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Perceived coworkers' work addiction: Scale development and associations with one's own workaholism, job stress, and job satisfaction in 85 cultures

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FULL-LENGTH REPORT



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ABSTRACT

Background: While the empirical data on the role of environmental factors in work addiction (WA) is steadily growing, little is known about the extent to which the workaholic environment contributes to the increased risk of WA and what are the relative contributions of direct supervisor's and colleagues' WA to one's own workaholism. **Methods:** The Perceived Coworkers' Work Addiction Scale (PCWAS) assessing perceived direct supervisor's and colleagues' WA, defined as an addictive disorder, was

administered alongside measures of WA, job stress, and job satisfaction in a total sample of 33,222 employees from 85 cultures across six continents (63.2% females, mean age 39.35 years). *Results:* The PCWAS showed scalar measurement invariance between genders and job positions, and approximate measurement invariance across cultures. In most cultures, the perceived supervisor's and colleagues' WA correlated with one's own WA, job stress (positively), and job satisfaction (negatively). In structural equation models, perceived colleagues' rather than supervisor's WA was more strongly related to one's own WA and job stress in most cultures. *Discussion and conclusions:* These findings suggest that the PCWAS is valid and reliable for assessing the workaholic environment, and it can be used globally to provide comparable and generalizable results. The present study is the first to show that WA may considerably depend on environmental factors in different cultures worldwide and that perceived colleagues' WA may play a particularly important role in this context. These findings may guide organizational interventions to decrease WA risks among employees and improve their well-being and productivity.

KEYWORDS

assessment, job satisfaction, job stress, organizational factors, work addiction, workaholism

INTRODUCTION

Research in the field of work addiction (WA) has greatly increased in recent decades, significantly advancing the comprehension of this complex behavior. WA, also referred to as “workaholism” (see [Atroszko, 2024](#); [Morkevičiūtė & Endriulaitienė, 2023a](#)), is a compulsive and excessive behavior characterized by an uncontrollable need to work and an inability to disengage from work-related activities, often leading to negative consequences in personal and social life ([Andreassen, Griffiths, Sinha, Hetland, & Pallesen, 2016](#); [Atroszko, Demetrovics, & Griffiths, 2020](#); [Griffiths, Demetrovics, & Atroszko, 2018](#); [Oates, 1971](#)). Both individual and environmental risk factors contribute to WA ([Atroszko, Demetrovics, & Griffiths, 2019](#); [Griffiths & Karanika-Murray, 2012](#); [Sussman, 2012](#)). Regarding individual factors, personality traits, personal beliefs, and cognitions stand out, such as low global self-esteem, high perfectionism, compulsiveness, or rumination, as do emotions, including anxiety, depressive symptoms, and negative affect ([Andreassen et al., 2016](#); [Kun, Takacs, Richman, Griffiths, & Demetrovics, 2020](#); [Morkevičiūtė & Endriulaitienė, 2023a](#)). Additionally, motivations (both introjected and identified work motivations) and values associated with work, such as those instilled within one's family of origin, play an important role ([Kenyhercz, Frikker, Kalo, Demetrovics, & Kun, 2022](#); [Morkevičiūtė & Endriulaitienė, 2023a](#); [van Beek, Hu, Schaufeli, Taris, & Schreurs, 2012](#)). More recently, cognitive functions, such as poorer inhibitory control and complex working memory, have been recognized ([Berta et al., 2023](#)). Furthermore, underlying psychopathological problems, such

as attention deficit hyperactivity disorder (ADHD), may also contribute in a considerable number of cases ([Atroszko, 2022](#)).

Among the facilitating factors are also broader societal, cultural, and economic influences, so the country in which a person is born and lives can significantly affect WA prevalence. The studies using comparable screening methodology (the Bergen Work Addiction Scale (BWAS); [Andreassen, Griffiths, Hetland, & Pallesen, 2012](#)) showed that WA could be two to three times less common in countries with established economies and good social care (Norway, Denmark, Switzerland) than in post-communist and developing countries (Poland, Hungary, Turkey; see [Andersen, Djugum, Sjästad, & Pallesen, 2023](#)). However, there is a scarcity of directly comparable data stemming from representative samples using standardized screening tools that are cross-culturally invariant, which is paramount to uncovering the role of macro-level factors in WA.

Environmental factors in the workplace and in addiction

The immediate environmental factors within a workplace organization also wield significant influence on employees' WA ([Clark, Michel, Zhdanova, Pui, & Baltes, 2016](#)). When individuals join an organization, they bring with them their unique ways of functioning and interacting with the work environment. This environment, characterized by its culture, values, rules, expectations, and organizational climate, reciprocally affects how individuals operate and function within their workplace. Under certain conditions, WA can be exacerbated by factors within the work environment ([Clark, Michel, et al., 2016](#)). These may include excessively high or irrational expectations, insufficient rewards, role conflicts, destructive competition, power struggles, high job demands, or the promotion of an excessively strong organizational identity ([Andreassen, Nielsen, Pallesen, & Gjerstad, 2019](#); [Dutheil et al., 2020](#); [Holland, 2007](#); [Keller, Spurk, Baumeler, & Hirschi, 2016](#); [Schaeff & Fassel, 1988](#)). In organizations characterized by a “winner takes it all” mentality, commonly seen as “masculine,” the emergence of WA may be particularly pronounced ([Ng, Sorensen, & Feldman, 2007](#)).

Organizational factors, or meso-level factors ([Tóth-Király, Bóthe, & Orosz, 2018](#)), play a crucial role not only from an organizational psychology perspective but also within the framework of addictions in understanding WA. When it comes to addiction, environmental effects are just as significant as individual characteristics, including genetics and personality traits ([Kendler & Prescott, 2006](#)). Some researchers argue that the environment includes the most important risk factors, and they back it up with empirical support ([Alexander, 2012](#)). Just as in substance use disorders, where the environment (setting) is as critical as the individual (set), and the addictive substance (drug) itself ([Zinberg, 1984](#)), behavioral addictions such as WA require an environment that reinforces and facilitates addictive behavior. The work and organizational psychology literature

provides both increasingly integrated theoretical frameworks and accumulated empirical data for understanding the impacts of leaders and colleagues on employee engagement, functioning, and performance (Barsade, Coutifaris, & Pillemer, 2018; Deci, Olafsen, & Ryan, 2017; Decuyper et al., 2020; Pletzer, Breevaart, & Bakker, 2024).

The role of managers: Theoretical frameworks

Within the workplace environment, managers are responsible for organizational climate and culture. They influence employee behaviors and attitudes, including healthy engagement and harmful workaholism, via indirect and direct processes and various pathways (for an overview, see Decuyper et al., 2020). Leadership styles affect work characteristics (material pathway; Job Demands-Resources Theory, JD-R theory; Bakker, Demerouti, & Sanz-Vergel, 2023) and psychological need satisfaction (intrapersonal motivational pathway; Self-Determination Theory, SDT; Deci et al., 2017), indirectly affecting employee behaviors. Leaders' direct influence via interpersonal processes includes three pathways: emotional contagion (affective; Hatfield, Cacioppo, & Rapson, 1994; see Barsade et al., 2018), social exchange (cognitive; Social Exchange Theory, SET; Shore, Tetrick, Lynch, & Barksdale, 2006), and role modeling (behavioral; Social Learning Theory, SLT; Bandura, 1986). Consequently, workaholic managers may increase employees' WA risk by creating high job demands and low support (material pathway; Clark, Michel, et al., 2016), frustrating their basic needs of autonomy, competence, and relatedness (motivational pathway; Andreassen, Hetland, & Pallesen, 2010), inducing emotional states and behavioral attitudes such as a nervous and perfectionistic approach to task completion (affective pathway), creating pressure to exchange extreme work involvement (e.g., if the leader is working hard for an employee, an employee may feel obliged to work hard for the leader), and serving as a model to emulate, fostering excessive effort and intense competition among colleagues.

