The Mediating Role of Psychophysic Strain in the Relationship Between Workaholism, Job Performance, and Sickness Absence

A Longitudinal Study

Alessandra Falco, PhD, Damiano Girardi, PhD, Luca Kravina, PhD, Elena Trifiletti, PhD, Giovanni Battista Bartolucci, MD, Dora Capozza, Prof, and Nicola A. De Carlo, Prof

Objective: To test a theoretical model in which workaholism predicts both directly and indirectly, via psychophysic strain, job performance and sickness absences. Methods: A multimethod study was performed examining a sample of 322 workers in a private company. The study was articulated into two phases, over a time period of 15 months. Workaholism was assessed using a self-report measure (time 1). Psychophysic strain was measured by the occupational physician, performance by the supervisor, and data on sickness absences were collected from the company’s database (time 2). Results: Results highlighted a positive relationship between workaholism and psychophysic strain. Psychophysic strain was negatively associated with job performance and positively associated with sickness absences. In addition, workaholism predicted sickness absences. Conclusion: Workaholism negatively affects the health of workers. This is associated with lower working performance and greater sickness absences.

Workaholism, or “the tendency to work excessively hard in a compulsive way,” is a construct that is widespread and observed all over the world. The prevalence of workaholism varies between 8% and 17.5% in different samples of graduate workers with peaks of 25% in samples of professionals such as doctors, lawyers, and psychologists. Other sociodemographic variables (eg, sex, age) do not seem to have a stable link with workaholism but are affected by the composition of the sample, the different conceptualizations of workaholism, and the different instruments used.

According to McMillan and O’Driscoll, workaholism has a multifactor origin. From an etiological point of view, in fact, it is difficult to find a univocal explanation to the onset of workaholism: personal dispositions, sociocultural experiences, behavioral structures, and vicarious learning can all be factors that favor the onset of workaholism. For this reason, according to the literature, it is necessary to analyze workaholism considering its different aspects (eg, cognitive, affective, behavioral) using a multidisciplinary approach.

In accordance with the aforementioned definition by Schaufeli et al., it is possible to identify the two central nuclei of workaholism: working excessively (WE) and working compulsively (WC). It is important to underline that workaholism is characterized by a simultaneous presence of high levels of the two dimensions. As underlined by Schaufeli et al., both WE and WC lead workers to be particularly involved in their work. On the one hand, WE leads workers to take on a considerable amount of work (eg, overwork), whereas WC leads to an obsessive commitment to work, which particularly involves mental and emotional demands. Shimazu and Schaufeli identify WE and WC, respectively, as the behavioral and cognitive dimensions of workaholism.

According to McMillan et al., workaholism can be considered as a stable characteristic of the individual. Workaholism affects styles of coping, cognitive aspects (eg, obsession, rumination), and emotive–affective aspects of the individual (eg, obsessive passion), as well as typical individual behaviors (eg, working a great number of hours). Workaholism is moreover associated with numerous negative consequences at an individual (eg, psychophysic strain, emotional breakdown), familial (eg, work–family conflict), and organizational levels (eg, poor social relationships). This study refers to the theoretical framework proposed by Hart and Cooper, according to which both organizational characteristics and individual characteristics contribute to the well-being of the worker. This, in turn, determines outcomes both at an individual level (eg, job performance [JP]; sickness absences [SAs]) and at an organizational level (eg, customer satisfaction, productivity loss). As well as this indirect effect, organizational and individual characteristics also have a direct link with these outcomes. According to the authors, organizational characteristics are the objective aspects of the work environment or the workers’ subjective perceptions regarding this environment. Individual characteristics are intended as factors associated with individual differences among workers, such as personality dimensions, styles of coping, individual attitudes, and behaviors.

