safety

MDPI

Communication

Influence Variables in Occupational Injuries among Men Teachers

María del Carmen Rey-Merchán [1,†] and Antonio López-Arquillos [2,*,†,‡]

[1] Consejería de Educacion y Deporte, 41018 Sevilla, Spain; mmccrrmm@gmail.com
[2] Departamento de Economía y Administración de Empresas, Universidad de Málaga, 29016 Málaga, Spain
* Correspondence: alopezarquillos@uma.es
† These authors contributed equally to this work.
‡ Current address: Departamento de Economía y Administración de Empresas, Escuela de Ingenierías Industriales, Universidad de Málaga, 29016 Málaga, Spain.

Abstract: Background: Occupational accidents suffered by male teachers can be a source of injury to different parts of the body and can lead to absence from work. However, there are only a limited number of studies focused on this topic; the current research evaluates the influence of the main variables associated with occupational injuries among male teachers. Methods: Logistic regression based on the calculation of the odds ratio (OR) was used on a sample of 42,878 occupational accidents suffered by male teachers in the period 2003–2018. Results: Male teachers under 45 years of age with less than one year of experience obtained better results for most types of injury. In contrast, those older than 45 years and with more experience obtained worse results. Conclusions: No single variable was detected with the same protective or risk effect through the different parts of the body injured. Teachers' safety training adapted to risk profiles and injuries could improve accident rates in the education sector.

Keywords: injury; occupational; teacher; accident; safety; neck; back; pain; MSD

Citation: Rey-Merchán, M.d.C.; López-Arquillos, A. Influence Variables in Occupational Injuries among Men Teachers. *Safety* **2022**, *8*, 51. https://doi.org/10.3390/safety8030051

Academic Editor: Raphael Grzebieta

Received: 23 May 2022
Accepted: 11 July 2022
Published: 14 July 2022

1. Introduction

Accidents at work are associated with negative consequences for workers, organizations, and society [1]. Occupational injuries as a result of a accidents are a common cause of absence from work and early retirement [2–4]. Occupational accident risk is affected by work tasks, and in some occupations like teaching, repetitive movements or continuously looking down when reading or writing are a common source of pain and injury [5]. With the aim of improving occupational safety levels among teachers, several authors have studied teacher's injuries focused on musculoskeletal disorders (MSD) [6–9] and the influence of psychosocial factors in injuries [10,11].

Most studies in the literature can be classified in the following categories:

- Specialization of the teacher (physical education, musicians, or special education)
- Part of the body affected (neck, back, upper extremities, etc.)

In the first category, cross-sectional, country-specific studies, such as one for Slovenia [12], were carried out to analyse occupational injuries among, in the cited study for example, physical education teachers. A similar approach was performed in other countries such as Canada, Belgium, the Netherlands or Germany [13–16]. Other authors [17–19] have focused on music teachers and found that awkward posture and the many hours spent playing an instrument can contribute to injury. In the second category, some authors have studied, specifically, lower back pain [20–22], shoulder and neck pain [23,24], or lower extremities injuries [25] among teachers.

Although female and male teachers are both exposed to similar risks, differences between the incidence rates and consequences of the occupational accidents suffered by

men have been identified in previous research [26–28]. Some authors found a significant prevalence of MSD among female teachers [6], while other authors concluded that compensation per lost working day was higher for male teachers [26]. In addition, while female teachers presented a higher prevalence of injury [29], male teachers presented higher severity rates [26]. The specific study of injuries among male teachers, previously identified as an at-risk population, is significant to promote specific solutions for this group of workers.

Some limitations were found in the existing literature. The source of the data is one of the main limitations found in the design of the studies reviewed. On the one hand, some studies used occupational health and safety questionnaires [25], or collected opinions from experts through the creation of expert panels [19]. The origin of the data tended to be restricted to a single or limited number of schools. On the other hand, other studies were based on accident data, but the total amount of accidents analysed was limited to a local sample [14,30].

