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Presenteeism in Brazilian Universities: Psychometric Properties of Assessment Instruments

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Abstract

Presenteeism represents a phenomenon that occurs when people are physically present in the workplace but are functionally absent. The aims of this study were to estimate the presenteeism in university professors and administrative personnel of Brazilian public universities and to evaluate the psychometric properties of presenteeism instruments in the sample. The evaluation of presenteeism was carried out using the Work Limitation questionnaire (WLQ) and the Stanford Presenteeism scale (SPS-6). The psychometric properties of the instruments were analyzed using c onfirmatory factor analysis (CFA). A total of 533 workers participated in the study (271 academic staff members and 262 university professors). The presenteeism index in the sample was .05. The CFA of the refined models showed adequate adjustments to the sample. However, the analysis of the explained variance of the presenteeism concept revealed strong contribution of the WLQ factors and the theoretical fragility of the SPS-6. The results provided evidence of the validity and reliability of the WLQ for the assessment of presenteeism in Brazilian university workers.

Keywords: occupational health, presenteeism, psychometrics.

Presenteímo em Universidades Brasileiras: Propriedades Psicométricas de Instrumentos de Avaliação

Resumo

O presenteísmo representa um fenômeno que ocorre quando as pessoas estão fisicamente presentes no local de trabalho, mas estão funcionalmente ausentes. Os objetivos desse estudo foram estimar o presenteísmo em professores e trabalhadores administrativos de universidades brasileiras e avaliar as propriedades psicométricas de instrumentos de presenteísmo na amostra. A avaliação do presenteísmo foi realizada por meio do *Work Limitation Questionnaire* (WLQ) e da *Stanford Presenteeism Scale* (SPS-6). As propriedades psicométricas dos instrumentos foram analisadas por meio da Análise Fatorial Confirmatória (AFC). Um total de 533 trabalhadores participaram do estudo (271 membros da equipe acadêmica e 262 professores universitários). O índice de presenteísmo na amostra foi de 0,05. A AFC dos modelos refinados mostrou ajustes adequados à amostra. No entanto, a análise da variância explicada do conceito de presenteísmo revelou forte contribuição dos fatores do WLQ e a fragilidade teórica do SPS-6. Os resultados forneceram evidências da validade e confiabilidade do WLQ para a avaliação do presenteísmo em trabalhadores de universidades brasileiras.

Palavras-chave: saúde ocupacional, presenteísmo, psicometria.

Presenteismo en Universidades Brasileñas: Propiedades Psicométricas de Instrumentos de Evaluación

Resumen

El presentismo representa un fenómeno que ocurre cuando las personas están físicamente presentes en el lugar de trabajo pero están funcionalmente ausentes. Los objetivos de este estudio fueron estimar el presentismo en una muestra de profesores y personal administrativo de universidades brasileñas y evaluar las propiedades psicométricas de los instrumentos de presentismo en la muestra. La evaluación del presentismo se realizó mediante el *Work Limitation Questionnaire* (WLQ) y la *Stanford Presenteeism Scale* (SPS-6). Las propiedades psicométricas de los instrumentos fueron analizadas mediante Análisis Factorial Confirmatorio (AFC). Participaron en el estudio 533 trabajadores (262 profesores universitarios y 271 miembros del equipo académico). El índice de presentismo en la muestra fue del 0,5. El AFC de los modelos refinados mostró ajustes adecuados a la muestra. Sin embargo, el análisis de varianza explicada del concepto de presentismo reveló una fuerte contribución de los factores WLQ y la debilidad teórica del SPS-6. Los resultados evidenciaron la validez y confiabilidad del WLQ para la evaluación del presentismo en trabajadores de universidades brasileñas.

Palabras clave: salud ocupacional, presentismo, psicometría.

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Presenteeism has been outstanding in recent decades due to the global economic recession, the changing world of work and the consequent productive restructuring process. The concept of presenteeism was proposed by the psychologist Cary Cooper in the 1990s as a phenomenon that occurs when people are physically present in the workplace but are functionally absent (Cooper & Lu, 2016). Researchers in general agree the presenteeism refers to the physical presence of the individual in the workplace with some health problem which can cause serious consequences to health and well-being of workers and lead to productivity loss (Dirzyte et al., 2021; Johns, 2010; Lohaus & Habermann, 2019; Lu et al., 2021; Pohling et al., 2016). For this reason, presenteeism represents a silent and significant phenomenon that can costs to organizations more than absenteeism (Noben et al., 2014; Ospina et al., 2015).

According to the theoretical assumptions of Johns (2010), the causes of presenteeism can be divided into three groups: (1) organizational policies, (2) job design features, and (3) presenteeism cultures. Organizational policies concerning pay, attendance control, downsizing, and permanency of employment. Job design features include job demands, adjustment latitude, ease of replacement, and teamwork (Johns, 2010). Presenteeism and absenteeism cultures have been conceptualized as influencing attendance behavior, understood as the behavior of attending or not attending work (Johns, 2010; Ruhle & Süß, 2019).