It is claimed, therefore, that workaholism can be considered an individual characteristic, capable of influencing the health and performance of the worker. The aim of the present work consists, therefore, in testing a theoretical model in which workaholism predicts psychophysic strain, which, in turn, is related to JP and SAs (ie, psychophysic strain mediates the relation between workaholism and JP/SAs). In addition, workaholism is expected to exercise a direct effect on JP and SAs.
WORKAHOLISM AND PSYCHOPHYSIC STRAIN

In literature, numerous studies have highlighted a positive relation between workaholism and psychophysic strain. By definition, workaholics (high WE and high WC) dedicate a considerable amount of time to their work (eg, work overtime, work at home in the evening). Prolonged exposure to job demands means insufficient possibility for a complete recovery during after-work hours. This determines a breakdown at an emotive or cognitive level and, in the long run, the appearance of psychophysic symptoms. This can be explained on the basis of effort recovery model, according to which the performance of one's work requires efforts that must be followed by an adequate psychophysiological unwinding during after-work hours (ie, recovery). If this does not occur, the worker finds himself or herself in a suboptimal situation (ie, sustained activation) and must invest compensatory effort to achieve adequate performances. This affects the necessity for a greater recovery time. Thus, a vicious circle is established, which can, with time, cause health problems.

In addition, workaholics think obsessively about their work also during after-work hours (perseverative thinking). This can provoke emotional distress, feelings of guilt, and withdrawal symptoms (eg, anxiety symptoms) in the moment in which it is impossible for workaholics to dedicate themselves to their work. To avoid these negative emotions, workaholics think about work also during after-work hours, which determines less possibility for recovery experiences, in terms of both psychological detachment from work and relaxation. Psychological detachment from work refers to the ability of individuals to mentally “switch off” from work. Psychological detachment implies not only being absent from work, but also neither working at home (eg, checking e-mails) nor thinking about job-related issues (eg, future tasks) during after work hours.

Relaxation is a process characterized by low psychological, physical, and physiological activation that is positively associated with positive affect. Relaxation can be achieved by practicing relaxation techniques or by engaging in activities that require little physical or intellectual effort (eg, a light walk, listening to music). Lack of psychological detachment and relaxation may impair the recovery process. Indeed, a negative association has been observed between recovery experiences (ie, psychological detachment from work and relaxation) and fatigue, health complaints, emotional exhaustion, and sleep problems.

Therefore, we hypothesize that workaholism will be positively related to psychophysic strain (Hypothesis 1).

PSYCHOPHYSIC STRAIN, JOB PERFORMANCE, AND SICKNESS ABSENCES

Literature has evidenced a negative relation between psychophysic strain and JP. From a theoretical point of view, this can be explained by the fact that people invest resources to carry out their work, in terms of skills, general cognitive abilities, and task-relevant knowledge. These resources are limited, so the concept of resource allocation is central. If an individual invests his or her own resources entirely in work, he or she will obtain high levels of performance. Vice versa, if the resources are destined elsewhere, JP will suffer. In this perspective, negative affective states connected to anxiety and depression (ie, psychological strain) can induce the individual to divert his or her resources from performing the task toward the management of negative emotions (ie, affect regulation). They can generate perseverative thinking about his or her state of health (ie, rumination). This leads to the use of cognitive resources for activities not linked to performing one's work (ie, task-irrelevant thoughts) and, consequently, lower JP.

In literature, moreover, other mechanisms are described through which the negative affective states connected to psychological strain can influence performance. For example, negative affective states can negatively influence the self-efficacy of the worker, motivation, and, therefore, JP.

An analogous situation can be revealed in relation to physical strain, in which the pain or discomfort generated by physical symptoms can interfere with the individual’s cognitive resources, generating rumination or shifting the attention of the individual toward the specific symptom.

In accordance with the theoretical framework proposed by Hart and Cooper, SAs are considered a consequence of psychophysic strain. Sickness absences mean the nonattendance of an employee at work because of health complaints when this attendance is instead expected by the employer. Sickness absences are considered a valid indicator of the health of the worker. Some studies have, in fact, evidenced an association between SAs and future long-term self-rated health status, future disability pension, and mortality.