In addition, the number of studies focused on occupational accidents recorded in the education sector is low compared to other sectors such as the construction or manufacturing industry. Although the severity of the accidents in the education sector tends to be lower than in more hazardous sectors, the high number of teachers motivates great losses because of days absent, early retirement and compensations [31]. Currently, the number of teachers employed worldwide is estimated to be around 90 million [32].

According to the existing background, occupational injuries among teachers have been identified as an under-researched topic [6], as a consequence, specific studies focused on accidents suffered by the male teachers are necessary.

The objective of the current research is to evaluate the influence of the main variables associated with occupational injuries suffered by this population.

The remainder of the paper is structured as follows: Section 1 described the relevant literature regarding occupational injuries among teachers. In Section 2, we describe the data analyzed and the statistical analysis was performed. Section 3 presents the results calculated and discusses them. In Section 4, conclusions are highlighted.

2. Methodology

A summary of the methodological phases of the research is depicted in Figure 1.

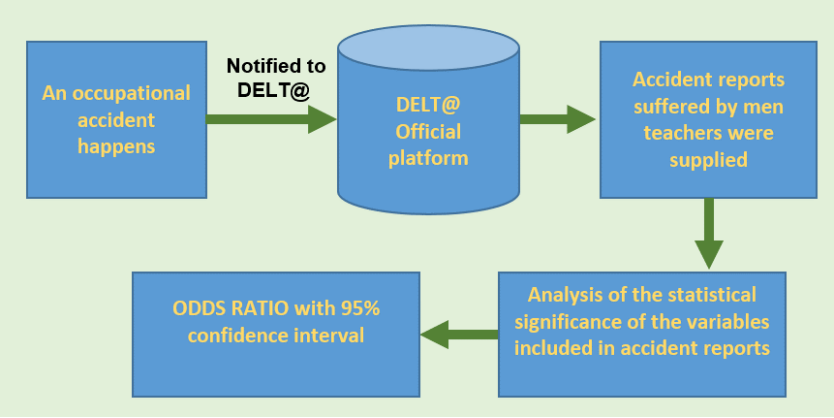

Figure 1. Description of the methodological phases.

In Spain, all occupational accidents resulting in one or more day of absence should lead to electronic notification of the Labour Authority through the Delt@ platform. The platform collects all the official occupational accident reports daily communicated by the employers of the worker injured. For the current study, the Spanish Government provided 42,878 occupational accidents corresponding to all occupational accidents reported by male teachers in Spain from 2003 until 2018. Figure 2 depicts the total number of occupational accidents (Blue) and the incidence rates for male teachers (Orange) in the period analysed. The trend over the last five years appears to be quite stable.

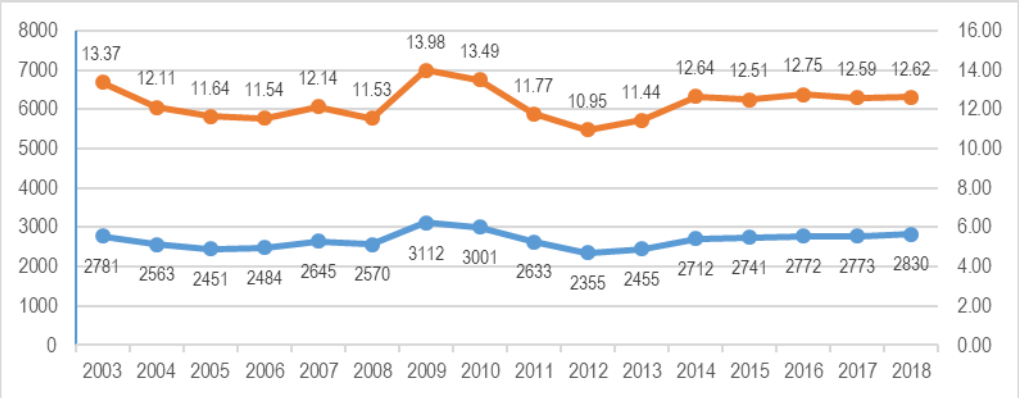

Figure 2. Incidence rate and total accidents recorded by men teachers from 2003 until 2018.

