herrero et al., 2012). Remarkably, women's incidence rates grew in the last four years studied, while men's rates were close to the same value during the same period. In contrast, when only fatal accidents were considered, men showed the worst results. These results can be due to the fact that 40% of fatal accidents were traffic accidents, and men's rates are traditionally higher in this category of accidents (Al-Balbissi, 2003; Fort et al., 2010).

The average of absence days due to an occupational accident was found to be statistically similar for men and women. Although other studies concluded that the number of lost working days due to an occupational accident is statistically lower for men than women (Cheadle et al., 1994; Cocker et al., 2018; Fontaneda et al., 2019), these studies were not focused on teachers; several occupations were compared, and the differences found could be due to this fact. The time of the accident showed no differences by gender, with both genders following the same distribution pattern throughout the day. This result is consistent with the result obtained for absence days because previous authors pointed out the relation between the seriousness of the accident and the hour of the day (Camino López et al., 2011; Fontaneda et al., 2019).

Another remarkable finding was the difference in the average age of injured teachers. Injured women were older and had longer length of service than men when their average ages were compared. Age variation could be one of the reasons for the different distribution of accidents according to the part of the body injured because some authors

highlighted that the type of occupational accident can change with age (Altunkaynak, 2018; Chau et al., 2010).

Finally, compensation per lost working day was found to be statistically lower for women. The main reason for this finding is the lower salary received by female teachers because the amount of compensation is calculated according to the worker's salary. The gender salary gap in the education sector is not a new problem (Barbezat & Hughes, 2005), and the issue is not yet solved (Fox et al., 2019; Webber & Canché, 2015).

Conclusions

Gender differences were found by the researchers in some of the variables studied. Women were more likely to suffer an occupational accident, while men were more likely to suffer a fatal accident. Injured women showed a higher age and length of service, although the average number of working days lost did not show significant differences between men and women. It should be highlighted that compensation per working day lost in women was lower than men's compensation. The salary gap should be addressed to avoid gender economic discrimination among injured teachers. Fatal accidents were linked to traffic accidents for both genders. Specific preventive measures should be developed to address the problem of traffic accidents among teachers.

The research highlighted the main differences between female teachers' occupational accidents and male teachers' occupational accidents. The differences found are important to design and promote specific health and safety programs in the workplaces adapted to women's needs. Although the data studied are relevant only to one country, the research can be replicated elsewhere with a variety of occupations with a high rate of participation by women.

Limitation of the study

Although the sample size was enough for statistical significance of the results, only accidents officially notified were analyzed, and circumstances of the unreported accidents in the workplace were not included in the current research.

Future research

Preventive strategies should be developed to mitigate the negative difference caused by gender variables. In addition, the effectiveness of the proposed measures should be studied in future research. The research could be replicated in other countries with other occupations.

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