From an empirical point of view, numerous studies have shown a positive relation between psychophysic strain and SAs. According to Darr and Johns, work stress can be seen as a process in which the individual gradually develops psychological (ie, psychological strain), physical (ie, physical strain), and behavioral responses (ie, SAs) when faced with characteristics of the work environment perceived as threatening or potentially harmful. In their meta-analysis, Darr and Johns demonstrated how the perception of stressors determines psychophysic strain and, consequently, SAs. Overall, we therefore hypothesize that psychophysic strain will be negatively related to JP and positively related to SAs (Hypothesis 2).

WORKAHOLISM, JOB PERFORMANCE, AND SICKNESS ABSENCES

In literature, some studies have considered the relation between workaholism and JP. According to Schaufeli et al., workaholics work hard rather than smart. They create difficulties for themselves and their colleagues, are rigid, inflexible, and perfectionist, as well as not inclined to delegate. This, in the long run, can create conflict and friction in the workplace, which determines low social support and therefore low JP. In addition, as previously mentioned, JP depends on the resources that an individual dedicates to his or her work (ie, resource allocation). According to Gorgievski and Bakker, workaholism is characterized by an obsessive passion for one’s job and is associated with negative emotions (eg, guilt or feeling hassled) while or after carrying out one’s job. As a consequence, workaholics may use a part of their cognitive resources to deal with these negative emotions (ie, affect regulation), determining lower JP.

Apart from this cognitive strategy, workaholics can also resort to a behavioral strategy. According to van Wijhe et al., workaholics interpret their own negative emotions as dissatisfaction with their performance (ie, sensation of not having done enough) and try to handle these emotions by remaining mentally or physically involved in work during after-work hours (eg, by creating extra work). This precludes the possibility of an optimal recovery during the evening and determines more negative emotions the day after which, in turn, results in lower JP.

In addition, some authors proposed that psychophysic strain could mediate the relationship between workaholism and JP. According to Ng et al., indeed, workaholics work with energy and dedicate a lot of time to work over a short-term period. Nevertheless, in the long run, workaholics can undergo a decline in the state of their psychophysic health, which determines lower JP.

Overall, we expect that workaholism exerts both a direct and an indirect effect (through psychophysic strain) on JP. In particular, we expect workaholism to positively predict in the long run psychophysic strain, which, in turn, is negatively related to JP (ie,
negative indirect effect). In addition, workaholics, because of their perfectionism and obsessive passion for work,\textsuperscript{36,38} may use part of their cognitive resources to deal with negative emotions (such as guilt or feeling hassled) and receive in the long run low social support from colleagues and supervisors, which negatively affects JP (ie, negative direct effect). Therefore, we hypothesize that psychophysic strain partially mediates the relationship between workaholism and JP.

H3a: Workaholism exerts a negative indirect effect on job performance through psychophysic strain.

H3b: Workaholism exerts a negative direct (residual) effect on job performance.

To date, only a few studies have considered the relation between workaholism and SAs.\textsuperscript{11,39} Nevertheless, some characteristics of workaholics lead to believe that a direct negative relation exists between workaholism and SAs.\textsuperscript{1} Workaholics, because of their obsessive stimulus to work, are reluctant to disengage from work,\textsuperscript{11} inclined to disregard the eventual occurrence of symptoms of psychophysical strain to dedicate themselves to work.\textsuperscript{6} Workaholics, as a result, are reluctant to be absent even when they are ill, putting into practice behaviors representative of presenteeism (ie, going to work even when ill).\textsuperscript{1,40,41}

Overall, we expect that workaholism exerts both a direct effect and an indirect effect (through psychophysic strain) on SAs. In particular, we expect workaholism to positively predict psychophysic strain, which, in turn, is positively related to SAs (ie, positive indirect effect). In addition, because workaholics are reluctant to be absent from work even when they are ill, we hypothesize that workaholism negatively predicts SAs (ie, negative direct effect). Therefore, we hypothesize that psychophysic strain partially mediates the relationship between workaholism and SAs.

H4a: Workaholism exerts a positive indirect effect on sickness absences through psychophysic strain.

H4b: Workaholism exerts a negative direct (residual) effect on sickness absences.