Official accident reports included 58 different variables. Some of them were considered to be personal variables based on the worker injured (age, gender, nationality, duration of service), while some variables described characteristics of the organization where the accident took place (sector, OHS organization, company size), and others provided information about the circumstances of the accident (day of the week, part of the body injured, deviation). The variable for the part of the body injured was selected as the main variable for analysis to measure the impact of crashes in worker anatomy, and accidents were grouped according to the part of the body affected. The remaining variables were then analysed. Based on the statistical significance of the variables, the following eight variables were selected:

- Age: Provides the of the worker injured.
- Nationality: Supplies the nationality of the worker injured.
- Length: Lenght of service in the organization.
- Temporal: Type of contract.
- Public. Category of the workplace as Public or Private.
- Traffic: If the accident was associated with a crash or not.
- Monday: Describes if the accident was occurred on Monday or not.
- Severity: Describes the consequence of the accident in the worker in two groups: Ligth, or rest (serious, very serious and Fatal).

For the statistical analysis, odds ratio values were calculated based on a logistic regression model [33]. The logistic regression model provides the OR of suffering an injury among those individuals who have suffered an exposure to a variable (XE) with respect to individuals who have not suffered exposure to the same variable, adjusted by a set of characteristics (X1, . . . , Xk). The model uses the logit transformation (natural logarithm of the odds) to prevent the obtained function from taking negative values. The relationship between the part of the body injured and the rest of the variables studied was analysed using an adjusted OR with a confidence interval (CI) of 95%. The main advantage of the method is that it is well-known, easy to apply and evaluate with any statistical package and, furthermore, it has good statistical properties.

3. Results and Discussion

In the current section, results are described and discussed according to the existing literature related. The OR calculated for the main variables selected are shown in Table 1.

Table 1. Odds ratio estimated for occupational injuries variables.

Variable	Values	Neck		Back		Trunk		Upper Ex		Lower Ex		Multiple	
		OR	CI	OR	CI	OR	CI	OR	CI	OR	CI	OR	CI
Age	<45	1.94	1.8–2.1	0.84	0.8–0.9	0.522	0.4–0.5	0.918	0.8–0.9	1.004	1.0–1.0	1.011	0.9–1.1
	>45	1		1		1		1		1		1	
Nationality	National	1.76	1.4–2.0	0.91	0.8–1.0	1.017	0.8–1.2	0.815	0.7–0.8	1.067	0.9–1.1	1.136	0.9–1.3
	Foreign	1		1		1		1		1		1	
Length	<1 year	1.09	1.1–1.2	0.86	0.8–0.9	0.84	0.7–0.9	1.204	1.1–1.2	0.863	0.8–0.9	0.924	0.8–1.0
	>1 year	1		1		1		1		1		1	
Temporal	No	0.98	0.9–1.0	1.19	1.1–1.2	1.224	1.1–1.3	0.773	0.7–0.8	1.197	1.1–1.2	1.051	0.9–1.1
	Yes	1		1		1		1		1		1	
Public	Yes	1.18	1.1–1.2	0.99	0.9–1.0	0.872	0.7–0.9	0.824	0.7–0.8	1.207	1.1–1.2	0.915	0.8–1.0
	No	1		1		1		1		1		1	
Traffic	No	0.04	0.1–0.1	1.52	1.4–1.6	1.094	0.9–1.2	2.983	2.7–3.2	4.306	4.0–4.6	0.117	0.1–0.2
	Yes	1		1		1		1		1		1	
Monday	Yes	0.94	0.8–1.0	1.3	1.2–1.3	0.978	0.8–1.1	0.937	0.9–0.9	0.994	0.9–1.0	0.883	0.7–0.9
	No	1		1		1		1		1		1	
Severity	Light	6.5	3.6–11.5	4.94	3.2–7.5	0.188	0.1–0.2	1.831	1.5–2.2	1.399	1.1–1.6	0.241	0.1–0.2
	Rest	1				1		1		1		1	

