



Could the complying with WHO physical activity recommendations improve stress, burnout syndrome, and resilience? A cross-sectional study with physical education teachers

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Abstract

Purpose Teachers are exposed to inherent psychosocial risks in the workplace such as chronic stress, psychological distress, exhaustion, and burnout syndrome. To compare the values in psychosocial variables based on compliance with the recommendations for physical activity by the World Health Organization (WHO) and the type of physical activity performed.

Methods The study had a non-experimental and comparative design, with measurements in a single group. The sample was composed of 415 physical education teachers from Spain, with an age range of 21–53 years (28.78 ± 6.15) and a heterogeneous distribution of gender (69.4% male; 30.6% women). The Perceived Stress Scale, the Maslach Burnout Inventory, the Connor–Davidson Resilience Scale, and an Ad-Hoc questionnaire were used to record the sociodemographic aspects and physical-sports practice.

Results Most of the teachers complied with the recommendations for physical activity practice ($n = 335$; 80.7%). Physical activity was associated with lower signs of burnout and a greater ability to overcome. Although, teachers who did not comply with WHO recommendations, showed greater stress and emotional exhaustion. In conclusion, enough practice of physical activity based on WHO was shown as a preventive factor of stress and signs of burnout.

Conclusions The findings suggest that perform physical activity based on the WHO recommendations helps for work stress prevention and burnout syndrome in teachers, as well as to overcome work adversities.

Keywords Stress · Burnout · Resilience · Physical education · Teachers

Introduction

Teaching is considered a difficult profession where the inherent psychosocial risks and the educational environment are one of the main factors of work accidents or diseases. The International Labour Organization (ILO) indicates that the problems of chronic stress, anxiety, exhaustion, or depression are increasing in this sector [1, 2]. Specifically, burnout syndrome is understood as a prolonged state of stress [3] and is a psychosocial indicator that directly affects mental health and physical well-being [4, 5]. Also, burnout syndrome is presented in different ways such as emotional exhaustion, irritability, and lack of motivation towards work (depersonalization), reduced achievement feelings like failure or incompetence [6].

However, teachers must be resilient to overcome these circumstances and learn to deal adversity in the current educational systems [7]. In situations of adversity at work, de

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Vera-García and Gabari-Gambarte [8] mention that the most resilient teachers achieve better skills and competencies in work commitment and reduce chronic stress; while, the less resilient teachers have a predisposition to increase the effect of tiredness and indifference. Furthermore, resilience has been shown to help reduce perceived stress and feelings of exhaustion in teachers [9].

In this sense, physical-sports activity programs are one of the strategies used to promote resilience [10]. Physical activity is associated with health promotion on the physical, psychosocial, cognitive, and emotional levels [11, 12]. Studies showed that physical activity is a priority element in today's society, with special importance in social and health policies [13, 14]. Specifically, physical activity has been considered an essential tool that directly affects the quality of life and presents psychosocial benefits in teaching professionals [15–17]. Programs that include physical-sports activity have been effective for reducing work stress and improving teacher satisfaction, as well as facilitating coping strategies to face adversities in the work environment [18–20].

In this sense, the World Health Organization (WHO) [21] in its document of global recommendations on physical activity for health, disseminates that in adults (18–64 years) the practice a minimum of 150 min per week of moderate or 75 min of vigorous aerobic physical activity helps to improve muscle and cardiorespiratory functions, as well as reducing the risk of non-communicable diseases and mental health problems. Failure to comply with these recommendations and a sedentary lifestyle have a negative impact on people's lives [22], and are associated with cardiovascular diseases such as obesity, heart attacks, high cholesterol, diabetes and the development of various types of cancer [23, 24]. Likewise, Callow et al. [25] state that low levels of physical activity favor the development of psychological illnesses such as depression, anxiety, and stress.

Therefore, the main purpose of the present study was to compare the reported values in psychosocial variables such as stress, burnout syndrome, and resilience related to compliance or not compliance with the WHO physical activity recommendations and the type of physical activity performed by physical education teachers.