Besides, the complex interactions between individual aspects and contextual factors have been relevant for the attendance behavior and can influence the presenteeism and the absenteeism (Ruhle & Süß, 2019). The individual determinants of presenteeism have been considered health problems (physical, emotional, psychological), attitudinal and psychological factors, personality, work attitudes, family life and conflicts, financial situation (Gosselin et al., 2013; Johns, 2010; Kinman & Wray, 2018; Lohaus & Habermann, 2019).

Previous research has suggested a range of organizational and work-related factors of presenteeism including absence management policies, availability of replacement, competitive workplace culture, limited promotion prospects and reward system, job insecurity, temporary employment, lack of social support, high level of work-related stress (e.g. high workload, time pressure, lack of autonomy and control at work, understaffing) (Deery et al., 2014; Gosselin et al., 2013; Kinman & Wray, 2018; Lohaus & Habermann, 2019; Miraglia & Kinman, 2017; Miraglia & Johns, 2016; Nordenmark et al., 2019; Pohling et al., 2016).

The work-related aspects that require constant physical, emotional or cognitive effort are classified as work demands (Job Demand-Resources Theory, JD-R) and can determine not only the presenteeism but the workers' illness (Bakker & Demerouti, 2017).

Studies developed by the Health and Safety Executive of the United Kingdom indicated that work in universities has become more demanding and diversified due to the exponential increase in the number of students and the need for financial self-sufficiency of these institutions, which have started to seek greater efficiency and educational quality (Gail Kinman, 2014). Consequently, the work-related stress has increased exponentially in British higher education institutions, causing serious implications for the health and well-being of workers (Kinman & Wray, 2014). Similarly, Brazilian universities have been facing a serious crisis, characterized by the degradation of working conditions due to the increase in the number of students, the decrease in the number of professors and the increase in demands related to productivity (Lemos, 2011).

In addition to teaching classes, professors from higher education units must develop multiple activities related to teaching, research and university extension and perform administrative tasks, meeting the requirements of scientific production (Carlotto & Câmara, 2017). Thus, work in universities requires the organization of departments and collegiate bodies, the planning of academic activities, the management of courses and the relationship with university students (Sestili et al., 2018). These high demands represent the intensification and workloads of university professors and are consequences of a meritocratic system that often exceeds the limits of physical and mental health (Lemos, 2011). In addition, the combined effect of responding to job demands with the progressive degradation of working conditions in universities around the world can result in the physical and emotional exhaustion of these professionals (Collado et al., 2016; Van Nhung, 2021).

Regarding the assessment of presenteeism, scientific evidence have presented more than 21 instruments used to evaluate absenteeism/presenteeism (Lohaus & Habermann, 2019; Ospina et al., 2015). Among the most used instrument worldwide, the Work Limitation Questionnaire – WLQ and the Stanford Presenteeism Scale – SPS-6 were identified.

The WLQ has been used to assess work disability related to different health conditions (Brick et al., 2019; Chow et al., 2021; Ishibashi & Shimura, 2020; Keysor et al., 2018; Nazari et al., 2020) presenting adequate reliability and validity (ŞAHİN et al., 2021; Tang et al., 2013; Walker et al., 2017) as well as the SPS-6 (Baldonedo-Mosteiro et al., 2020; Ferreira et al., 2021; Fiorini et al., 2020; Mokhtar et al., 2020; Neto & Guimarães, 2021; PÉREZ-NEBRA et al., 2020), used to assess how a worker's health status can affect their work activities.

Therefore, the aims of this study were i.to estimate the presenteeism in a sample of university professors and administrative/academic staff members of Brazilian public universities and ii.to evaluate the psychometric properties of presenteeism scales in the sample.

Methods

Study design and sample

This is a cross-sectional study with non-probabilistic sampling method. The population was represented by professors of undergraduate courses and by technical-administrative workers of public Universities of São Paulo State, Brazil. To estimate the minimum sample size it was considered the recommendation of 5-10 subjects per parameter to be estimated by the model (Hair et al., 2005).

Inclusion criterion

Considering presenteeism as a phenomenon related to the occurrence of health problems, workers who reported having health problems were included in the sample only. Therefore, 533 workers declared to have some health problem and voluntarily agreed to participate in this study.

Instruments

A demographic questionnaire was used to obtain information related to the workers' gender, age, position at work, duration of employment at the universities, and hours

worked per week. To the assessment of presenteeism, the Brazilian version of the Work Limitation Questionnaire – WLQ (De Soárez et al., 2007) and the Stanford Presenteeism Scale – SPS-6 (Paschoalin et al., 2013) were used.