3.1. Neck

Neck injuries obtained significant results for different variables. Men teachers younger than 45 years (OR = 1.946; 95%CI = 1.8–2.1), Spanish (OR = 1.769; 95%CI = 1.4–2.0), in a public organization (OR = 1.189; 95%CI = 1.1–1.2), in light accidents (OR = 6.501; 95%CI = 3.6–11.5) were significant and independently associated with neck injuries. On the other hand, traffic accidents (OR = 0.044; 95%CI = 0.1–0.1) were associated with a lower probability of neck injuries. These results are aligned with previous studies, which suggested that younger teachers were more likely to suffer a neck injury [27]. Similarly, men in their first year of service presented a higher risk (OR = 1.097; 95%CI = 1.1–1.2). Although, female teachers presented higher rates of neck and shoulders pains [34].

These results might be motivated by a lower occupational safety training, high level of psychosocial demands, or poor quality sleep in the adaptation period [35,36].

3.2. Back

Concerning back injuries, statistically significant and independent associations were found between temporal workers (OR = 1.191; 95%CI = 1.1–1.2), light (OR = 4.944; 95%CI = 3.2–7.5), traffic accidents (OR = 1.522; 95%CI = 1.4–1.6) happened on Monday (OR = 1.3; 95%CI = 1.2–1.3). In contrast, younger workers (OR = 0.849; 95%CI = 0.8–0.9) with less than 1 year of experience (OR = 0.865; 95%CI = 0.8–0.9) presented a lower probability of a back injury. In similar research focused only on female teachers, it was found a significantly increased prevalence of lower back MSDs between 40–49 years and 50–59 years of age [37]. Aligned with those findings previous studies pointed to aging as a risk factor for back injuries among teachers [27]. Some authors found that teachers with high physical activity and awkward body postures had a higher prevalence of low back pain [38]. Then, physical education [14] and special education teachers [39] presented higher risk of injuries associated with back pain.

3.3. Trunk

Injuries associated with the chest and internal organs, such as the stomach or heart, were classified as trunk injuries. Temporal workers presented risky values (OR = 1.224; 95%CI = 1.1–1.3). On the other hand, young teachers (OR = 0.522; 95%CI = 0.4–0.5), with less than one year experience (OR = 0.840; 95%CI = 0.7–0.9) were significantly and independently associated with a lower probability of trunk injuries. Aligned with these

results, previous authors also identified seniority as a risk factor for trunk injuries among teachers [40].

3.4. Upper and Lower Extremities

With regard to the upper extremities age (OR = 0; 95%CI = 0.8–0.9), national (OR = 0.865; 95%CI = 0.8–0.9) and public (OR = 0.865; 95%CI = 0.8–0.9) men teachers obtained protective values according to the odds ratios. In contrast less than one year-experience (OR = 1.204; 95%CI = 1.1–1.2), and traffic accidents (OR = 2.983; 95%CI = 2.7–3.2) obtained worse OR results for injuries in the upper extremities. In the case of temporal workers (OR = 1.197; 95%CI = 1.1–1.2), in public schools (OR = 1.207; 95%CI = 1.1–1.2) involved in traffic accidents, they were more probably to suffer injuries in the lower extremities. Static postures have been reported by previous authors as the cause of repetitive strain injuries [41]. In addition, lack of experience it was highlighted as a cause of concern for lower extremities injuries among physical education teachers [15]. Then, the causes of this type of injury should be explained by the combination of multiple factors.

3.5. Multiple Injuries

Regarding multiple injuries, they are typically associated with traffic accidents [24], in consequence, no traffic accidents were identified as a protective factor for multiple injuries (OR = 0.117; 95%CI = 0.1–0.2). These results are aligned with previous studies [27,42]. On the other hand age, nationality, length of service, and temporal workers did not obtain statistically significant results. Traffic accidents are the main cause of occupational death among teachers and these crashes are associated with commuting travels [42].