Destructive leadership theory suggests that leader behavior can range from pro- to anti-follower and pro- to anti-organization, making it either constructive or destructive (Einarsen et al., 2007). Constructive leaders prioritize their followers' well-being, motivation, and job satisfaction through supportive actions such as praise and care. In contrast, destructive leaders harm followers' well-being and satisfaction through behaviors such as bullying and manipulation. Recently, this theory has been integrated with the JD-R theory (Bakker et al., 2023; Pletzer et al., 2024), which states that leadership can be considered a higher-order job demand or job resource. It means that leaders can generate demands or resources by (i) being demands or resources themselves, (ii) creating other types of demands or resources, or (iii) influencing their allocation and impact on followers. Workaholic leaders tend to generate excessive demands on their followers and increase WA risk (Atroszko & Atroszko, 2020). Their influence may be direct or indirect via members of the team and their attitudes and behaviors.

The role of colleagues: Theoretical frameworks

Similarly, workaholic colleagues may increase the risk of WA by analogous processes and pathways as leaders, with a specific expression adjusted to their workplace role. For example, they may generate demands, limit resources, and frustrate basic needs within their capability associated with their organizational role. However, the direct processes may be particularly significant when it comes to colleagues. Contagion effects may be especially pronounced when most team members express similar emotional states and behavioral attitudes (Barsade et al., 2018). Moreover, colleagues who work hard may generate pressure to exchange equally hard work and may function as everpresent models to emulate, fostering excessive effort. Also, colleagues may mediate the impacts of the managers contributing to complex patterns of influence. For example, high job demands from the manager on one employee may affect the other employee via a contagion effect.

Factors associated with job demands and resources, such as colleagues' communication styles, workloads, work hours, and teamwork dynamics, might have impacts on WA (Clark, Michel, et al., 2016; Cossin, Thaon, & Lalanne, 2021). Research indicates that an overwork climate, where long hours and constant availability are expected, correlates with a higher risk of WA (Mazzetti, Schaufeli, & Guglielmi, 2014). This effect may be amplified if the individual already possesses vulnerabilities to pressures to work excessively hard (Clark, Michel, et al., 2016; Kun et al., 2020). For instance, perfectionist traits correlate particularly strongly with WA in environments characterized by overwork (Mazzetti et al., 2014). Moreover, individuals might select or remain in roles that reinforce this perfectionist and performance-driven mode of functioning over the long term, aligning with the suggestions of the Attraction-Selection-Attrition theory (Schneider, 1987).

Supervisors' role in work addiction: Previous studies

While the role of supervisors' WA and leadership behaviors in WA among employees has gained some attention in recent years (Atroszko & Atroszko, 2020; Clark, Stevens, Michel, & Zimmerman, 2016; Morkevičiūtė & Endriulaitienė, 2020), to date, the effects of supervisors' WA on employees' WA remains to be examined. Initial studies have shown that a supervisor's WA is positively associated with an employee's WA (Morkevičiūtė & Endriulaitienė, 2022, 2023a, 2023b, 2023c). Moreover, a systematic review reported that in terms of leadership behaviors, the most frequently studied effect concerns perceived leader's supporting behavior, and the results mostly show that it is inversely related to employee's WA (Morkevičiūtė & Endriulaitienė, 2020; see also Gillet et al., 2022).

A recent longitudinal study showed that family-supportive supervisor behaviors are negatively related to prospective WA, and they buffer the negative effects of workaholism on work-family conflicts and psychological detachment from work (Chang, Gao, Wu, & Lin, 2022). A longitudinal study reported that a leader's higher WA

predicts future work-life conflicts for employees (Dong, Zhang, Li, & Ren, 2022). Cross-sectional studies have shown a positive correlation between leader's WA and subordinates' psychological distress (Dong et al., 2024) and that supervisors' WA is positively related to subordinates' emotional exhaustion through increased perceived workload and interpersonal conflict, resulting in subordinates' turnover intention (Kim, Kang, Choi, & Sohn, 2020).

Colleagues role in work addiction: Previous studies

A recent systematic review and meta-analysis examined the associations between WA and the quality of social relationships, particularly in the workplace (Kenyhercz, Mervó, Lehel, Demetrovics, & Kun, 2024). The analysis found that WA had a weak but significant negative relationship with the quality of workplace relationships, including those with managers and co-workers. In terms of colleagues' behaviors, cohesion in the work team and the social community at work is negatively related to WA (Torpe, Lysfjord, & Midje, 2018). A negative correlation was found between WA and coworker support, and higher perceived support from colleagues predicts a lower level of WA (Caesens, Stinglhamber, & Luypaert, 2014; Schaufeli, Taris, & van Rhenen, 2008). A study on dyads of employees showed the crossover effects (meaning that the states experienced by one person affect the level of states of another person) of daily work engagement, particularly vigor and when frequently communicated, which is likely to be more visibly expressed than other engagement components, such as dedication and absorption (Bakker & Xanthopoulos, 2009). Similarly, workaholic behaviors may be expected to affect coworkers as they constitute a harmful counterpart for healthy work engagement and can be expressed and communicated analogously (cf. Bereznowski, Atroszko, & Konarski, 2023).

Findings regarding the correlation between leader-member exchange (LMX) and WA are mixed. While Shkoler, Rabenu, and Tziner (2017) did not find a correlation, a recent study showed that higher LMX was a significant predictor of lower WA (Xie et al., 2023). Moreover, working profiles characterized by higher WA showed less LMX (Gillet et al., 2022). It seems likely that leader-member dyad congruency in workaholic behaviors may be a potential moderator such that congruent dyads may reinforce the negative association between LMX and WA.

In sum, the extant research indicates that reduced support from coworkers, particularly from supervisors, coupled with increased conflicts, correlates with more pronounced symptoms of WA. The negative effects of leaders' WA on their subordinates and the workplace environment are theoretically analyzed within organizational (Clark, Stevens, et al., 2016) and clinical frameworks (Atroszko & Atroszko, 2020). Firstly, holding a managerial position is one of WA's most significant sociodemographic risk factors (Clark, Michel, et al., 2016). Secondly, organizational leaders directly impact employee well-being and are responsible for the organizational culture and climate. Destructive leadership theories integrated with

JR-D theory may explain the mechanisms involved in excessive demands and limited resources (Bakker et al., 2023; Pletzer et al., 2024). Thirdly, managers may be an essential contributor to WA and its consequences in organizations because organizational culture, climate, and employee well-being contribute to WA. The crucial question is to what extent work-addicted managers may be a risk factor for WA among employees and to what extent their impact is limited to other forms of harm to employees, organizations, and work recipients (clients, patients, customers, etc.). The existing data suggest a substantial contribution of work-addicted managers to employee harm in terms of chronic stress, mental and physical illness, and loss of productivity due to inefficient management (Atroszko & Atroszko, 2020). Their behavior can also influence subordinates by serving as a model to emulate, fostering intense competition among colleagues.