\section*{METHODS}

\subsection*{Participants and procedure}

We conducted a longitudinal study in a mechanical engineering company located in North-East Italy. A sample of workers (N = 322) was obtained, through probability sampling, from the firm’s workforce of 500 workers. The sample consisted of 86 women and 234 men (2 missing data). Most respondents were aged between 40 and 50 years (45.5\%), 38.5\% were younger than 40 years, and 15.2\% were older than 50 years (4 missing data). For the work position, 52.8\% were blue collars and 45.9\% were white collars or managers (4 missing data). The majority (85.4\%) had been with the company for more than 5 years (13.7\% less than 5 years; 3 missing data).

Participants took part in the study on a voluntary basis. They were informed in advance by the management that the research concerned work-related stress and was articulated in two phases, over a period of 15 months. In December 2010 (time 1), workers completed a baseline questionnaire including a self-report measure of workaholism and possible confounders (ie, age, sex, job position, length of service). The questionnaire was administered in group sessions of approximately 40 workers, under the supervision of an occupational physician and an occupational psychologist. Each worker was given an identification code to connect the self-report measure to subsequent measures (psychophysic strain, SAs, and JP). This procedure took place after having obtained the written consensus of the worker, whose anonymity was guaranteed by the occupational physician and the occupational psychologist.

In February 2012 (time 2), workers were convened by the occupational physician who assessed psychophysical strain using a structured interview.\textsuperscript{42,43} The evaluation of workers’ performance was supplied by the supervisor, in the context of the evaluation of annual performances. In particular, the supervisor expressed a judgment for each worker, using a 10-point scale. The evaluation concerned the quality and quantity of the results obtained by the worker in the course of 2011. Finally, data concerning SAs for 2011 were obtained directly from the firm’s database.

\subsection*{Measures}

\textit{Workaholism} was measured with the Italian version\textsuperscript{2,44} of the Dutch Workaholism Scale.\textsuperscript{1} The scale includes two dimensions: working excessively (six items) and working compulsively (four items). Sample items are as follows: “I seem to be in a hurry and racing against the clock,” “I spend more time working than on socializing with friends, on hobbies, or on leisure activities” (WE); “I feel that there’s something inside me that drives me to work hard,” “I feel obliged to work hard, even when it is not enjoyable” (WC). Participants were asked to indicate how often they had these feelings on a six-point frequency scale, ranging from 1 (never) to 6 (always). Cronbach α was 0.77 for WE, 0.84 for WC, and 0.84 for the overall scale of workaholism.

\textit{Job strain} was measured using 17 physical and psychological symptoms taken from a scale developed in the Italian context.\textsuperscript{42,43,46} An occupational physician rated how often, during the previous 6 months, the worker felt each symptom, as a consequence of situations related to work. Examples of items are nausea, slow and difficult digestion, memory problems, and sleep problems. The occupational physician answered on a six-point frequency scale, ranging from 1 (never) to 6 (always). Cronbach α was 0.87.

\textit{Workers’ performance} was measured by asking their supervisor to answer the following question: “In your opinion, in what percentage the employee X has accomplished his/her goals during the last year?” The 10-point response scale ranged from 1 (10\%) to 10 (100\%).

The number of days of sickness absence for 2011 was obtained from the company’s records. The measure was split into two indicators, corresponding to the absence days for the first and second 2011 semesters.

\subsection*{Data Analysis}

Descriptive statistics and correlations between variables were obtained with SPSS 17. Hypotheses were tested using regression with latent variables (LISREL 8.7)\textsuperscript{47} In the regression model, workaholism predicts psychophysic strain, which, in turn, is related to JP and absenteeism. In addition, also the direct paths from workaholism to the outcome variables were estimated (see Fig. 1). Two indicators were created for workaholism, corresponding to the WE and WC dimensions. As to job strain, three indicators were obtained after the procedure of item-to-construct balance.\textsuperscript{48} We tested a one-factor model to obtain the item loadings. Using the three items with the highest loadings as anchors, we added to them, in an inverted order, the three items with the next highest loadings. This procedure was continued by allocating items with lower loadings to higher loaded parcels. For SAs, the two indicators were the number of absence days in the first and second semesters of 2011. The error term of performance (single-item measure) was constrained to zero.