Table 2 summarized the protective effect of the variables analyzed.

Table 2. Protective vs risk factors in injuries variables.

Variable	Values	Neck	Back	Trunk	Upper Ex	Lower Ex	Multiple
Age	<45	Risk	Prot	Prot	Prot	N.S	N.S
	>45	Prot	Risk	Risk	Risk	N.S	N.S
Nationality	National	Risk	N.S	N.S	Prot	N.S	N.S
	Foreign	Prot	N.S	N.S	Risk	N.S	N.S
Length	<1 year	Risk	Prot	Prot	Risk	Prot	N.S
	>1 year	Prot	Risk	Risk	Prot	Risk	N.S
Temporal	No	N.S	Risk	Risk	Prot	Risk	N.S
	Yes	N.S	Prot	Prot	Risk	Prot	N.S
Public	Yes	Risk	N.S	Prot	Prot	Risk	N.S
	No	Prot	N.S	Risk	Risk	Prot	N.S
Traffic	No	Prot	Risk	N.S	Risk	Risk	Prot
	Yes	Risk	Prot	N.S	Prot	Prot	Risk
Monday	Yes	N.S	Risk	N.S	Prot	N.S	Prot
	No	N.S	Prot	N.S	Risk	N.S	Risk
Severity	Light	Risk	Risk	Prot	Risk	Risk	Prot
	Rest	Prot	Prot	Risk	Prot	Prot	Risk

4. Conclusions

Based on the obtained results, some variables studied were significantly and independently associated with injury to different parts of the body; these variables included age, nationality, length of service and injury severity. Male teachers younger than 45 years with less than one year of experience obtained better results for the majority of injury types,

although they were more likely to suffer a neck injury. In contrast, male teachers older than 45 years and experienced workers obtained worse results for the majority of injuries.

No variable with protective effects for all parts of the body injured was detected. Similarly, no variable was found with risk effects for all injuries. For example, young teachers were protected against back and trunk injuries, but they were at higher risk of neck injuries, while they did not obtain significant values for injuries to the lower extremities and multiple body parts.

Neck injuries were associated with lack of experience. This variable, combined with other factors not included in accident reports, such as a high level of psychosocial demands or poor quality sleep, should be considered to prevent this type of injury. For back injuries, older male teachers presented worse results.

Specific training programs should be provided for this population to reduce the number of back injuries. To prevent multiple injuries associated with traffic accidents, preventive measures such as mobility programs or institutional carpooling initiatives could improve safety conditions while commuting.

The findings obtained might be useful to the proper design and development of occupational safety training programs focused on injuries among male teachers. Safety training for teachers adapted to their risk profiles and injuries could improve accident rates in the sector.

4.1. Limitations

This research analysed variables included in official accident reports to the Labour Authority through the Delt@ system. It was not possible to consider accidents that occurred but did not involve notification of the Labour Authority. It is also possible that additional variables may have influenced the occurrence of accidents but were not included in the report; as such, it was not possible to analyse such possible influencers.

In the Database analyzed, there is no difference between injuries caused by accident, injuries by disorders and illness. In Spain, if a worker suffers an injury at work (Neck pain, strain, low back pain, ...) , it is commonly considered as "occupational accident", and reported to authorities using the Official Occupational Accident Report. In the majority of the occupational injuries among teachers, it is not possible to identify only one cause. Many of them are associated with repetitive movements, awkward postures, or overload. Moreover, the study may be analysing sick leave (absenteeism) in some case, regardless of the cause. Illness and injuries caused by accidents and injuries caused or aggravated by work (such as WRMSD) may be confounded and hence resulting in bias in the analysis.

4.2. Future Research

Once the main variables associated with each type of injury have been identified, other professionals and researchers can develop preventive measures based on these findings.

Based on the results, specific OSH programs can be designed according to the identified risk variables. For example, OHS training programs focused on neck injury prevention should be implemented among beginning teachers. Whereas OSH training among experienced teachers should focus on back injuries.