The WLQ framework assumes a dynamic interaction among job demands, characteristics of the person exposed to the demands, and the social contexts (Lerner et al., 2001 2001). It consists of 25 items divided into 4 subscales: time management (TM), physical demands (PD), mental-interpersonal demands (MI), and output demands (OD). Possible responses of the WLQ represents a five-point Likert scale ranging from difficult all of the time (100%) to difficult none of the time (0%) (Lerner et al., 2017). The instruction of the physical demands' subscale is reversed. So, the original authors advise to invert the scores of the WLQ response scale of the items 1-5 and 12-25 when analyzing the results.

The Stanford Presenteeism Scale – SPS-6 evaluates the individual's ability to concentrate and to perform work activities despite health problems and it was developed with 32 items initially. However, the authors have already proposed the reduced version of 6 items (SPS-6) based on its adequate psychometric properties (Koopman et al., 2002). The structure of the scale integrates two dimensions of presenteeism: completed work (CW) and avoided distraction (AD). The SPS-6 is rated on a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The items 1, 3 and 4 are reverse-scored in accordance with the negative wording and the numeric value of the responses must be flipped to its mirror image.

Data Collection and Analysis

To data collection, an online-based survey was developed and participants were recruited via email between June 2018 to January 2019. A total of 8,400 emails were sent to professors and academic staff members of universities of São Paulo State, Brazil, and the sample was composed by 533 participants.

The prevalence of presenteeism in the sample was analyzed by estimating the overall scores of WLQ factors. It was followed the recommendations of the original authors (Lerner et al., 2001). After, the scores were compared to demographic and occupational variables (age, gender, position at work, weekly workload, and health problems declared by participants) in order to evaluate factors that contribute to presenteeism in the sample.

For data analysis, descriptive statistics were used to describe study participants' characteristics. The psychometric properties of the WLQ and the SPS-6 were analyzed by estimating the factorial, convergent, discriminant and concurrent construct validity; the factorial invariance of the models; and the reliability (Fornell & Larcker, 1981).

Factorial validity was performed using Confirmatory Factor Analysis (CFA) with the maximum likelihood (ML) estimation method. To evaluate the model fit, several indices were including ratio of chi-square and degrees of freedom (x^2/df; values ≤ 2.0 are acceptable), comparative fit index (CFI) and Tucker-Lewis index (TLI) ≥ .90; root mean square error of approximation (RMSEA) ≤ .10 (Bentler, 1990; Tanaka & Huba, 1985). The factor loadings (λ) of the items were considered acceptable when ≥ .50 (Bentler, 1990).

To evaluate the convergent validity of items for each WLQ and SPS-6 subscale, the average variance extracted (AVE) was estimated (values ≥ .50 indicate satisfactory convergent validity). Discriminant validity was accepted when AVE for each factor was larger than the squared Pearson correlation between the two factors (AVEi and AVEj ≥ ρ_{ij}^2) (Fornell & Larcker, 1981).

Factorial invariance between independent samples for each instrument was evaluated to verify the external validity of the obtained factorial solution using multi-group cross-validation analysis and the chi-square difference statistical test (Δx^2). For this purpose, the sample was randomly divided into two independent samples (test sample: n = 273; validation sample: n = 260). To evaluate invariance, the factorial loadings (λ), intercepts (I), and residues variance/covariance (Cov) of the two samples were analyzed. When $p\Delta x^2_{\lambda}$ was > .05, weak invariance (metric) was found; if $p\Delta x^2_{\lambda}$ and $p\Delta x^2_{i}$ were > .05 (metric and scalar invariance) or $p\Delta x^2_{\lambda}$, $p\Delta x^2_{i}$ and $p\Delta x^2_{cov}$ were > .05 (metric, scalar, and strict invariance), strong invariance was found (Fornell & Larcker, 1981).

The reliability of the items was estimated using Cronbach's α and Composite Reliability (CR). Values of α and CR higher than .70 indicate acceptable reliability (Fornell & Larcker, 1981). As a complementary procedure, the concurrent validity was verified by analyzing the Pearson correlation between the WLQ and the SPS-6 factors.

In order to evaluate the contribution of the WLQ and the SPS-6 factors to the construct of presenteeism, a second-order hierarchical model (SOHM) was also tested, with presenteeism as the second order factor. It was hypothesized that the concept of presenteeism as a second-order factor could be reflected in the first-order factors of two presenteeism inventories: WLQ (TM, PD, MI and OD) and SPS-6 (AD and CW).

Statistical analyses were performed using IBM SPSS Statistics 22 (IBM Corp., Armonk, N.Y., USA) and AMOS 22.0 (IBM Corp., Armonk, N.Y., USA) software. The present study was approved by the Brazilian Research Ethics Committee and informed consent was obtained from all participants (CAEE 80459417.9.0000.5393).