Materials and methods

Design and participants

A quantitative study with a non-experimental design (ex post facto), of a comparative nature, was carried out by measuring a single group. Dependent variables were recorded to describe parameters related to stress, burnout syndrome, resilience, and practice of physical activity. The study sample was composed of 415 physical education teachers from

Table 1 Participants' region distribution

Region	Frequency (<i>n</i>)	Relative frequency (%)
Andalucía	108	26.0
Castilla La Mancha	77	18.6
Valencia	48	11.6
Madrid	47	11.3
Galicia	32	7.7
Castilla y León	26	6.3
Murcia	20	4.8
Cataluña	14	3.4
Extremadura	10	2.4
Baleares	8	1.9
Asturias	8	1.9
Aragón	7	1.7
Canarias	5	1.2
País Vasco	2	0.5
Navarra	1	0.2
Cantabria	1	0.2
La Rioja	1	0.2

Spain (Table 1), with a heterogeneous distribution according to gender, being 288 male (69.4%) and 127 women (30.6%). A convenience sampling was used to select the participants that need to have an academic title that allows teaching physical education as inclusion criteria.

Instruments and variables

Ad-Hoc questionnaire

It is an own elaboration sheet where the sociodemographic and physical-sports aspects were collected by self-registration. The gender and age of the participants, the region of origin, the compliance of physical activity recommended by the WHO [21] as 150 min/week of moderate physical activity or 75 min/week vigorous and the type of physical-sports practice based on the adapted classification of Castro-Sánchez et al. [26] were recorded.

Perceived Stress Scale (PSS)

The original "Perceived Stress Scale (PSS)" questionnaire by Cohen et al. [27] was adapted into Spanish by Remor [28]. This scale is a self-registration instrument in which the perceived levels of stress in people during the last month are evaluated. It is composed of 14 items that are answered through a Likert scale with five alternative responses (0 = never, 1 = rarely, 2 = occasionally, 3 = often, and 4 = very often). The sum of the items indicates that a

higher score is related to higher level of perceived stress. In this way, percentiles can be extracted in which stress is classified as low, moderate or high. In these total scores, it must be considered that the values of items 4, 5, 6, 7, 9, 10, and 13 must be inverted. For example, item 5: “How often have you felt that you have effectively faced the important changes that have been happening in your life?”. The original study by Cohen et al. [27] determined the reliability of $\alpha=0.85$, while, Remor (2006) shows values of $\alpha=0.81$ in the adaptation to Spanish. In the present study, the value obtained in the internal consistency of the scale was $\alpha=0.893$, which guarantees the reliability of the scale.

Maslach Burnout Inventory (MBI)

The version adapted to Spanish by Seisdedos [29] was used from the original version “Maslach Burnout Inventory (MBI)” by Maslach and Jackson [30]. This questionnaire consists of 22 items that are answered using a Likert-type scale (where 0 = Never and 6 = Daily) that measures the burnout level. If participants reach percentiles greater than 75 are included in the high category, between 75 and 25 in the middle category, and below 25 points in the low category. Likewise, this scale responds to three dimensions: (a) Emotional exhaustion (EE) that assess the experience of being exhausted emotionally due to the high demands for work/study and consists of nine items (1, 2, 3, 6, 8, 13, 14, 16, 20); (b) Depersonalization (D) that measures the relational distancing through five items (5, 10, 11, 15, 22); and (c) Personal fulfillment (PF) that describes the successful making of work/study towards others, as well as the competence feelings through eight items (4, 7, 9, 12, 17, 18, 19, 21).

The internal consistency of the original questionnaire proposed by Maslach and Jackson [30] showed a Cronbach’s alpha coefficient for all items of 0.83 (EE: $\alpha=0.74$; RP: $\alpha=0.77$; D: $\alpha=0.59$). Instead, Seisdedos [29] obtained $\alpha=0.90$ for EE, $\alpha=0.79$ for D and $\alpha=0.71$ for RP. In the present study, the general reliability was $\alpha=0.68$, and specifically for each dimension was $\alpha=0.849$ for EE, $\alpha=0.723$ for D, and $\alpha=0.74$ for RP that guarantees the reliability of the present study data.