The goodness of fit of the model was evaluated using the chi-squared test. A model fits the data well when chi-squared test is nonsignificant. Three additional goodness-of-fit indices were used: the comparative fit index (CFI), the standardized root mean squared residual (SRMR), and the root-mean-square error of approximation (RMSEA). Hu and Bentler\textsuperscript{49} suggested that the fit is satisfactory when CFI is equal to or greater than 0.95, and SRMR and RMSEA are equal to or less than 0.08. The reliability of mediation was tested.
using the Sobel test. Additional regression models were performed with SPSS 17.0 to control for the effects of sex, age, job position, and length of service. These control variables were dummy coded. For sex and job position, a single dummy variable was created, assigning 0 to women and blue collars, and 1 to men and white collars/managers, respectively. For age and length of service, two dummies were created. For age, in the first dummy, 0 was assigned to “between 40 and 50” and “over 50” and 1 was assigned to “below 40”; in the second dummy, 0 was assigned to “below 40” and “over 50” and 1 was assigned to “between 40 and 50.” For length of service, in the first dummy, 0 was assigned to “between 5 years” and “between 5 and 19 years” and 1 was assigned to “over 19 years”; in the second dummy, 0 was assigned to “between 5 years” and “over 19 years” and 1 was assigned to “between 5 and 19 years.” We performed four regression models. In the first, workaholism was the dependent variable; sex, age, job position, and length of service were the predictors. In the second model, psychophysic strain was the dependent variable; workaholism and the control variables were entered as predictors. In the third and fourth models, JP and SAs were the dependent variables, the predictors were workaholism, psychophysic strain, and the control variables.

All analyses were performed with LISREL 8.747 and SPSS 17.0. The null hypothesis was rejected when $P < 0.05$.

**RESULTS**

Descriptive statistics and correlations between variables are reported in Table 1. Participants reported moderate levels of workaholism. The physician evaluated the psychophysic symptoms as infrequent. Moreover, employees were absent from work because of sickness for approximately 1 week and they were evaluated by their supervisor as having accomplished most of their goals. Correlations between variables were in the expected direction, except for the association between workaholism and JP, which was nonsignificant. Nevertheless, the absence of a significant relationship between workaholism and JP does not preclude the testing of the mediation model. The possibility that mediation can exist even if the independent and dependent variables are not significantly related is acknowledged by several authors.51–54 In fact, it is possible that a suppression effect has occurred. Within a mediation model, a suppression effect is present when the direct (residual) and indirect effects have opposite signs and are similar in magnitude.51–53 Given that the total effect (not mediated) is the sum of the indirect and residual direct effects, when a suppression process occurs, the direct link between the independent variable and the dependent variable will be close to zero.

The hypothesized mediation model showed an excellent fit: $\chi^2(15) = 14.12, P = 0.52; \text{CFI} = 1.00; \text{SRMR} = 0.02; \text{RMSEA} = 0.00$. As shown in Figure 1, in which only significant parameters are reported, workaholism was positively related to psychophysic strain (Hypothesis 1), which, in turn, is related to lower levels of performance (Hypothesis 2); the indirect effect was $-0.10$ (95% CI $-0.18$ to $-0.02$). The application of Sobel test showed that mediation was significant ($z = 2.25, P = 0.024$), thus confirming Hypothesis 3a. Contrary to Hypothesis 3b, the direct link between workaholism and JP was not significant. In addition, results showed that the indirect and residual direct effects were similar in magnitude ($-0.10$ and 0.05, respectively), but opposite in sign, suggesting the presence of a suppression effect. This explains why the bivariate correlation between workaholism and JP was not significant (see Table 1).