Results

The sample's demographic data showed the mean age was 48.10 years (SD = 9.58); 315 (59.10%) participants were women; 271 (50.84%) were academic/administrative staff members. About the duration of employment, 325 (60.98%) participants worked for up to 20 years in the universities, and 508 (95.31%) of the sample worked full time or 40 hours per week.

The CFA of the WLQ showed an adequate overall fit to the sample (χ^2/df = 4.33; CFI = .94; TLI = .93; RMSEA = .08). However, the modification indices showed strong correlations between the errors e19 – e20 (LM = 124.08) and e18 – e20 (LM = 119.68). So, it was decided to exclude the items 18 and 20. The refined model resulted in a four-factor model with 23 items, which good factorial loadings (λ) ≥ .65; adequate overall fit (χ^2/df = 3.53; CFI = .96; TLI = .95; RMSEA = .07); strong correlations between the dimensions TM, MI and OD [$r_{(TMXOD)}$ = .89; $r_{(TMXMI)}$ = .86; $r_{(ODXMI)}$ = .90] and weak correlations between the dimensions PD and the other WLQ factors [$r_{(PDXTM)}$ = .09; $r_{(PDXMI)}$ = .09; $r_{(PDXOD)}$ = .12]. All correlations were significant (p < .001).

Regarding the convergent validity, the WLQ factors presented adequate AVE [$AVE_{(TM)}$ = .76; $AVE_{(PD)}$ = .85; $AVE_{(MI)}$ = .73; $AVE_{(OD)}$ = .74] and it was observed discriminant validity between the factors $AVE_{(PD)}$ and $AVE_{(TM)}$ (r^2 = .01), $AVE_{(PD)}$ and $AVE_{(MI)}$ (r^2 = .01) e $AVE_{(PD)}$ and $AVE_{(OD)}$ (r^2 = .01). However, it was not observed discriminant validity between $AVE_{(MI)}$ and $AVE_{(OD)}$ (r^2 = .81), $AVE_{(MI)}$ and $AVE_{(TM)}$ (r^2 = .74) and $AVE_{(TM)}$

and $AVE_{(OD)}$ (r^2 = .79), which is justified by the high correlation between the factors MI, OD and TM.

It was also verified adequate reliability of the WLQ domains [$CR_{(TM)}$=0.92; $CR_{(PD)}$ = .97; $CR_{(MI)}$ = .93; $CR_{(OD)}$ = .91 and $\alpha_{(TM)}$ = .94; $\alpha_{(PD)}$ = .97; $\alpha_{(MI)}$ = .95; $\alpha_{(OD)}$ = .93], proving the internal consistency of the WLQ for the sample.

Regarding the factorial invariance of the refined model of the WLQ in independent samples (test n = 273; validation n = 260), simultaneous analysis showed the goodness of model fit (χ^2/df = 2.67; CFI = .95; TLI = .94; RMSEA = .06) and the metric and scalar invariance of the model (*strong invariance*) (λ: Δx^2 = 21.987, p = .285; I: Δx^2 = 11.181, p = .981; Cov: Δx^2 = 23.917, p = .008; Residual: Δx^2 = 63.574; p < .001). Therefore, the stability of the proposed factorial structure was confirmed.

About the SPS-6 analysis, the CFA showed an acceptable overall fit to the sample (χ^2/df = 5.75; CFI = .97; TLI = .94; RMSEA = .09). It was verified the item 2 presented λ = .56 and that, although originally belonging to the factor CW, this item presented correlation with the domain AD (LM = 28.22). Thus, the item was excluded, resulting in a goodness of model fit (χ^2/df = 1.37; CFI = 1.00; TLI = 1.00; RMSEA = .03). However, the bifactorial model was composed by 5 items, revealing that the exclusion of items can cause the theoretical fragility of the SPS-6.

The refined model showed λ > .70 and weak correlation between the domains CW and AD [$r_{(CWXAD)}$ = .23, p < .001]. It was observed adequate convergent validity between the domains [$AVE_{(CW)}$ = .64; $AVE_{(AD)}$ = .67] and discriminant validity between the $AVE_{(CW)}$ and $AVE_{(AD)}$ (r^2 = .05). Moreover, it was attested adequate internal consistency of the SPS-6 factors [$CR_{(CW)}$ = .77; $CR_{(AD)}$ = .73; $\alpha_{(CW)}$ = .80; $\alpha_{(AD)}$ = .83].