Connor–Davidson Resilience Scale (CD-RISC)

The version validated in Spanish by Crespo et al. [31] from the “Connor–Davidson Resilience Scale, CD-RISC” by Connor and Davidson [32] was used. This scale consists of 25 items, where the compliance of the statements in the last month must be indicated on a Likert-type scale where 0 = “it was not true at all” and 4 = “true usually”. Scores can range from 0 to 100, obtaining greater resilience with higher scores. Attending Serrano-Parra et al. [33] this construct can

be categorized into low resilience (first quartile), moderate resilience (second and third quartile), and high resilience (fourth quartile). This scale is divided into five dimensions: (a) Factor 1 reflects the notion of personal competence, high standards and tenacity (PECT) composed of Items 10, 11, 12, 16, 17, 23, 24, 25; (b) Factor 2 is related to confidence in one’s instincts, tolerance to negative effects and strengthening of the stress effects (TTE) composed of Items 6, 7, 14, 15, 18, 19, 20; (c) Factor 3 refers to positive change acceptance and secure relationships (PASR) composed of Items 1, 2, 4, 5, 8; (d) Factor 4 is related to control and purpose (CONP) composed of Items 13, 21, 22; and (e) Factor 5 with spiritual influences (SE) composed of Items 3 and 9.

The original version [32] obtained good results with a Cronbach’s alpha of 0.89 and a test–retest reliability of 0.87 in the general population. In the study by Serrano-Parra et al. [33], the general reliability was $\alpha=0.906$ and obtained different values for each dimension: self-efficacy–tenacity, $\alpha=0.822$; tolerance–strengthening, $\alpha=0.677$; acceptance and safe relationships, $\alpha=0.677$; control and purpose, $\alpha=0.699$; spirituality, $\alpha=0.344$. In the present study, a reliability of $\alpha=0.911$ was obtained for the entire scale, as well as for the different factors: PECT, $\alpha=0.836$; TTE, $\alpha=0.746$; PASR, $\alpha=0.786$; CONP, $\alpha=0.641$; and SE, $\alpha=0.495$. Only spirituality (SE) category did not guarantee the scale reliability.

Procedure

A google form was created with the instruments specified above. First, the purpose of the study was explained, as well as the acceptance of participation in the study ensuring the anonymity of the participants. For his administration, the form was sent by e-mail. To ensure the reliability of the answers, one of the questions was related to the academic degree that allowed them their professional development, and two questions were duplicated, to verify that the questions had not been answered randomly. In this way, several cases were detected and a total of 42 questionnaires were deleted. This research study has complied with the principles of ethics for research with human established in the Declaration of Helsinki on 1975 and under the supervision of the Research Ethics Committee of the University of Granada (1230/CEIH/2020).

Statistical analysis

The normality and homogeneity of the variance of the variables were verified through the Kolmogorov–Smirnov test. To establish comparisons between variables, Student’s *t* test and contingency tables were used for

independent samples. Differences between participants were determined with Pearson's chi-squared test. A one-way analysis of variance (ANOVA) was also performed with the Bonferroni post hoc test for the analysis between physical-sport variables. A significance level of $p < 0.05$ and $p < 0.01$ was established. The magnitude of the differences (effect size; ES) was obtained using Cohen's d [34]. Their interpretation was established as null (0–0.19), low (0.20–0.49), moderate (0.50–0.79), or high (≥ 0.80) [35]. Thus, the 95% confidence interval (95% CI) was calculated for each effect size. Statistical software SPSS 25.0 (SPSS, IBM, SPSS Statistics, v.25.0 Chicago, IL, USA) was used for data analysis and treatment.

Results

Table 2 shows the mean \pm SD of the psychosocial variables. In this case, t test expressed a significance difference between the participants that compliance and no compliance with the practice of 150 min or more of physical activity per week. These mean comparisons highlight that the participants who did not reach the recommended

minimum of physical activity present the highest levels of ESUM ($M = 2.63$; $SD = 0.60$; $ES = 0.678$) and EE ($M = 3.71$; $SD = 0.81$; $ES = 0.569$).