Managers experiencing WA may foster a climate of overworking, with profound consequences when considering the role of the environment in the etiology of addiction (Alexander, 2012). An overwork climate in an organization is not only associated with employee exhaustion and burnout but also with turnover intentions (Huml, Taylor, Dixon, & Graham, 2024; Lazauskaitė-Zabielskė, Urbanavičiūtė, & Žiedelis, 2023). Moreover, evidence suggests that overworking organizational environments contribute to long-term job strain among employees (Afota, Robert, & Vandenberghe, 2021). Concurrently, organizations offering inadequate support witness diminished employee job satisfaction (Ahmad, Barattucci, Ramayah, Ramaci, & Khalid, 2022; Schyns, van Veldhoven, & Wood, 2009). These consequences are pronounced in sustained adverse and stressful environmental circumstances. Studies examining substance use disorders and WA suggest that a highly stressful and overworking environment, even if transient, may elicit addiction symptoms among vulnerable individuals, contribute to severe outcomes such as health complications and even death, and cause long-term health and productivity issues that persist even after the environment changes (see Atroszko & Atroszko, 2020).

Aims of the present study and hypotheses

The primary objective of the present study, utilizing data from multiple cultures, was to explore the associations between perceived coworkers' WA and one's own WA, job stress, and job satisfaction. While direct attitudes and relationships between coworkers are likely important regulating mechanisms of functioning in the workplace, including WA risk, they encompass a wide range of behaviors, emotions, and motivations that go beyond the scope of evaluating the workaholic climate at work. The focus of the present study was to evaluate the general workaholic work environment with two major sources affecting this type of organizational climate: leaders and employees. To achieve this goal, the authors developed a brief measure of the perceived WA symptoms in a direct supervisor and colleagues. Thus, the first hypothesis was that the correlated two-factor model for the perceived supervisor's WA and colleagues' WA would show a good fit to the data, scalar

measurement invariance across cultures, between genders, and job positions, and acceptable reliability, and convergent and discriminant validity (H_1). Secondly, based on the aforementioned theories and research findings (Atroszko & Atroszko, 2020; Bakker et al., 2023; Barsade et al., 2018; Decuyper et al., 2020; Morkevičiūtė & Endriulaitienė, 2020; Pletzer et al., 2024), it was hypothesized that the direct supervisor's WA and colleagues' WA would be positively related to one's own WA (H_2). Thirdly, considering the wide range of adverse effects associated with WA (Atroszko, 2022; Clark, Michel, et al., 2016), it was hypothesized that the direct supervisor's WA and colleagues' WA would be positively related to one's job stress and negatively related to one's job satisfaction across cultures (H_3). Since WA is associated with higher job stress and lower job satisfaction across the globe (Charzyńska et al., 2025), it can be expected that the direct supervisor's WA and colleagues' WA would also be negatively related to one's own functioning in terms of stress and job satisfaction via a similar mechanism that WA risk could be increased (e.g., increased job demands, limited support, or contagion effects).

METHOD

Participants

The sample consisted of 33,222 participants (63.2% females) from 85 countries and territories, including 34 located in Europe, 29 in Asia, eight in South America, seven in Africa, five in North America, and two in Australasia (see the map depicted on Fig. S1 and Table S1 for a list of all countries and territories included in the study). The mean age of participants was 39.35 years ($SD = 11.37$). The socio-demographic characteristics of participants are presented in Tables S1 and S2 and Supplementary Material 1. The inclusion criteria were (i) living in a given country/territory and being its citizen, (ii) being an adult (according to the applicable laws), (iii) working in an organization with at least ten employees in total, (iv) working for the present employer for at least a year, and (v) being full-time employed. Participants with any occupation could join the study provided that they met the above inclusion criteria. The detailed work-related characteristics of the participants are presented in Table S3 and Supplementary Material 1.

Measures

Perceived direct supervisor's work addiction and perceived colleagues' work addiction. Perceived direct supervisor's WA and perceived colleagues' WA were assessed with six self-developed items (three parallel items in content for both constructs) assessing three symptoms of WA: salience, loss of control, and problems (World Health Organization [WHO], 2019; see Table 1 and the Appendix). The scales used only three items instead of the typically used frameworks of six common addiction symptoms (Griffiths, 2005) for two main reasons. First, these items reflect core addiction symptoms as specified in the International Classification of

Diseases (ICD-11), i.e., (i) increasing priority given to the behavior to the extent that it takes precedence over other life interests and daily activities (salience), (ii) impaired control over the behavior (loss of control); and (iii) continuation or escalation of the behavior despite the occurrence of negative consequences (problems; WHO, 2019). Second, the items refer to manifestations of the symptoms that are perceivable by coworkers. While withdrawal or mood modification tend to be central features in common component-based screening tools associated with psychopathological symptoms (Fournier et al., 2023), they would be very difficult to assess and unreliable indicators of addiction when observer ratings are used. Also, tolerance is similarly unreliable and tends to be non-central (Fournier et al., 2023), while conflict, to some extent, overlaps with problems as they cover the negative consequences aspect of addiction.

The two-factor instrument was named the Perceived Coworkers' Work Addiction Scale (PCWAS). For the assessment of perceived direct supervisor's WA, the participants were asked to rate on a seven-point Likert scale (1 = "strongly disagree" to 7 = "strongly agree") the degree to which they agreed or disagreed with the statements describing their direct supervisor's attitude toward work (e.g., "My direct supervisor behaves like s/he has lost control of how much s/he works"). This subscale was named the Perceived Work Addiction – Supervisor (PWA-S). For the assessment of perceived colleagues' WA, participants were asked to declare how many colleagues (1 = "nobody" to 7 = "all the people") could be described by given statements (e.g., "Their lives seem to be focused exclusively on work"). This subscale was named the Perceived Work Addiction – Colleagues (PWA-C).

Work addiction. WA was assessed using the International Work Addiction Scale (IWAS; Charzyńska et al., 2025), which was recently developed partially based on the BWAS (Andreassen et al., 2012) and its alternative version (Orosz et al., 2016). In the present study, the five-item version of the IWAS (IWAS-5), covering the core addiction symptoms (i.e., salience, problems, conflict, mood modification, and relapse; WHO, 2019), was used, as it has been found to be optimal for cross-cultural research (Charzyńska et al., 2025). This version uses two items from the BWAS; however, most items are newly developed to overcome the limitations of the BWAS items in terms of limited diagnostic utility and lack of cross-cultural invariance (Charzyńska et al., 2025). When responding to the IWAS-5 items (e.g., "How often during the last year have you worked so much that it has negatively influenced your health?"), participants were asked to select a frequency option (1 = "never," 2 = "rarely," 3 = "sometimes," 4 = "often," and 5 = "always") that best described them. The reliability of the IWAS-5 in the present study ranged from 0.63 to 0.90 across cultures (see Table S4), as calculated with Cronbach's alpha (α) and McDonald's omega (ω).

Job stress. Job stress was assessed using a single item developed by Houdmont et al. (2021): "In general, how do you find your job?" The item was rated using a seven-point Likert scale (1 = "not stressful at all" to 7 = "very stressful").

The reliability and validity of the item have been supported in previous studies (see Houdmont et al., 2021).