As to SAs, psychophysic strain was positively associated with absence days (Hypothesis 2); the indirect effect was $0.91$ (95% CI $0.29$ to $1.23$). The Sobel test confirmed that mediation was significant ($z = 3.13, P = 0.002$); Hypothesis 4a was, therefore, confirmed. Moreover, consistent with Hypothesis 4b, a direct negative effect of workaholism on SAs was found. Therefore, as expected, the direct relationship between workaholism and absences was negative, whereas the indirect relationship via psychophysic strain was positive.

We also controlled for the effects of age, sex, job position, and length of service. Results showed that including these variables as predictors in the regression did not alter the relationships between workaholism, psychophysic strain, JP, and SAs. Nevertheless, job position was significantly related to workaholism, with white collars and managers reporting higher workaholism than blue collars ($b = 0.29, t = 5.11, P < 0.001$). Moreover, in contrast, higher for blue collars than for white collars and managers ($b = -0.23, t = 3.98, P < 0.001$). A significant effect of sex on psychophysic strain also emerged: strain symptoms were higher among women than among men ($b = -0.24, t = 4.64, P < 0.001$). No significant effects of demographic variables on performance were found.

**DISCUSSION**

In this study, as expected, a positive relationship between workaholism and psychophysic strain has been revealed (Hypothesis 1). Workaholics dedicate a lot of time to their work and think obsessively about it during after-work hours. These inclinations determine less opportunity for recovery and, in the long run, health problems.16 We also found a direct and negative relation between

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**TABLE 1. Correlations Between Study Variables ($n = 322$)**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Workaholism</td>
<td>3.34</td>
<td>0.93</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Psychophysic strain</td>
<td>1.57</td>
<td>0.42</td>
<td>0.32***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Job performance</td>
<td>6.97</td>
<td>1.26</td>
<td>−0.02</td>
<td>−0.16**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Sickness absences</td>
<td>7.32</td>
<td>11.95</td>
<td>−0.22***</td>
<td>0.14***</td>
<td>0.02</td>
<td></td>
</tr>
</tbody>
</table>

* $**P < 0.01$, $***P < 0.001$
psychophysic strain and JP, as well as a direct and positive relation between psychophysic strain and SA (Hypothesis 2).

Hypothesis 3, which stated that psychophysic strain partially mediates the relationship between workaholism and JP, was partially supported. Indeed, the indirect effect of workaholism on JP through psychophysic strain was significant (Hypothesis 3a supported), whereas the direct effect was not (Hypothesis 3b not supported). Therefore, psychophysic strain fully mediates the relationship between workaholism and JP. This study highlights the central role of psychophysic strain in the relation between workaholism and JP. Indeed, in the long run, workaholics can undergo a decline in the state of their psychophysic health, which determines lower JP.5 This is a strong point of our work, because previous studies, which analyzed the relationship between workaholism and JP, but did not take into account impaired psychophysic health as a mediator, showed inconsistent findings. For example, in two cross-sectional studies, Shimazu and Schaufeli2 found a weak negative association between workaholism and JP whereas Schaufeli et al51 found a weak positive association between workaholism and extra-role performance (ie, activities that promote organizational effectiveness but are not part of employees’ formal role requirements),55 while they found no association between workaholism and in-role performance (ie, activities that are related to employees’ formal role requirements).55 In addition, in a longitudinal study, Shimazu et al58 found no association between workaholism and subsequent change in JP.

Finally, a direct and negative relation emerged between workaholism and SAs, as well as an indirect positive relation through psychophysic strain. Therefore, Hypothesis 4 was fully confirmed. Psychophysic strain partially mediates the relationship between workaholism and SAs. In both this study and the negative direct effect that, at least partially, offsets each other. This could provide a possible explanation for why previous studies, which did not consider the mediating role of psychophysic strain, did not find any association between workaholism and SAs.55 Nevertheless, it is worth noting that in this study, the direct negative effect was stronger than the indirect positive effect and, in fact, the overall correlation between workaholism and SA (latent variable, Fig. 1) was negative, corresponding to \( r = -0.27 \) \( (P = 0.003) \). Therefore, in this study, workaholism restrains SAs.