The simultaneous analysis of the factorial invariance of the refined SPS-6 model in independent samples (test n = 273; validation n = 260) showed an excellent goodness of model fit (χ^2/df = .79; CFI = 1.00; TLI = 1.00; RMSEA = .00) and revealed no significant differences between the samples (λ: Δx^2 = 1.066, p = .785; I: Δx^2 = 7.658, p = .176; Cov: Δx^2 = 10.748, p = .013; Residual: Δx^2 = 2.362; p = .797), that is, the strong invariance of the proposed factorial structure. The CFA, convergent validity, and reliability of the WLQ and the SPS-6 to different samples are presented in Table 1.

The SOHM with presenteeism as the second order factor and the WLQ and the SPS-6 factors as sub constructs is presented in Figure 1. The CFA of the SOHM showed the goodness of model fit (χ^2/gl = 2.77; CFI = .96; TLI = .96; RMSEA = .06); the items presented λ ≥ .65 and all the factors were significant for the general concept of presenteeism (p < .001). It was verified a strong contribution of the WLQ factors OD, MI and TM and moderate and negative contribution of the SPS-6 factors CW (β = -.34) and AD (β = -.61) to the presenteeism.

However, the explained variance of the concept of presenteeism (.28) did not change after eliminating the SPS-6 factors (CW and AD) from the SOHM. Because of this and considering the theoretical fragility of the SPS-6, it was decided to exclude the instrument for calculating the prevalence of presenteeism in the sample.

The Figure 2 presents the CFA of the SOHM with presenteeism as the second order factor and the WLQ factors as sub constructs (without the SPS-6). The SOHM showed an adequate fit to the data (χ^2/df = 3.51; CFI = .96; TLI = .96; RMSEA = .07); factorial loadings (λ) ≥ .65; strong contribution of the factors OD (β = .96, p < .001), MI (β = .93, p < .001) and TM (β = .93, p < .001) to the concept of presenteeism. Conversely, it was observed that presenteeism explained only 1% of the variance of the factor DF (β = .11, p = .016).

The concurrent validity of presenteeism instruments (WLQ and SPS-6) is presented in Table 2. The Table 2 showed a significant correlation (p < 0.01) between all the WLQ and the SPS-6 factors and the construct of presenteeism, except for the correlation between PD and CW, which proves the concurrent validity of the instruments. It was observed the SPS-6 AD and CW factors presented negative and weaker correlations with the presenteeism when compared to the WLQ factors.

The comparison of the overall weighted scores of the factors TM, PD, MI and OD, and presenteeism (SOHM) between gender and function did not present statistically significant differences, as well as the correlation between the factors and worked hours per week.

Regarding the prevalence of presenteeism, the guideline of the WLQ original version authors was followed (Lerner et al., 2001) to calculate the overall score of the instrument domains to the sample (Table 3). The Table 3 showed the PD domain presented the highest indexes, which were much higher than the other WLQ factors. Highlight PD factor has items with inverted response scale in relation to the others. Regarding the overall WLQ score, WLQ Index = .05 was observed, which means that the rate of lost work productivity (WLQ Productivity Lost) due to health problems among participants was 5.23%.