Job satisfaction. A single item by Dolbier, Webster, McCalister, Mallon, and Steinhardt (2005) was used to assess job satisfaction: “Taking everything into consideration, how do you feel about your job as a whole?”. The item was rated using a seven-point Likert scale (1 = “not at all satisfied” to 7 = “very satisfied”). This short measure has been frequently used in previous studies and has demonstrated adequate reliability and validity (see Dolbier et al., 2005).

Procedure

The study was part of a larger project concerning WA, exploring its potential antecedents and outcomes (preregistration available at <https://osf.io/8asnm>). The research team prepared the different language versions of the survey using the guidelines provided by the project’s leaders (see [Supplementary Material 2](#)). Details on the language of the survey used in each culture are presented in [Table S5](#). Data were collected online from autumn 2022 to winter 2023 (for details, see [Supplementary Material 2](#)).

Statistical analysis

The methods adopted for data cleaning and dealing with missing data are presented in [Supplementary Material 3](#). After the imputation of missing values, a factorial validity of the model with two correlated factors (i.e., perceived direct supervisor’s WA and perceived colleagues’ WA), each containing three items, was tested in MPlus, version 8.0 (Muthén & Muthén, 2017) across all cultures using confirmatory factor analysis (CFA) with a maximum likelihood mean-variance adjusted (MLMV) estimator (see Maydeu-Olivares, 2017). Although the Likert scale technically produces ordinal data, they are often used as continuous for statistical reasons, considering its theoretical and practical simplicity (Norman, 2010; Wang & Wang, 2012). Importantly, it has been shown that treating Likert data with five or more points as continuous does not cause substantial bias (Norman, 2010; see also Rhemtulla, Brosseau-Liard, & Savalei, 2012); of note, in the PCWAS, a seven-point Likert scale has been used.

The model fit criteria included relative χ^2 (χ^2/df), Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), root mean square error of approximation (RMSEA), and standardized root mean squared residual (SRMR). A good model fit is indicated by the values of the relative $\chi^2 \leq 2$, CFI and TLI ≥ 0.95 , RMSEA ≤ 0.06 , and SRMR ≤ 0.08 (Hu & Bentler, 1999; Wang & Wang, 2012), whereas values of the relative $\chi^2 \leq 5$, CFI and TLI ≥ 0.90 , and RMSEA and SRMR ≤ 0.10 indicate acceptable model fit (Kline, 2011; Marsh & Hocevar, 1985). Due to the similar wording of the parallel items of both factors, the modification indices (MI) between the corresponding items were inspected.

After establishing the final model, the measurement invariance of the model across cultures and between genders and job positions was tested using multigroup CFA

(MGCFA) in Mplus, version 8.0. The configural (assuming the same factorial structure across groups), metric (the same factorial structure and fixed factor loadings), and scalar (the same factorial structure with fixed factor loadings and intercepts) models were examined sequentially. Changes (Δ) in CFI, TLI, and RMSEA were used to compare subsequent models. Measurement invariance is typically considered established when $\Delta CFI \leq -0.010$ and $\Delta RMSEA \leq 0.015$ (Chen, 2007; Cheung & Rensvold, 2002). As further suggested by Chen (2007), these thresholds can be more stringent (i.e., $\Delta CFI \leq -0.005$ and $\Delta RMSEA \leq 0.010$) for sample sizes smaller than 300, the unequal ratio between groups, and the uniform pattern of measurement non-invariance. As for TLI, although ΔTLI standards have not been formally established, the criterion of ≤ -0.010 for this alternative fit index is often applied (see, e.g., Kuan, Sabo, Sawang, & Kueh, 2020; Protzko, 2024).

However, the above cut-off values are recommended for studies involving two groups and may not be suitable for large-scale research (see Desa, Van de Vijver, Carstens, & Schulz, 2019). For example, based on the results of the simulation study involving multiple countries (10 or 20), Rutkowski and Svetina (2014) suggested that when the number of groups is large, metric measurement invariance is indicated by a change in RMSEA of less than or equal to 0.03 and a change in CFI of less than or equal to -0.02 . Of note, in Rutkowski and Svetina’s (2014) study, the data were simulated as ordered categorical and the weighted-least squares (WLS) estimator was used. Notably, to align the simulation with authentic conditions applied in the original study, the models assumed the normality of observed variables (for details, see Rutkowski & Svetina, 2014).

Since scalar measurement invariance is very rarely observed in large-scale studies, for cultures, alignment was used as a more flexible approach to estimating the measurement invariance (Asparouhov & Muthén, 2014). The alignment approach is based on the configural model, and using the optimization procedure yields the final alignment model that minimizes the amount of non-invariance without deteriorating the model fit. The rule of thumb of a maximum of 25% non-invariant items suggested by Muthén and Asparouhov (2014) was applied to check if the results of the alignment were trustworthy. The latent means for the groups were then calculated and compared.

In the next step of the analysis, descriptive statistics and bivariate correlations for the perceived direct supervisor’s WA and perceived colleagues’ WA items were computed. Following this, the reliability (using Cronbach’s α and McDonald’s ω), convergent validity (using the average variance extracted [AVE] and the critical ratio [CR]) and discriminant validity (using AVE and the squared factor correlation between the subscales) of the measures were calculated.

Next, using 50 imputed datasets, Pearson’s (r) correlation coefficients with 95% confidence intervals were computed to examine the relationships between the perceived direct supervisor’s WA and perceived colleagues’ WA with one’s own WA, job stress, and job satisfaction. Lastly, the unique

contributions of both variables (i.e., perceived direct supervisor’s WA and perceived colleagues’ WA) to one’s own WA, job stress, and job satisfaction were analyzed using structural equation modeling (SEM) with the MLMV estimator for each culture separately, also based on 50 imputed datasets. The model fit indices used to evaluate the SEM models were consistent with those applied in the CFA.

Ethics

The study was conducted in accordance with the Declaration of Helsinki. The Ethics Committee at the University of Silesia in Katowice, Poland, approved the study (KEUS266/06.2022). The list of the ethical approvals obtained from local ethics committees is presented in [Supplementary Material 4](#). The responses to the survey were anonymous, and participation in the study was voluntary. All participants were informed about the purpose and content of the study and all provided online informed consent.

RESULTS

Confirmatory factor analysis

The steps for preparation of the final version of the PCWAS are described in [Supplementary Material 5](#), and the CFA results for the subsequent models are presented in [Tables S6–S8](#) (for the summary of the factor loadings for the final version of the PCWAS, see [Table 1](#)). Overall, in all cultures, the tested model fit the data well ([Table S8](#)), and the PWA-S and PWA-C scales were related to each other (ranges from 0.24 to 0.86; see [Table S8](#)).

Measurement invariance

The detailed results of the measurement invariance testing are described in [Supplementary Material 6](#). Scalar measurement invariance was supported for genders and job positions (see [Table 2](#) and [Table S9](#)). No gender differences were noted for either subscale of the PCWAS, but higher levels of both subscales were observed in managers compared to nonmanagers (see [Table S10](#)). For cultures, approximate measurement invariance was established (see [Supplementary Material 6](#) and [Tables S11–S13](#) for details).