The combination of the official accident reports with some questionnaires among the teachers injured in future research, could provide additional results.

Author Contributions: Conceptualization, M.d.C.R.-M. and A.L.-A.; methodology, M.d.C.R.-M. and A.L.-A.; software, M.d.C.R.-M.; validation, M.d.C.R.-M.; formal analysis, A.L.-A.; investigation, M.d.C.R.-M. and A.L.-A.; resources, A.L.-A.; data curation, A.L.-A.; writing—original draft preparation, All authors; writing—review and editing, All authors; visualization, All authors; supervision, A.L.-A.; project administration, A.L.-A.; funding acquisition A.L.-A. All authors have read and agreed to the published version of the manuscript.

Funding: This research received funding from the project Propuesta de sistema inteligente de movilidad laboral para la reducción de los accidentes laborales de tráfico from "Plan Propio- Universidad de Málaga".

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: Not applicable.

Acknowledgments: The authors would like to acknowledge "Universidad de Málaga".

Conflicts of Interest: The authors declare no conflict of interest.

Abbreviations

The following abbreviations are used in this manuscript:

CI	Confidence Interval
OR	Odd Ratio
Prot	Protective factor
Sig	Bilateral Significance at 95%

References

1. Van den Broek, K.; De Greef, M.; Van der Heyden, S.; Schmitz-Felten, E.; Kunl, K. *Socio-Economic Costs of Accidents at Work and Work- Related Ill Health*; EU Publications: Bologna, Italy, 2011.
2. Erick, P.N.; Smith, D.R. Musculoskeletal disorders in the teaching profession: An emerging workplace hazard with significant repercussions for developing countries. *Ind. Health* **2015**, *53*, 385–386. [CrossRef] [PubMed]
3. Ünlü, H.; Filiz, B. Work ability of the Turkish physical education teachers. *Res. Q. Exerc. Sport* **2019**, *90*, 666–677. [CrossRef] [PubMed]
4. Vassallo, A.J.; Pappas, E.; Stamatakis, E.; Hiller, C.E. Injury fear, stigma, and reporting in professional dancers. *Saf. Health Work* **2019**, *10*, 260–264. [CrossRef] [PubMed]
5. Erick, P.N.; Smith, D.R. A systematic review of musculoskeletal disorders among school teachers. *BMC Musculoskelet. Disord.* **2011**, *12*, 260. [CrossRef]
6. Alias, A.N.; Karuppiah, K.; How, V.; Perumal, V. Prevalence of musculoskeletal disorders (MSDS) among primary school female teachers in Terengganu, Malaysia. *Int. J. Ind. Ergon.* **2020**, *77*, 102957. [CrossRef]
7. Ramanandi, V.H. Association between Work Experience and Work-Related Musculoskeletal Disorders among the Clinical and Teaching Physiotherapists of Gujarat, India—An Observational Study. *Int. J. Occup. Saf. Health* **2021**, *11*, 9–15. [CrossRef]
8. Amit, L.M.; T Malabarbas, G. Prevalence and risk-factors of musculoskeletal disorders among provincial high school teachers in the philippines. *J. UOEH* **2020**, *42*, 151–160. [CrossRef]
9. Malik, N.A.; Björkqvist, K. Occupational stress and mental and musculoskeletal health among university teachers. *Eurasia J. Med. Investig.* **2018**, *2*, 139–147.
10. Nyawose, Z.Z.; Naidoo, R. Prevalence of shoulder musculoskeletal disorders among school teachers: A systematic review. *S. Afr. J. Res. Sport Phys. Educ. Recreat.* **2019**, *41*, 51–61.
11. Ng, Y.M.; Voo, P.; Maakip, I. Psychosocial factors, depression, and musculoskeletal disorders among teachers. *BMC Public Health* **2019**, *19*, 234. [CrossRef]
12. Kovač, M.; Leskošek, B.; Hadžić, V.; Jurak, G. Occupational health problems among slovenian physical education teachers. *Kinesiology* **2013**, *45*, 92–100.
13. Lemoyne, J.; Laurencelle, L.; Lirette, M.; Trudeau, F. Occupational health problems and injuries among Quebec's physical educators. *Appl. Ergon.* **2007**, *38*, 625–634. [CrossRef]
14. Goossens, L.; Vercruysse, S.; Cardon, G.; Haerens, L.; Witvrouw, E.; De Clercq, D. Musculoskeletal injuries in physical education versus non-physical education teachers: A prospective study. *J. Sport. Sci.* **2016**, *34*, 1107–1115. [CrossRef] [PubMed]
15. Van Beijsterveldt, A.M.; Richardson, A.; Clarsen, B.; Stubbe, J. Sports injuries and illnesses in first-year physical education teacher education students. *BMJ Open Sport Exerc. Med.* **2017**, *3*, e000189. [CrossRef]
16. Ramsay, J.; Denny, F.; Szirotnyak, K.; Thomas, J.; Corneliuson, E.; Paxton, K.L. Identifying nursing hazards in the emergency department: A new approach to nursing job hazard analysis. *J. Saf. Res.* **2006**, *37*, 63–74. [CrossRef] [PubMed]
17. Lima, C.; Roriz, A.; Leite, A.; Colim, A.; Carneiro, P. Exposure to Musculoskeletal Risk of Piano Teachers. *Stud. Syst. Decis. Control* **2020**, *277*, 419–426. [CrossRef]
18. Blanco-Piñeiro, P.; Díaz-Pereira, M.P.; Martínez, A. Musicians, postural quality and musculoskeletal health: A literature's review. *J. Bodyw. Mov. Ther.* **2017**, *21*, 157–172. [CrossRef]
19. Ajidahun, A.T.; Myezwa, H.; Mudzi, W.; Wood, W.A. Barriers and facilitators in implementing an exercise-based injury prevention program for string players. *Work* **2019**, *64*, 713–720. [CrossRef]