Table 1

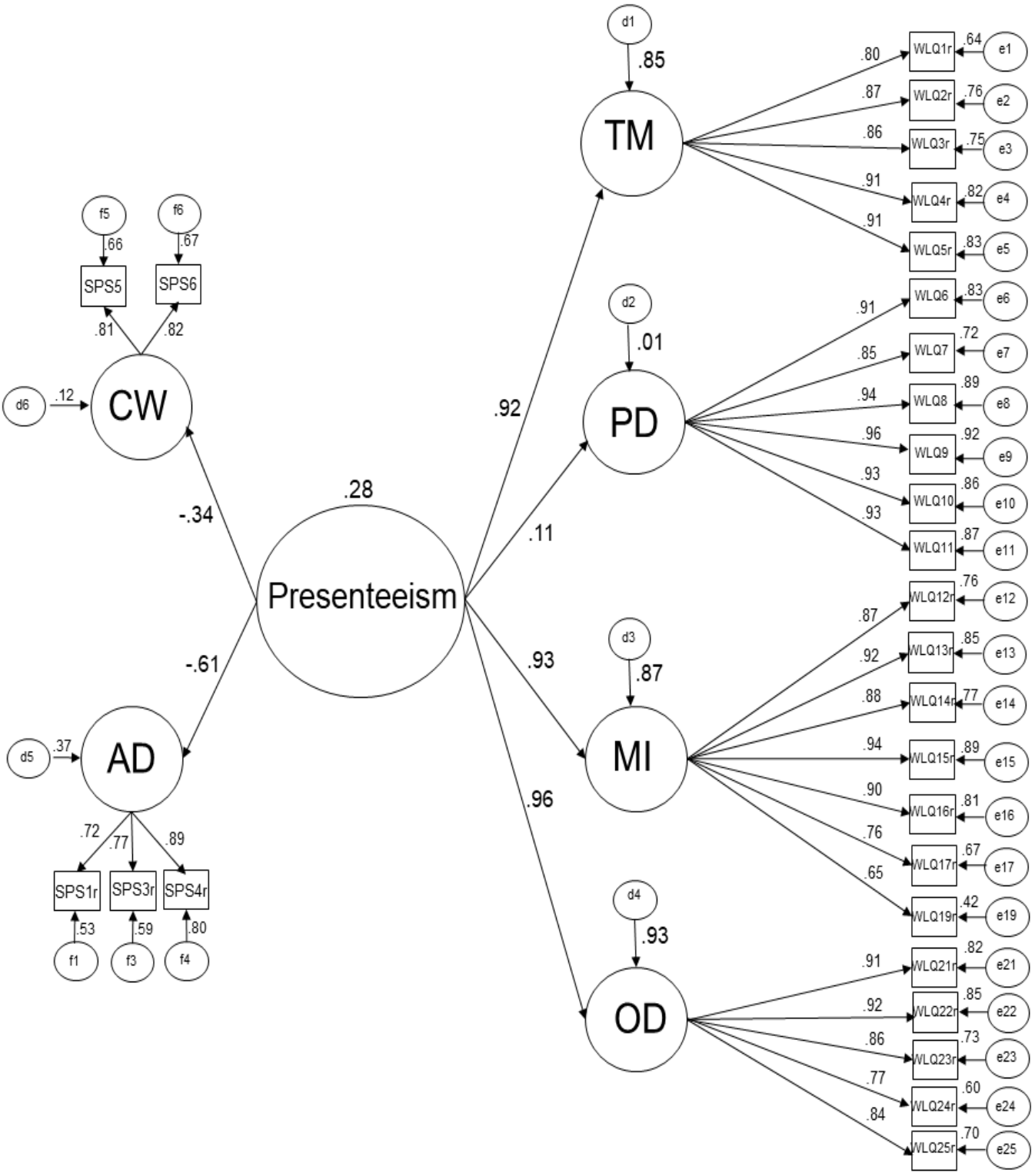
Confirmatory Factor Analysis, Convergent Validity and Reliability of the WLQ and the SPS-6 to different samples

Factorial Models		CFA						Reliability	
	n	λ	χ^2/df	CFI	TLI	RMSEA	AVE	CR	α
WLQ	533	.60 – .96	4.35	.94	.93	.08	-	-	-
WLQ refined	533	.65 – .96	3.53	.96	.95	.07	.73 – .85	.91 – .97	.93 – .97
WLQ SOHM	533	.65 – .96	3.50	.96	.96	.07	-	-	-
WLQ test	273	.68 – .96	2.67	.95	.94	.06	-	-	-
WLQ validation	260	.68 – .96	2.67	.95	.94	.06			
SPS-6	533	.56 – .91	5.75	.97	.94	.09	-	-	-
SPS-6 refined	533	.71 – .91	1.37	1.00	1.00	.03	.64 – .67	.73 – .77	.80 – .83
SPS-6 test	273	.71 – .89	0.79	1.00	1.00	.00	-	-	-
SPS-6 validation	260	.71 – .89	0.79	1.00	1.00	.00	-	-	-

Note. WLQ: Work Limitations Questionnaire; SPS-6: Stanford Presenteeism Scale; SOHM: second-order hierarchical model; λ: factorial loadings; x2/*df*: chi-square by degrees of freedom; CFI: comparative fit index; TLI: Turkey-Lewis index; RMSEA: root mean square error of approximation; AVE: average variance extracted; CR: composite reliability; α: Cronbach's alpha coefficient.

Figure 1

Confirmatory Factor Analysis of the second-order hierarchical model with presenteeism as the second order factor and the WLQ and the SPS-6 factors as sub constructs