Descriptive statistics, correlations, reliability, and convergent and discriminant validity of the PCWAS

[Tables S14–S17](#) present the PWA-S and PWA-C items’ descriptive statistics and correlation coefficients for each culture separately. No items or subscales of the PCWAS, except for the kurtosis values for the PWA-C in Mozambique, showed substantial departures from normality, as indicated by the skewness and kurtosis values, which lay between -2 and 2 ([George & Mallery, 2010](#); for details, see [Tables S14 and S15](#)). For the vast majority of the cultures (i.e., 90.6% for the PWA-S and 96.5% for the PWA-C), the PCWAS showed good or acceptable reliability (see [Table S18](#)). The PWA-S achieved a value of $AVE \geq 0.5$ for 51 cultures (60.0%) and the PWA-C for 71 cultures (83.5%). For most cultures (84.7% for the PWA-S and 97.6% for PWA-C), a value of the CR reached the threshold of 0.6, supporting convergent validity (see [Table S18](#); [Fornell & Larcker, 1981](#)). Moreover, in the vast majority of cultures (88.0%), the discriminant validity held for the PWA-S and

Table 1. Items, descriptive statistics, and the summary of the factor loadings for the two subscales of the Perceived Coworkers’ Work Addiction Scale (PCWAS)

Item content	Descriptive statistics				Number (percentage) of standardized factor loadings reaching a given value	
	M	SD	Skewness	Kurtosis	≥ 0.40	≥ 0.60
PWA-S (Instruction: <i>Please think about your direct supervisor and his/her attitude to work. Using the 1–7 scale, please indicate to what extent you agree or disagree with the following statements.</i>)						
1. The entire life of my direct supervisor seems to be focused exclusively on work.	4.12	1.93	−0.09	−1.10	71 (83.5%)	41 (48.2%)
2. My direct supervisor behaves like s/he has lost control of how much s/he works.	3.33	1.95	0.40	−1.02	84 (98.8%)	83 (97.6%)
3. An excessive workload has a negative impact on the functioning of my direct supervisor (e.g., on his/her health, mood, and relationships with other workers).	3.82	1.97	0.11	−1.16	84 (98.8%)	64 (75.3%)
PWA-C (Instruction: <i>Now please think about your colleagues that you meet at least from time to time (face-to-face or online). Please indicate how many of these people could be described by the following sentences.</i>)						
1. Their lives seem to be focused exclusively on work.	3.27	1.38	0.47	−0.31	79 (92.9%)	63 (74.1%)
2. They behave like they have lost control of how much they work.	2.93	1.37	0.66	−0.05	85 (100.0%)	84 (98.8%)
3. An excessive workload has a negative impact on their functioning (e.g., on their health, mood, and relationships with other workers).	3.46	1.54	0.45	−0.57	84 (98.8%)	52 (61.2%)

Note. PWA-S = Perceived Work Addiction – Supervisor, PWA-C = Perceived Work Addiction – Colleagues, *M* = mean, *SD* = standard deviation. The items of the PWA-S and PWA-C are assessed using a seven-point Likert scale. *N* = 33,222.

Table 2. Measurement invariance with multi-group confirmatory factor analysis (MGCFA) across cultures and between genders and job positions for the PCWAS

Model	$\chi^2_{(df)}$	RMSEA (90% CI)	CFI	TLI	Δ RMSEA	Δ CFI	Δ TLI
Cultures ^a							
Configural	808.61 ₍₅₁₆₎	0.038 (0.033, 0.043)	0.994	0.985			
Metric	2,007.15 ₍₈₅₂₎	0.059 (0.056, 0.062)	0.976	0.964	0.021	-0.018	-0.021
Scalar	5,521.45 _(1,188)	0.097 (0.094, 0.099)	0.910	0.904	0.038	-0.066	-0.060
Genders (female vs. male)							
Configural	123.14 ₍₁₂₎	0.024 (0.020, 0.028)	0.991	0.978			
Metric	134.05 ₍₁₆₎	0.021 (0.018, 0.024)	0.991	0.982	-0.003	0	0.004
Scalar	150.18 ₍₂₀₎	0.020 (0.017, 0.023)	0.990	0.984	-0.001	-0.001	0.002
Job positions (nonmanagers vs. managers)							
Configural	136.83 ₍₁₂₎	0.025 (0.021, 0.029)	0.989	0.974			
Metric	147.91 ₍₁₆₎	0.022 (0.019, 0.026)	0.989	0.979	-0.003	0	0.005
Scalar ^a	218.52 ₍₂₀₎	0.024 (0.022, 0.027)	0.983	0.975	0.002	-0.006	-0.004

Note. *df* = degrees of freedom, RMSEA = root mean square error of approximation, 90% CI = 90% confidence interval, CFI = Comparative Fit Index, TLI = Tucker-Lewis Index, Δ RMSEA/CFI/TLI = change in RMSEA/CFI/TLI. For model fit in each group, see Tables S8 and S9.

^aAfter detecting that the scalar measurement invariance failed to be established across cultures, approximate measurement invariance using an alignment method was used (for details, see Table S11).

PWA-C, as indicated by the higher values of the AVEs for both subscales than the squared factor correlation between the subscales (see Table S18; Fornell & Larcker, 1981).

Relationships between the PCWAS subscales and one's own WA, job stress, and job satisfaction

Pearson correlations. Table S4 presents the descriptive statistics for one's own WA, job stress, and job satisfaction. The distribution of the analyzed criterion variables did not deviate substantially from normality, which was indicated by the skewness and kurtosis values (George & Mallery, 2010; see Table S4). In Table S19, Pearson's (*r*) correlation coefficients with 95% confidence intervals between the

perceived direct supervisor's WA, perceived colleagues' WA, and the above variables are presented (for the summary of correlations, see Table 3). Perceived colleagues' WA was positively related to one's own WA in all cultures, whereas perceived direct supervisor's WA was positively related to this variable in all cultures except Slovenia (98.8%), where the relationship was nonsignificant. The overall relationship was higher for the perceived colleagues' WA and one's own WA (0.42 [95% CI: 0.39, 0.45]) than that between the perceived direct supervisor's WA and one's own WA (0.28 [95% CI: 0.25, 30]). To gain more insight into the relationship between perceived coworkers' WA and one's own WA, Pearson's correlation coefficients were also computed with 95% confidence intervals between the

Table 3. Summary of the results for Pearson (*r*) correlations and structural equation models of the perceived direct supervisor's WA and perceived colleagues' WA in relation to one's own WA, job stress, and job satisfaction

Subscales of the PCWAS	One's own WA		One's own job stress		One's own job satisfaction	
	Range (across all cultures)	Number (%) of cultures with a significant positive relationship between variables ^a	Range (across all cultures)	Number (%) of cultures with a significant positive relationship between variables ^b	Range (across all cultures)	Number (%) of cultures with a significant negative relationship between variables
Pearson correlation						
Perceived direct supervisor's WA	-0.02; 0.49	84 (98.8%)	0.04; 0.43	76 (89.4%)	-0.37; 0.17	55 (64.7%)
Perceived colleagues' WA	0.26; 0.58	85 (100%)	0.04; 0.51	81 (95.3%)	-0.43; 0.06	64 (75.3%)
Structural equation modeling (SEM)						
Perceived direct supervisor's WA	-0.16; 0.36	34 (40.0%)	-0.22; 0.35	31 (36.5%)	-0.37; 0.36	41 (48.2%)
Perceived colleagues' WA	0.09; 0.74	83 (97.6%)	-0.21; 0.47	68 (80.0%)	-0.46; 0.16	42 (49.4%)

Note. PCWAS = Perceived Coworkers' Work Addiction Scale, WA = work addiction.

^aIn the SEM model, the relationship between the perceived direct supervisor's WA and one's own WA was significant and negative in one culture (Slovenia).

^bIn the SEM model, the relationship between the perceived direct supervisor's WA and one's own job stress was significant and negative in one culture (Algeria).