20. Abebaw, T.A.; Weldegebriel, M.K.; Gebremichael, B.; Abaerei, A.A. Prevalence and associated factors of low back pain among teachers working at governmental primary schools in Addis Ababa, Ethiopia: A cross sectional study. *Biomed. J.* **2018**, *1*, 3. [CrossRef]
21. Vidal-Conti, J.; Carbonell, G.; Cantallops, J.; Borràs, P.A. Knowledge of low back pain among primary school teachers. *Int. J. Environ. Res. Public Health* **2021**, *18*, 11306. [CrossRef]
22. Prieto-González, P.; Šutvajová, M.; Lesňáková, A.; Bartík, P.; Bul'áková, K.; Friediger, T. Back pain prevalence, intensity, and associated risk factors among female teachers in Slovakia during the COVID-19 pandemic: A cross-sectional study. *Healthcare* **2021**, *9*, 860. [CrossRef]
23. Senthilkumar, R.; Parthiban, B.; Parghavi, M. Evaluation of work related musculoskeletal disorders in shoulder and neck with ergonomic intervention among school teachers. *Res. J. Pharm. Technol.* **2019**, *12*, 3726–3730. [CrossRef]
24. Kirupa, K.; Mary, S.D.; Nithyanisha, R.; Vaishnavi, G.; Pavithralochini, V.; Jaiganesh, G. A comparative study of posture alteration and stretching program to reduce neck pain in teachers. *Biomedicine* **2020**, *40*, 99–101.
25. Bliekendaal, S.; Stubbe, J.; Verhagen, E. Dynamic balance and ankle injury odds: A prospective study in 196 Dutch physical education teacher education students. *BMJ Open* **2019**, *9*, e032155. [CrossRef] [PubMed]
26. Carmen-Rey Merchán, M.D.; López-Arquillos, A. Gender differences in teachers' occupational accidents. In *Health Care for Women International*; Talylor Francis Group: Abingdon, UK, 2021; pp. 1–11.
27. Merchán, M.D.C.R.; López-Arquillos, A. Injury analysis of teachers' occupational accidents. *Work* **2022**, *71*, 215–222. [CrossRef] [PubMed]
28. Camino López, M.A.; Gonzalez Alcantara, O.J.; Fontaneda, I. Gender differences in commuting injuries in Spain and their impact on injury prevention. *BioMed Res. Int.* **2017**, *2017*, 3834827. [CrossRef] [PubMed]
29. Vaghela, N.; Parekh, S. Prevalence of the musculoskeletal disorder among school teachers. *Natl. J. Physiol. Pharm. Pharmacol.* **2018**, *8*, 197–201. [CrossRef]
30. Ko, D.H.; Jeong, B.Y. Work-related injuries of educational support staff in schools. *Int. J. Occup. Saf. Ergon.* **2019**, *25*, 568–574. [CrossRef]
31. Keogh, M.; Roan, A. Exploring teachers' early-retirement decisions: A qualitative study. *Work Aging Retire.* **2016**, *2*, 436–446. [CrossRef]