For RP ($p = 0.048$; $ES = 0.307$), physical education teachers who if they reached the minimum recommendations for physical activity obtained the highest mean values ($M = 2.96$; $SD = 0.73$). At a statistical level of $p \leq 0.05$, the participants who carried out 150 min or more of physical activity per week, presented higher data for RSUM ($M = 2.84$; $SD = 0.56$; $TE = 0.453$), PECT ($M = 3.04$; $SD = 0.63$; $ES = 0.528$), TTE ($M = 2.66$; $SD = 0.66$; $ES = 0.415$), PASR ($M = 3.01$; $SD = 0.68$; $ES = 0.370$) and CONP ($M = 2.89$; $SD = 0.79$; $TE = 0.309$).

Table 3 lists the categories of psychosocial variables according to physical activity practice. Statistically significant data were recorded ($p \leq 0.05$). Subjects who obtained low stress (92.1%), followed by medium stress (85.5%) and high stress (67.2%), performed physical activity 150 min or more a week. For burnout syndrome, it was highlighted that of the people who did not present burnout syndrome (89.1%), they practiced 150 min or more of weekly physical activity. Likewise, the subjects who reported that they

Table 2 Comparison of stress, burnout syndrome and resilience by the compliance or not compliance with the volume of physical activity recommendations by the WHO

		PA	<i>M</i>	<i>SD</i>	Levene test		<i>T</i> test			<i>ES (d)</i>	CI 95%							
					<i>F</i>	Sig	<i>T</i>	Gl	Sig									
Perceived stress	ESUM	Yes	2.19	0.66	1.407	0.236	-5.365	129.25	0.001	0.678	[0.430; 0.926]							
		No	2.63	0.60														
Burnout syndrome	EE	Yes	3.24	0.83	0.001	0.973	-4.503	121.86	0.001	0.569	[0.322; 0.816]							
		No	3.71	0.81														
	D	Yes	2.88	0.94								3.548	0.060	-0.913	132.44	0.362	0.109	[-0.135; 0.353]
		No	2.98	0.82														
	PF	Yes	2.96	0.73	1.725	0.600	2.315	129.51	0.048	0.307	[0.062; 0.552]							
		No	2.74	0.66														
Resilience	RSUM	Yes	2.84	0.56	2.528	0.113	3.639	110.52	0.001	0.453	[0.207; 0.699]							
		No	2.58	0.63														
	PECT	Yes	3.04	0.63	1.992	0.159	4.242	111.55	0.001	0.528	[0.281; 0.774]							
		No	2.70	0.70														
	TTE	Yes	2.66	0.66	0.519	0.472	3.369	112.02	0.001	0.415	[0.170; 0.661]							
		No	2.38	0.73														
	PASR	Yes	3.01	0.68	4.641	0.032	2.751	108.65	0.007	0.370	[0.125; 0.615]							
		No	2.75	0.79														
	CONP	Yes	2.89	0.79	2.207	0.138	2.461	111.32	0.014	0.309	[0.065; 0.554]							
		No	2.64	0.88														
SE	Yes	2.22	1.02	4.420	0.036	-1.108	143.65	0.270	0.132	[-0.112; 0.376]								
	No	2.35	0.82															

PA physical activity, ESUM Estrés summation, EE emotional exhaustion, D depersonalization, PF personal fulfillment, RSUM resilience summation, PECT personal competence, high standards, and tenacity, TTE trust, tolerance, and empowerment, PASR positive acceptance and secure relationships, CONP control and purpose, SE spiritual influences

Table 3 Frequency and relative frequency of participants that compliance and not compliance physical activity recommendations in the different categories of stress, burnout syndrome, and resilience

Output variable	Category	Physical activity		Total	Sig
		Yes	No		
Perceived stress	Low	35 (92.1%)	3 (7.9%)	38 (100%)	$p \leq 0.05$
	Medium	218 (85.5%)	37 (14.5%)	255 (100%)	
	High	82 (67.2%)	40 (32.8%)	122 (100%)	
Burnout syndrome	Not burnout	139 (89.1%)	17 (10.9%)	156 (100%)	$p \leq 0.05$
	Low burnout	109 (73.6%)	39 (26.4%)	148 (100%)	
	Medium burnout	78 (78.0%)	22 (22.0%)	100 (100%)	
	High burnout	9 (81.8%)	2 (18.2%)	11 (100%)	
Resilience	Low	0 (0.0%)	1 (100.0%)	1 (100%)	$p \leq 0.05$
	Medium	178 (76.7%)	54 (23.3%)	232 (100%)	
	High	156 (85.7%)	26 (14.3%)	182 (100%)	

practiced physical activity showed the highest percentages of high resilience (85.7%).