PCWAS subscales and IWAS-5 items (see Table S20). The correlations with respective subscales were primarily similar for all IWAS-5 items, with relatively strongest for the problems component (Item 5) and relatively weakest for the salience component (Item 1).

The positive relationship between perceived direct supervisor’s WA and one’s own job stress was significant for 76 out of 85 cultures (89.4%), with an average correlation coefficient of 0.20 (95% CI: 0.18, 0.22). The positive relationship between the colleagues’ WA and one’s own job stress was significant for 81 cultures (95.3%). The average correlation coefficient was 0.25 (95% CI: 0.21, 0.30). For the remaining cultures, the relationship between the PCWAS subscales and one’s own job stress was nonsignificant.

The negative relationship between the perceived direct supervisor’s WA and one’s own job satisfaction was significant for approximately two-thirds of the cultures ($n = 55$; 64.7%). For the remaining cultures, the relationship was nonsignificant. The average correlation coefficient was -0.15 (95% CI: $-0.18, -0.13$). The relationship between the perceived colleagues’ WA and one’s own job satisfaction was significant and negative for three-quarters of the cultures ($n = 64$; 75.3%). The average correlation coefficient was -0.17 (95% CI: $-0.22, -0.13$). For the remaining cultures, the relationship was nonsignificant.

Unique contribution of supervisor’s and colleagues’ WA: The SEM models. Three SEM models were built to examine the relative contribution of the perceived direct supervisor’s WA and the perceived colleagues’ WA to one’s own WA, job stress, and job satisfaction, each for another dependent variable. An example of the SEM model (for WA)

tested in the present study is depicted in Fig. 1. All models tested across cultures except two had a good or acceptable model fit (see Supplementary Material 7 and Tables S21–S23).

Perceived direct supervisor’s WA was positively related to one’s own WA in 34 cultures (40.0%; see Table S24 for details and Table 3 for the summary of SEM results). As an exception, this variable was negatively related to one’s own WA in Slovenia. The standardized coefficients for this variable ranged from -0.16 to 0.36 across cultures. Perceived colleagues’ WA was positively related to one’s own WA in 83 cultures (97.6%), with standardized coefficients ranging from 0.09 to 0.74 (see Table S24). The percentage of the explained variance in one’s own WA ranged from 8% to 51%.

Perceived direct supervisor’s WA was positively related to one’s own job stress in 31 cultures (36.5%; see Table S25). A negative relationship between these variables was noted in one culture (Algeria; 1.2%). The standardized coefficients ranged from -0.22 to 0.35 across cultures. As for perceived colleagues’ WA, it was positively related to one’s own job stress in 68 cultures (80.0%), with standardized coefficients ranging from -0.21 to 0.47 across cultures (see Table S25). The percentage of the explained variance in one’s own job stress ranged from 1% to 29%.

Perceived direct supervisor’s WA was negatively related to one’s own job satisfaction in 41 cultures (48.2%; see Table S26). The standardized coefficients for this variable ranged from -0.37 to 0.36 . One’s own job satisfaction was also negatively related to the perceived colleagues’ WA in 42 cultures (49.4%), with standardized coefficients ranging from -0.46 to 0.16 (see Table S26). The percentage of the explained variance in one’s own job satisfaction ranged from 0% to 20%.

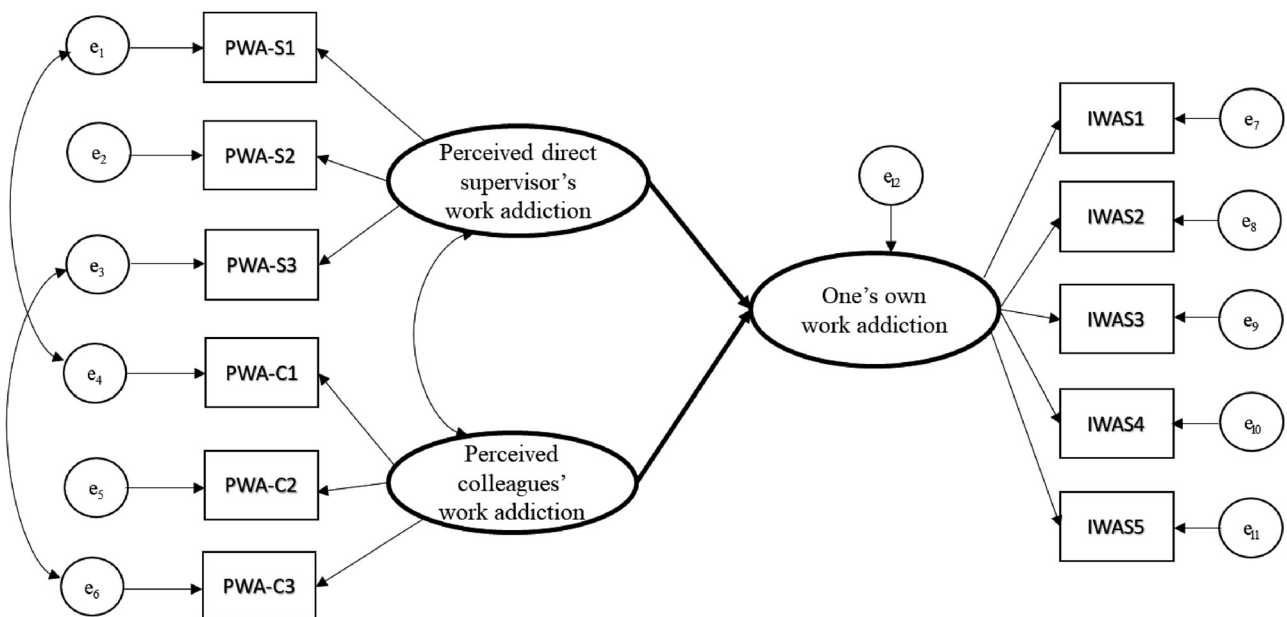


Fig. 1. Example Structural Equation Model Tested in the Study

Note. In the remaining two SEM models tested in the present study, one’s own work addiction was replaced by job stress and job satisfaction as a dependent variable, respectively. Both job stress and job satisfaction were assessed with single items.

DISCUSSION

The main aim of the present study was to examine the associations between perceived coworkers' WA and one's own WA, job stress, and job satisfaction. For this purpose, a brief cross-culturally invariant measure of the perceived WA symptoms among a direct supervisor and colleagues was developed. The correlated two-factor model for the perceived direct supervisor's WA and perceived colleagues' WA showed scalar measurement invariance between genders and job positions and approximate measurement invariance across cultures. The reliability of both subscales was acceptable (≥ 0.6) in almost all cultures, and convergent and discriminant validity indices were adequate in the vast majority of the cultures (supporting H_1). However, it needs to be considered that the subscales comprised only three items. Since reliability is a function of scale length, relatively lower reliability indices were expected in the present study. Overall, the subscales showed good validity and reliability for such a brief and indirect measure of coworkers' WA (for a more detailed discussion of the results, see [Supplementary Material 5](#)). The PCWAS can be considered a useful instrument to approximate the level of the supervisor's and colleagues' WA as an employee perceives it.