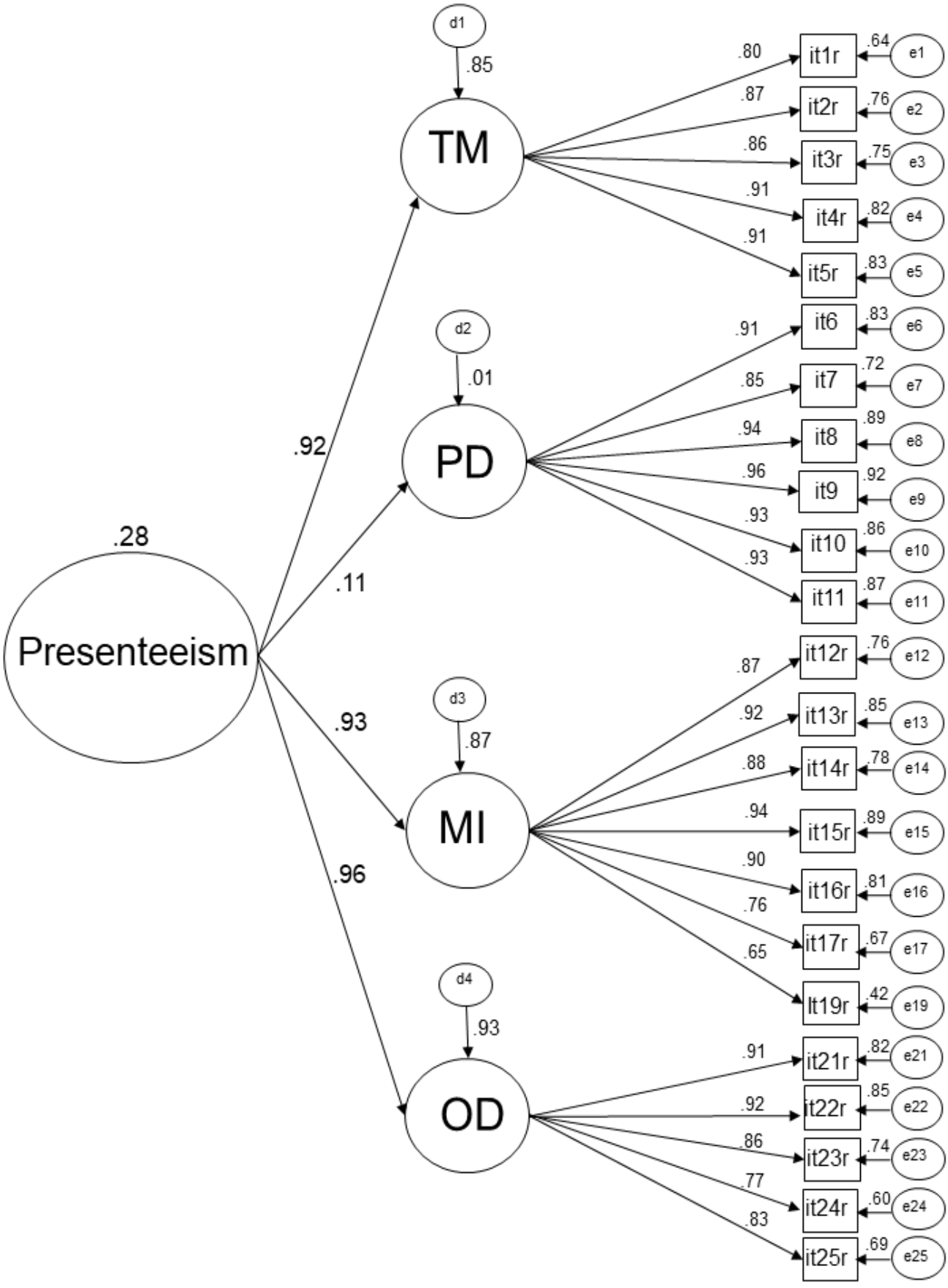
Discussion

The analysis of the WLQ validity revealed the refined model presented adequate adjustment quality indices for the sample. It was composed by 23 items after the exclusion of items 18 and 20. Weak correlations were observed between the physical demands (PD) and the other domains of the instrument. The SOHM (considering the presenteeism as the central construct) showed a weak and significant trajectory (β) of PD in relation to the presenteeism.

Problems related to the dimension PD have also been reported in other studies (Lu et al., 2021; Tamminga et al., 2014; Tang et al., 2013). The authors identified factorial models similar to the adjusted model in this study and considered the weak correlations involving the PD domain were due to the inversion of the response scale of the items of this factor. It is considered that, as the other WLQ items have the same sense, a pattern or stereotype of answers is created in the instrument. If the change in this pattern is not noticed, the participants maintain the previous sense of response (Taloyan et al., 2012).

Figure 2

Confirmatory Factor Analysis of the WLQ second-order hierarchical model



According to the theoretical assumptions that supported the construction of the WLQ, physical demands represent important determinants of workers' wear and illness, contributing to presenteeism and exhaustion of individuals. Therefore, even with low correlations with other WLQ factors, the physical demands domain was maintained in this study.

The WLQ convergent validity revealed an adequate AVE of the factors. However, the strong correlation between the

Table 2

Concurrent validity of WLQ and SPS-6 factors and the presenteeism.

Factors		WLQ				SPS-6		Presenteeism
		TM	PD	MI	OD	AD	CW	
WLQ	TM	1						
	PD	0.09*	1					
	MI	0.89**	0.10*	1				
	OD	0.92**	0.12**	0.93**	1			
SPS-6	AD	-0.54**	-0.16**	-0.53**	-0.54**	1		
	CW	-0.30**	0.01	-0.30**	-0.31**	0.26**	1	
Presenteeism		0.95**	0.12**	0.96**	0.97**	-0.65**	-0.36**	1

Note. The correlation is significant at the level *$p \leq .01$ and **$p < .05$; WLQ: Work Limitations Questionnaire; SPS-6: Stanford Presenteeism Scale; TM: time management; PD: physical demands; MI: mental-interpersonal demands; OD: output demands; AD: avoid distraction; CW: completed work.