Table 4 shows the results of the relationships between psychosocial variables and physical-sports practice. Statistically significant differences were found ($p \leq 0.05$), where the participants who did not practice any type of physical-sports modality had the highest mean values for SUME ($M = 2.70$; D.T. = 0.59) in relation to those that do so in INCS (TE = 0.744), ISWC (TE = 0.960), CCS (TE = 0.861), and CSWC (TE = 0.678). The same occurs for AE ($M = 3.72$; D.T. = 0.71), although in this case the effect is associated with INCS (TE = 0.522), ISWC (TE = 1.029), and CCS (TE = 0.777).

Significant data were also obtained ($p \leq 0.05$), in the subjects that do not perform any type of sport, they report lower resilience values ($M = 2.52$; D.T. = 0.68) and lower CPET levels ($M = 2.57$; D.T. = 0.76) y APRS ($M = 2.66$; D.T. = 0.81), comparing this relationship with the INCS (TE = 0.491; TE = 0.719; TE = 0.473), ISWC (TE = 0.802; TE = 0.957; TE = 0.776) y CSWC (TE = 0.588).

Concerning the above, Table 5 shows the relationship between the categories of psychosocial variables and the practice of sport, for which statistically significant differences were found ($p \leq 0.05$). Teachers who practice individual sports without contact showed the highest percentages of high stress (42.6%), followed by those who do not practice any type (26.2%). Along the same lines, among the teachers who presented severe burnout values, they practiced individual sports without contact (27.3%), group sports without contact (27.3%) and contact (27.3%). Thus, among the participants who presented a higher percentage of high resilience, they practiced individual sports without contact (50.5%) and group sports with contact (16.5%).

Discussion

The purpose of this study was to compare whether compliance with the volume of physical activity recommended by the WHO could improve psychosocial aspects such as stress, burnout syndrome and resilience in physical education teachers, in addition to comparing it according to the type of physical activity-sports performed. Several studies address these constructs in isolation or show a similar nature [36–40]. However, the physical activity recommendations proposed by the WHO [21] have only been used for studies related to congenital problems, mortality and quality of life in adults [41–44]. However, from the knowledge of the authors, this is the first study that focuses on the specific group of physical education teachers, hosting participants from all over the national territory and as a whole explores the relationships between psychosocial variables and the recommendations of WHO [21] physical activity practice.

In this sense, those teachers who did not practice the minimum recommended hours of physical activity per week or some type of sport, obtained the highest levels of stress and emotional attention. On the other hand, those who did work three hours or more a week showed good personal fulfillment. This is confirmed by the results obtained by Jodra and Domínguez [45], in which they point out that those teachers who are physically inactive are those who presented a greater predisposition to develop pathologies such as anxiety and burnout. As Raven and Kleinert [46] or Smetackova [47] showed, negative associations were found between physical activity and emotional exhaustion, with this practice of physical activity being a predictor of exhaustion. The practice of regular physical activity has an impact on the quality of life [48] and presents both physical and psychological benefits in people who are dedicated to teaching, as it contributes to reducing the levels of perception of factors related to diseases related to negative subjective health states [15, 49, 50]. Thus, several studies have carried out intervention programs based on physical activity and have shown to be