32. UNESCO. *The World Needs Almost 69 Million New Teachers to Reach the 2030 Education Goals*; UNESCO Institute for Statistics: Paris, France, 2016. [CrossRef]
33. Schiaffino, A.; Rodríguez, M.; Pasarín, M.; Regidor, E.; Borrell, C.; Fernández, E. ¿Odds ratio o razón de proporciones? Su utilización en estudios transversales. *Gac. Sanit.* **2003**, *17*, 70–74. [CrossRef]
34. Yue, P.; Liu, F.; Li, L. Neck/shoulder pain and low back pain among school teachers in China, prevalence and risk factors. *BMC Public Health* **2012**, *12*, 789. [CrossRef] [PubMed]
35. Ng, Y.M.; Voo, P.; Maakip, I. The relationships between risk factors and musculoskeletal disorders among teachers: An exploratory investigation in Malaysia. In Proceedings of the Kuala Lumpur International Communication, Education, Language and Social Sciences, Bandar Baru Bangi, Malaysia, 23–24 November 2019; Volume 13.
36. De Souza, J.M.; Pinto, R.Z.; Tebar, W.R.; Gil, F.C.; Delfino, L.D.; Morelhão, P.K.; Da Silva, C.C.; Oliveira, C.B.; Christofaro, D.G. Association of musculoskeletal pain with poor sleep quality in public school teachers. *Work* **2020**, *65*, 599–606. [CrossRef] [PubMed]
37. Alias, A.N.; Karuppiah, K.; How, V.; Perumal, V. Does Prolonged Standing at Work Among Teachers Associated With Musculoskeletal Disorders (MSDs)? *Malays. J. Med. Health Sci.* **2020**, *16*, 281–289.
38. Erick, P.N.; Smith, D.R. Low back pain among school teachers in Botswana, prevalence and risk factors. *BMC Musculoskelet. Disord.* **2014**, *15*, 359. [CrossRef] [PubMed]
39. Cheng, H.Y.K.; Wong, M.T.; Yu, Y.C.; Ju, Y.Y. Work-related musculoskeletal disorders and ergonomic risk factors in special education teachers and teacher's aides. *BMC Public Health* **2016**, *16*, 137. [CrossRef]
40. Furuya, S.; Nakahara, H.; Aoki, T.; Kinoshita, H. Prevalence and causal factors of playing-related musculoskeletal disorders of the upper extremity and trunk among Japanese pianists and piano students. *Med. Probl. Perform. Artist.* **2006**, *21*, 112–117. [CrossRef]
41. Chaiklieng, S.; Suggaravetsiri, P. Risk factors for repetitive strain injuries among school teachers in Thailand. *Work* **2012**, *41*, 2510–2515. [CrossRef]
42. Rey-Merchán, M.D.C.; López-Arquillos, A. Organizational and personal factors in occupational traffic injuries at work in Spain. *Traffic Inj. Prev.* **2021**, *22*, 519–523. [CrossRef]