Table 3

Overall score of the WLQ domains

WLQ	Mean	WLQ domain	WLQ Index	WLQ Productivity loss
TM	1.57	13.97	.05	5.23%
PD	2.73	43.81		
MI	1.63	15.81		
OD	1.62	15.16		

Note. WLQ: Work Limitations Questionnaire. TM: time management; PD: physical demands; MI: mental-interpersonal demands; OD: output demands.

factors MI, OD and TM attesting the discriminant validity of the proposed model, which was also verified in previous studies (Kono et al., 2014; Tamminga et al., 2014). It can be explained from the relationship between the psychological demands at work and the constant pressures suffered by the workers in the workplace related to time-related requirements and productivity at work. High physical, mental or psychological job demands require excessive individual effort and become stressors. In cases of prolonged exposure, they can cause negative results to workers' health, such as wear and illness, precursors of presenteeism and exhaustion (Job Demand-Resources Theory, JD-R) (Bakker & Demerouti, 2017).

Analyzing the reliability of the WLQ, the internal consistency of the instrument for the sample was proved. In addition, the model's strong measurement invariance in independent samples confirmed the stability of the proposed WLQ factorial structure.

The results also showed presenteeism was determined mainly by other demands, followed by mental-interpersonal factors and time management in the sample. It means that the productivity-related demands were the workloads that most contributed to the occurrence of the presenteeism, followed by psychological and mental demands required by the universities and by work-related time requirements (Collado et al., 2016; Sestili et al., 2018; Van Nhung, 2021).

In relation to the validity of the SPS-6, the initial model showed low factor loading of item 2 and correlation of this item with the ED domain. After excluding the item, the adjusted model presented adequate convergent and discriminant validity and reliability for the sample. A strong measurement invariance of the model was observed in independent samples, confirming the stability of the proposed factorial structure. However, weaknesses related to the theoretical model of this instrument and the validation process were observed.

For the SPS-6 validation, the authors used robust methods of construct, criterion and reliability analysis (Koopman et al., 2002). However, although reporting the purpose of the SPS-6 is to evaluate cognitive, emotional and behavioral aspects related to the performance at work by individuals with health problems, the authors did not present any theoretical assumption capable of justifying the instrument's model. The researchers only mention that the theoretical development of the SPS-6 was based on an extensive literature review and on the experience of the group. This lack of consistent theoretical assumptions of the SPS-6 model can cause problems related to the distribution of items, as verified with the item 2. This item, theoretically pertaining to the CW domain, presented low factor loading and significant correlation with the AD domain, being excluded. However, the exclusion of the item meant that the SPS-6 factorial structure for the sample consisted of two factors and only five items, which has been controversial (Hair et al., 2005).

The theoretical fragility of SPS-6 and the results obtained through the CFA were decisive for the exclusion of SPS-6 from the proposed final structural model and to estimate the presenteeism prevalence in the sample, performed only with the WLQ. In addition, the scarcity of studies that prove the factorial validity of SPS-6 does not allow the comparison of results (Frauendorf et al., 2014; Ospina et al., 2015; Paschoalin et al., 2013). In these studies, the reliability was just estimated using Cronbach's alpha value and the validity was tested through the analysis of correlation coefficients between SPS-6 factors and other psychometric instruments.

In addition, the validity of the concurrent construct between the instruments was verified. Once more, it was attested a low correlation between the PD domain and presenteeism and between AD and CW domains and presenteeism. This analysis reinforced the strong contribution of the TM, MI and OD domains for the construct of presenteeism and the WLQ as the main instrument for evaluating this phenomenon among the participants of this study.

About the prevalence of presenteeism in the sample, the rates of presenteeism and productivity loss at work were about 5%. However, the results confirm that the presenteeism represents a phenomenon determined by the interaction of physical, mental, interpersonal, and organizational demands in the workplace and stressors related to the personal lives of teachers and technical-administrative workers.

The results provided evidences of the validity and the reliability of the WLQ to the assessment of presenteeism in Brazilian university professors and academic staff members. Furthermore, the WLQ proved to be an important tool for the diagnosis of organizational factors related to workers' health and to the improvement of health promotion at work.

Limitations of this study were the cross-sectional design, which does not allow the establishment of causal effects in relation to the presenteeism; the use of non-probabilistic sampling method and the impossibility of including a larger number of universities in the study, aspects that hinder the generalization of the results.

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