Table 4 Psychosocial variables according to physical-sports practice

Variable	Category	Sport	Mean	DT	F	Sig	TE (d)	IC 95%
Perceived stress	SUME	NP	2.70	0.59	7.212	$p \leq 0.05$ a, b, c, d	0.744 ^a	[0.445; 1.040]
		INCS	2.22	0.66			0.960 ^b	[0.529; 1.391]
		ISWC	2.11	0.65			0.861 ^c	[0.459; 1.263]
		CCS	2.16	0.67			0.678 ^d	[0.318; 1.038]
		CSWC	2.27	0.67				
Burnout syndrome	EE	NP	3.72	0.71	5.983	$p \leq 0.05$ a, b, c	0.522 ^a	[0.227; 0.817]
		INCS	3.30	0.83			1.029 ^b	[0.595; 1.464]
		ISWC	2.96	0.78			0.777 ^c	[0.378; 1.175]
		CCS	3.14	0.79				
		CSWC	3.43	0.92				
	D	NP	3.00	0.85	1.171	$p \geq 0.05$	NP	NP
		INCS	2.93	0.94				
		ISWC	2.71	0.82				
		CCS	2.71	0.98				
		CSWC	2.95	0.88				
PF	NP	2.81	0.73	2.145	$p \geq 0.05$	NP	NP	
	INCS	3.00	0.71					
	ISWC	2.99	0.78					
	CCS	2.71	0.66					
	CSWC	2.98	0.70					
Resilience	SUMR	NP	2.52	0.68	4.473	$p \leq 0.05$ a, b	0.491 ^a	[0.196; 0.786]
		INCS	2.82	0.59			0.802 ^b	[0.378; 1.227]
		ISWC	2.99	0.40				
		CCS	2.81	0.44				
		CSWC	2.82	0.61				
	CPST	NP	2.57	0.76	7.415	$p \leq 0.05$ a, b, d	0.719 ^a	[0.421; 1.018]
		INCS	3.04	0.62			0.957 ^b	[0.526; 1.388]
		ISWC	3.20	0.46			0.588 ^d	[0.231; 0.947]
		CCS	2.96	0.63				
		CSWC	2.99	0.67				
	TTE	NP	2.35	0.80	2.801	$p \geq 0.05$	NP	NP
		INCS	2.61	0.72				
		ISWC	2.79	0.57				
		CCS	2.65	0.49				
		CSWC	2.66	0.63				
PASR	NP	2.66	0.81	4.172	$p \leq 0.05$ a, b	0.473 ^a	[0.178; 0.767]	
	INCS	3.01	0.72			0.776 ^d	[0.352; 1.119]	
	ISWC	3.20	0.47					
	CCS	3.00	0.54					
	CSWC	2.89	0.74					
CONP	NP	2.66	0.97	0.822	$p \geq 0.05$	NP	NP	
	INCS	2.87	0.80					
	ISWC	2.86	0.63					
	CCS	2.90	0.62					
	CSWC	2.84	0.92					
SI	NP	2.31	0.85	1.611	$p \geq 0.05$	NP	NP	
	INCS	2.15	1.04					
	ISWC	2.48	1.02					
	CCS	2.17	1.00					
	CSWC	2.41	0.90					

Table 4 (continued)

SUME stress summatory, *EE* emotional exhaustion1, *D* depersonalization, *PF* personal fulfillment; *SUMR* summatory of resilience, *CPST* personal competence, high standards, and tenacity, *TTE* trust, tolerance, and empowerment, *PASR* positive acceptance and secure relationships, *CONP* control and purpose, *SI* spiritual influences, *NP* no practice, *INCS* individual non-contact sport, *ISWC* individual sport with contact, *CCS* contactless collective sports, *CSWC* collective sport with contact

^aDifferences between NP and DISC

^bDifferences between NP and ISWC

^cDifferences between NP and CCS

^dDifferences between NP and CSWC

^eDifferences between INCS and ISWC

^fDifferences between INCS and CCS

^gDifferences between INCS and CSWC

^hDifferences between ISWC and CCS

ⁱDifferences between ISWC and CSWC

^jDifferences between CCS and CSWC

Table 5 Categories of psychosocial variables according to types of sports practiced