As hypothesized, the supervisor's and colleagues' WA was positively correlated with one's own WA (supporting H_2). This finding is consistent with theories that explain the influence of leaders and colleagues on employees in terms of behaviors and attitudes related to work involvement and effort in the workplace ([Barsade et al., 2018](#); [Deci et al., 2017](#); [Decuyper et al., 2020](#); [Pletzer et al., 2024](#)). While, in this context, the previous studies mostly focused on positive work engagement, the current research provides robust data showing that managers and colleagues may exert a harmful influence on employees by increasing their workaholic tendencies. It is congruent with previous studies on WA, which demonstrate that managers experiencing WA may be a strong driving force behind team members' workaholic behaviors ([Atroszko & Atroszko, 2020](#)). Workaholic supervisors create a workaholic climate and environment, which may affect the team and create dynamics among the members that foster WA.

Interestingly, perceived colleagues' WA rather than the supervisor's WA was more strongly associated with one's own WA. Moreover, in SEM models, perceived colleagues' WA was significantly related to one's own WA in almost all cultures, while perceived supervisor's WA was only related to one's own WA in less than half of the cultures. There are two major reasons why this may be the case. Firstly, the supervisor's influence can be, to some extent, indirect via the workaholic climate and managerial practices implemented in leading the team. Secondly, colleagues may have various effects on an individual's WA independent of the supervisor's impact ([Kerr & Jermier, 1978](#); [López-Cabarcos, Vázquez-Rodríguez, & Quiñoá-Piñeiro, 2022](#); [Lord, Day, Zaccaro, Avolio, & Eagly, 2017](#); [Oc, 2018](#)). These may include (i) more direct and prolonged contact and more

frequent interactions with colleagues rather than with supervisors, which may, for example, reinforce contagion effects ([Barsade et al., 2018](#)), (ii) group dynamics that create a workaholic environment and climate irrespective of supervisor's influence, (iii) effects of particular colleagues who are addicted to work irrespective of supervisor's WA and impact, and (iv) specificity of occupation type or employee recruitment and selection processes ([Schneider, 1987](#)), i.e., some work teams in particular organizations may be pre-selected based on their workaholic tendencies and associated traits ([Chang et al., 2016](#); [Ocampo, Wang, Kiazad, Restubog, & Ashkanasy, 2020](#)) such as, notably, perfectionism ([Clark, Michel, et al., 2016](#); [Kun et al., 2020](#)) and obsessive-compulsive personality disorder (OCPD; [Atroszko et al., 2020](#)). These potential mediating effects of the supervisor's WA through colleagues' WA and other mechanisms should be further investigated in future longitudinal studies, allowing for more robust inference concerning mediational mechanisms. Moreover, the correlations between perceived supervisor's WA and colleagues' WA varied somewhat across the cultures but typically were in the high or very high range. This demonstrates strong association and (i) potential considerable effects of supervisor's WA on the team's WA, or (ii) organizational culture effects, including potential pre-selection of employees with workaholic tendencies.

As hypothesized, perceived direct supervisor's WA and colleagues' WA were positively correlated to job stress in almost all cultures and were negatively associated with job satisfaction in most cultures (largely supporting H_3). On average, correlations with job satisfaction were somewhat lower than those with job stress. This was expected because job stress is a more unambiguously disadvantageous phenomenon, being both a potential negative consequence as well as a risk factor for workaholic behaviors (cf. the loss spiral in JD-R theory; [Bakker et al., 2023](#)). In contrast, to some extent, job satisfaction may overlap with positive reinforcement effects driving WA. Pleasure derived from substance use or behavior is one of the main factors associated with the development of addictive disorders ([Volkow, Michaelides, & Baler, 2019](#)). Depending on the addiction stage, there may be more satisfaction derived from work in the early phases or a more pronounced negative attitude toward work in later stages associated with burnout ([Clark, Michel, et al., 2016](#)). This may typically affect the lower strength of the association between WA and job satisfaction compared to other potential negative consequences of WA ([Clark, Michel, et al., 2016](#)). Correlations with criterion variables differed significantly across cultures. Cultural factors and sample characteristics may potentially affect these differences. Future studies could provide more insight into this.

Also, similar to the effects on WA in the SEM models, perceived colleagues' WA was more often significantly related to high job stress than perceived supervisor's WA. This is consistent with the assumption that the factors that regulate a work team have a more direct and stronger effect on an employee than a leader's effects. These may include

previously discussed more frequent interactions, group dynamics, particular colleagues' influences, specificity of occupation type, or employee recruitment and selection processes. The bottom line seems to be that colleagues' WA may have a more direct and stronger negative influence on an employee than their supervisor's WA in terms of higher WA risk and higher job stress.

There were no differences between genders in latent means on both subscales, showing that the perception of coworkers' WA does not differ between females and males. However, managers tend to perceive their coworkers as having higher WA. This aligns with the consistent findings that managers show higher WA (Clark, Stevens, et al., 2016) and suggests this does not significantly bias their perception of workaholic behaviors of supervisors and colleagues (which more often are other managers, i.e., they correctly perceive more workaholic behaviors among them).

The associations of one's own WA with job stress and job satisfaction are highly consistent with previous studies and are discussed in detail elsewhere (Charzyńska et al., 2025). They show that WA is clearly a universally problematic phenomenon worldwide, and it is considerably associated with high stress at work and lower job satisfaction.

Implications

To the authors' knowledge, this is the first study to show that workaholic leaders and colleagues may exert considerable impact on employees WA across the globe. It opens the door to further systematic investigation and identification of the main mechanisms that explain how this influence is carried. These may include potential complex patterns involving leadership styles mediated by colleagues' effects and group dynamics. For example, high job demands from the manager on one employee may affect the other employee via a contagion effect, increasing demands or withdrawing resources, including support. The work and organizational psychology literature provides theoretical frameworks and accumulated empirical data for understanding the impacts of leaders and colleagues on employee engagement, functioning, and performance (Barsade et al., 2018; Deci et al., 2017; Decuyper et al., 2020; Pletzer et al., 2024). Research within leadership theories (such as transformational, transactional, and LMX) may explain specific dynamics of workaholic behaviors in terms of their transmission from leaders to team members and their initiation or reinforcement by the leaders (Lord et al., 2017; Martin, Thomas, Legood, & Dello Russo, 2018). Destructive leadership theories (Einarsen et al., 2007; Northhouse, 2018) and JD-R theory (Bakker et al., 2023), in which leadership can be considered as a higher-order job demand or job resource, may prove useful in explaining how managers increase the risk of WA among employees. At the same time, the addiction framework may provide models that describe the specificity of the addictive process within the workplace environment, including positive and negative reinforcements and the role of stress in the etiology of addiction (Atroszko & Atroszko, 2020; Volkow et al., 2019).

The present study provides robust data showing that in different cultures around the world, the WA of an individual is closely associated with the perceived WA of their direct supervisor and colleagues at work. Moreover, associations between perceived direct supervisor's WA and colleagues' WA are mostly strong or very strong (see Table S8). This suggests that WA cannot be treated only as an individual problem but rather as a behavior that, to a considerable degree, may be affected by environmental factors and their interaction with individual vulnerabilities. Particularly, if the person initially experiences an appetitive effect (subjectively improved affect, level of arousal, or cognition) by engaging in excessive work. The factors affecting organizational workaholic culture and practices and the dynamics of WA at the interplay of supervisor's leadership and colleagues' climate need in-depth investigation. However, the present study's results have practical implications for the workplace environment.