Overall, this study can be referred to the theoretical framework proposed by Hart and Cooper.9 Workaholism, considered as an individual characteristic, influences workers’ well-being, with consequences at an individual and organizational level, especially in terms of lower levels of JP and more SAs.

CONCLUSION

The present study supplies several new contributions to the literature. First, few studies exist, which take into account the relation between workaholism and two outcomes: JP and SAs. Also, the hypothesis of the meditational role of psychophysic strain is new. Moreover, this study uses a longitudinal design, and variables were revealed using different information sources. These are self-reports for workaholism, the evaluation of occupational physician for psychophysic strain, the judgment of the supervisor for JP, and the company database for SAs. Our research design overcomes the limits of previous studies, which are often cross-sectional, and based on self-report measures (with the exception of the study by Shimazu et al).10 The longitudinal design allows us to obtain information about the direction of causality, and the use of different types of measures allows us to contain the common method bias.56 Nevertheless, this study presents some limitations. First, the sample used is a convenience sample, which limits generalization. Second, a single indicator of overall JP was employed, which does not allow the distinction between in-role performance (ie, activities that are related to employees’ formal role requirements) and extra-role performance (ie, activities that promote organizational effectiveness but are not part of employees’ formal role requirements).55 Some previous studies, in fact, evidenced a positive relation between workaholism and extra-role performance.11 Finally, psychophysic strain, JP, and SAs were analyzed simultaneously at time 2. This does not allow us to test the direction of causality for the relationship between strain and JP and between strain and SAs.

These limitations lead to singling out potential future developments. First of all, a full three-wave panel design would help clarify the direction of causality between psychophysic strain and JP/SAs.56 Moreover, the relations examined here should be analyzed considering a wider time perspective. It can be hypothesized that with an increase in the interval between time 1 and time 2, the psychophysic symptoms can get even worse, with even more serious consequences for the individual and the organization. It could be interesting to take into account other objective indicators of malaise (eg, actual turnover, disability pension). Finally, the assessment of some physiological indicators (eg, cortisol, cytokines) could help in understanding the mechanisms that regulate the relation between workaholism and psychophysic strain, according to the allostatic load theory.16–17

Possible interventions could concern both the workers and the organization. In suggesting potential interventions, three levels of prevention can be distinguished: primary (ie, reducing the risk of workaholism among workers), secondary (ie, identification and training of the workers at risk of workaholism), and tertiary (ie, minimizing the negative consequences of workaholism on health).58

At the primary level, the occupational physician could suggest to the management interventions aimed at modifying the work environment; in particular, it is advisable to construct practices that permit a better balance between working life and private life, avoiding the allocation of rewards (career, salary rises) purely on the basis of the quantity of work realized.4 As underlined by van Wijhe et al,59 therefore, a change is necessary at the level of organizational culture, which should be primarily aimed at balancing the work and private spheres, and should use reward systems based on working smart rather than hard.

At the secondary level, interventions are highlighted the identification of potential workaholics on the basis of individual characteristics (eg, self-efficacy, neuroticism),4,59 the number of hours worked and the position held (eg, manager, supervisor). In addition, potential workaholics could be encouraged to detach themselves from work and to recover the invested resources. For example, the workers at risk could be encouraged to reduce perseverative cognitions during after-work hours (eg, rumination, worry)18 or to carry out regenerative or relaxing activities during work breaks (eg, physical activity, meditation).16 In addition, training programs aimed at increasing individual psychological resources can be useful to prevent workaholism and favor the development of work engagement (eg, self-esteem, resilience, and active coping style).58–61

At a tertiary level, the occupational physician can implement, either personally or through psychologists or psychotherapists, cognitive–behavioral interventions. For example, one type of intervention could be aimed at helping workaholics to substitute irrational beliefs (eg, “I must respect the deadline at all costs”) with more realistic beliefs (eg, “I will do everything possible to respect the deadline or, otherwise, I will inform my supervisor in good time”) and, consequently, to reduce worries connected to work (cognitive restructuring).59 Another type of intervention could include muscle relaxation techniques to reduce the tension attributable to the negative affective states linked to workaholism.58

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