Variable	Category	Sport					Total	Sig
		NP	INCS	ISWC	CS	CSWC		
Perceived stress	Low	3 (7.9%)	18 (47.4%)	5 (13.2%)	8 (21.1%)	4 (10.5%)	38 (100%)	$p \leq 0.05$
	Medium	23 (9.0%)	134 (52.5%)	26 (10.2%)	31 (12.2%)	41 (16.1%)	255 (100%)	
	High	32 (26.2%)	52 (42.6%)	7 (5.7%)	8 (6.6%)	23 (18.9%)	122 (100%)	
Burnout syndrome	No burnout	12 (7.7%)	73 (46.8%)	25 (16.0%)	22 (14.1%)	24 (15.4%)	156 (100%)	$p \leq 0.05$
	Low burnout	31 (20.9%)	69 (46.6%)	9 (6.1%)	16 (10.8%)	23 (15.5%)	148 (100%)	
	Medium burnout	13 (13.0%)	59 (59.0%)	4 (4.0%)	6 (6.0%)	18 (18.0%)	100 (100%)	
	Severe burnout	2 (18.2%)	3 (27.3%)	0 (0.0%)	3 (27.3%)	3 (27.3%)	11 (100%)	
Resilience	Low	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (100%)	1 (100%)	$p \leq 0.05$
	Medium	41 (17.7%)	112 (48.3%)	15 (6.5%)	27 (11.6%)	37 (15.9%)	232 (100%)	
	High	17 (9.3%)	92 (50.5%)	23 (12.6%)	20 (11.0%)	30 (16.5%)	182 (100%)	

NP not practice, *INCS* individual non-contact sport, *ISWC* individual sport with contact, *CS* contactless collective sports, *CSWC* collective sport with contact

effective in controlling stress levels and promoting motivation and satisfaction in teachers [18, 19].

The practice of a physical-sports activity is associated with the resilience process, being greater in those subjects who perform it and those who opt for individual sports with contact. Similar data to those obtained by Hegberg and Tone [51] and Laborde et al. [20] which confirm that sports practice promotes the development of multiple capacities, such as optimism, emotional intelligence, facing adverse situations or motivation to improve in situations of disadvantage. In this sense, with the practice of physical-sports activity, specific situations will be experienced, which will favor the development of resilient capacity [52, 53].

Specifically, the high levels of stress were related to the subjects who did not practice any type of sport or those who opted for the individual ones without contact. Similarly, it happens with those who present a severe burnout, being teachers who perform individual sports without contact, collective sports without and with contact, the most likely to

manifest this pathology. Normally, exhaustion is the result of the work stress of teachers and at this point is where physical activity acts as a tool for stress reduction [46]. Although some studies show that there are no associations in all teaching populations [54] as pointed out by Obando-Mejía et al. [55] the practice of physical activity contributes favorably to the reduction of stressful processes [18]. Similarly, Ramón-Suárez et al. [56] and Reynada-Estrada et al. [57] state that the practice of this reduces negative social behaviors, as well as the improvement of emotional intelligence [58]. For this reason, and under the need to overcome adversity, high levels of resilience were associated with subjects who perform individual sports without contact and group sports with contact.

The present study was not without limitations, the study design is descriptive and cross-sectional with the isolated measurement of a group. It would be interesting if future studies approach this line of research from different measurement points and thus be able to establish cause-effect

relationships and follow-up of the participants. The study sample was specific to a teaching area and should not be generalized to the other specialties. Also, as a perspective for future lines of research, a more detailed analysis of physical activity is proposed and even that can be measured with valid and reliable tools.

Conclusions

The subjects who did not comply with the minimum recommendations for practicing physical activity or sports modality showed greater stress and emotional exhaustion. While physical activity was associated with fewer signs of burnout syndrome and greater capacity for self-improvement. Thus, teachers who opt for individual non-contact sports presented greater stress and signs of burnout, which is why these sports modalities were associated with greater resilience. For this reason, physical activity can act as a preventive means of stress and burnout syndrome, as well as favoring the capacity for personal improvement. The findings suggest the use of strategies for practicing physical activity based on the WHO [21] recommendations for the prevention of work stress and burnout syndrome in teachers, as well as to overcome work adversities.

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Declarations

Conflict of interest None of the authors has a conflict of interest to declare, and all authors were involved in the study design, data collection and interpretation, and contributed to the writing of the manuscript. This manuscript is not currently being considered for publication by another journal.

Ethical approval The present research has followed at all times the principles of the Declaration of Helsinki, guaranteeing at all times the rights of the participants. Likewise, the present study has been approved and supervised by an ethics committee of the University of Granada (1230/CEIH/2020).

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