Firstly, the WA of employees is not only their individual problem, but it is intrinsically associated with the workplace environment and relationships with coworkers. Therefore, awareness of this should decrease possible stigma associated with WA and guide organizational interventions that should take into account the wider context of the behavior, and address managerial practices and organizational culture and climate. Secondly, WA risk identification in organizations should focus on teams and leaders rather than just on individuals. This may decrease resistance to addressing the problem in the workplace since the focus of diagnosis and intervention is placed not on the individual but on group dynamics. Such interventions may analyze triggering factors for workaholic behaviors, such as organizational policies, goals, and values. The PCWAS can be a useful tool in conducting and monitoring such interventions. Finally, because WA is associated with specific individual risk factors, such as dysfunctional perfectionism and OCPD (Atroszko et al., 2020; Clark, Michel, et al., 2016; Kun et al., 2020), these may also be addressed at a team level with educational interventions raising awareness about their meaning and consequences, and at an individual level with appropriate care and sensitivity. The relative role of organizational factors and individual risks in shaping the group dynamics of workaholic behaviors requires further study.

Finally, differences in the strength of associations among the study variables across cultures point to the potential moderating role of culture, especially in how leadership is understood (Den Hartog & De Hoogh, 2024), as well as the way individuals function in the work environment (Gelfand, Erez, & Aycan, 2007). It may also reflect the differences in organizations recruited to the study in different cultures and, consequently, a potential moderating role of a workplace. While the present study showed that WA is intricately associated with the work environment worldwide, it also lays the foundation for future research into cultural factors that affect specific processes and mechanisms regulating WA in different cultures and organizations.

Cossin et al. (2021) propose several specific preventive measures for workaholism, including primary prevention that

involves the work environment or the work situation, and the organization and work practices. These include fostering a healthy work-life balance by limiting excessive overtime, implementing flexible work schedules, and promoting regular breaks during the workday. Organizations are encouraged to define clear work expectations and boundaries, such as discouraging after-hours communication and reducing excessive workloads. They also recommend creating a supportive workplace culture that values employee well-being, offering stress management workshops, mindfulness training, and employee assistance programs. On an individual level, they suggest providing access to cognitive-behavioral therapy, counseling, and psychoeducation about the risks of workaholism, alongside regular health checks to monitor early signs of burnout and overwork.

Strengths and limitations

To the best of the authors' knowledge, the present study is the first to investigate the psychometric properties (including measurement invariance) of a perceived coworkers' WA scale across a very diverse range of samples in terms of language and culture. It comprised a large sample size, allowing for sufficiently powered and meaningful statistical analyses, and provided a well-fitting model validated across 85 cultures, achieving scalar invariance between genders and job positions and approximate measurement invariance across cultures. The PCWAS showed good concurrent validity, confirming that it assesses a negative construct associated with high job stress (in most cultures) and low job satisfaction (in a majority of the cultures). As a result, the present study provides a brief measure with adequate psychometric properties in all 85 cultures. One's own WA, perceived supervisor's WA, and perceived colleagues' WA are all intricately associated, showing that this addictive behavior may strongly depend on environmental factors and the workaholic climate at work.

In terms of limitations, the studies used online convenience samples that were not nationally representative, which limits the generalizability of the findings. Although the hypotheses have been tested using the SEM framework, the cross-sectional design of the present study prevents definitive conclusions regarding causation between PCWAS and variables such as one's own WA, job stress, and job satisfaction. Alternative explanations, such as the potential for reverse causation or the influence of non-assessed confounding variables, should be investigated in future studies. Particularly, high job stress and low job satisfaction may contribute to a higher workaholic climate at work due to well-established links between stress and addiction. Also, external common causes for workaholism among coworkers, such as disadvantageous labor market regulations, should be taken into account.

The PCWAS used only three items per subscale, constituting a very brief and limited measurement of the constructs. Considering the simple nature of these indicators, it needs to be emphasized that the subscales should be treated more as a proxy measure of the constructs rather

than a precise estimate of the supervisor's WA and the level of WA among colleagues. Additionally, all data collected were self-reported, making it vulnerable to limitations associated with such data (e.g., common method, social desirability, and recall biases). Moreover, one's own WA may affect perceptions of WA of others either towards their underestimation (due to low awareness and denial, normalization of behavior) or overestimation (associated with projection and rationalization, comparison within highly WA environments, or due to empathy, increased sensitivity to the issue and consequently potential over-attribution of the problem). A proper social network analysis could overcome some of these limitations and provide more insight. In addition, single-item measures might exhibit restricted score variability, potentially leading to underestimating their relationships with other variables. However, despite their lack of precision for diagnosis, single-item measures demonstrate satisfactory validity and reliability within specific research domains, as evidenced in the present study exploring variable relationships (Matthews, Pineault, & Hong, 2022). Also, test-retest reliability of the PCWAS was not investigated. Mental health conditions are significantly associated with WA; however, this variable was not included in the analyses because it would exceed the scope of the present paper. Subsequent analyses should take mental health and its associations with WA into account.

CONCLUSIONS

It is concluded that the PCWAS is a valid and reliable short screening measure for assessing perceived supervisor's and colleagues' WA that can be used globally in clinical and organizational settings across different cultures and provide comparable and generalizable results (recommendations for the use of the PCWAS are available in [Supplementary Material 8](#) and in [Table S27](#)). The present study is the first to provide data supporting the notion that WA may considerably depend on environmental factors in various cultures worldwide. Perceived colleagues' WA may have a more direct and stronger negative influence on an employee than their supervisor's WA in terms of higher WA risk and high job stress. Future studies should investigate complex associations between the supervisor's WA and colleagues' WA, including potential mediating effects of the supervisor's WA through colleagues' WA, as well as different effects of colleagues' WA on their own WA independent of the supervisor's influence. Various indirect and direct processes and pathways (e.g., emotional contagion effects) of leaders' and colleagues' influence on employee workaholic behaviors and attitudes should be explored. Based on these findings, cost-effective organizational interventions may be developed and implemented to decrease WA risks among employees and improve their well-being and productivity.

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SUPPLEMENTARY MATERIAL

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Appendix

Perceived Coworkers' Work Addiction Scale (PCWAS)

Please think about your direct supervisor and his/her attitude to work. Using the 1–7 scale, please indicate to what extent you agree or disagree with the following statements.

1. The entire life of my direct supervisor seems to be focused exclusively on work.

1-----2-----3-----4-----5-----6-----7

Strongly disagree

Strongly agree

2. My direct supervisor behaves like s/he has lost control of how much s/he works.

1-----2-----3-----4-----5-----6-----7

Strongly disagree

Strongly agree

3. An excessive workload has a negative impact on the functioning of my direct supervisor (e.g., on his/her health, mood, and relationships with other workers).

1-----2-----3-----4-----5-----6-----7

Strongly disagree

Strongly agree

Now please think about your colleagues that you meet at least from time to time (face-to-face or online). Please indicate how many of these people could be described by the following sentences.

1. Their lives seem to be focused exclusively on work.

- a) nobody b) hardly anybody c) several people d) about half the people
e) many people f) almost all the people g) all the people

2. They behave like they have lost control of how much they work.

- a) nobody b) hardly anybody c) several people d) about half the people
e) many people f) almost all the people g) all the people

3. An excessive workload has a negative impact on their functioning (e.g., on their health, mood, and relationships with other workers).

- a) nobody b) hardly anybody c) several people d) about half the people
e) many people f) almost all the people g) all the people

Note. The Perceived Coworkers' Work Addiction Scale (PCWAS) is free for use for non-commercial purposes.