

WORKPLACE BULLYING AND ITS EFFECT ON SLEEP WELL-BEING: THE MEDIATING ROLE OF RUMINATION

ACOSO LABORAL Y SUS EFECTOS SOBRE EL BIENESTAR DEL SUEÑO: EL ROL MEDIADOR DE LA RUMIACIÓN

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ABSTRACT

There is evidence of the effects of workplace bullying on victims who may manifest symptoms of depression, anxiety, burnout, somatization, and posttraumatic stress; however, few studies have examined the impact of workplace bullying on sleep. The purpose of this study was to examine the relationship between workplace bullying and sleep well-being and how rumination mediates this relationship. A total of 1,046 employed subjects participated in this cross-sectional design study. To examine the hypotheses, a structural equations model was used via the SMARTPLS-3 software. Additionally, the relationship between workplace bullying and sleep well-being was examined by conducting several mediation analyzes to study the mediating role of work-related rumination in the relationship of workplace bullying and sleep well-being. Workplace bullying was inversely and significantly correlated with sleep well-being. The affective rumination was inversely and significantly correlated with sleep well-being, and detachment also correlated significantly, but positively with sleep well-being. However, the problem-solving dimension did not correlate significantly with sleep well-being. Mediation analyzes suggest that affective rumination and detachment mediate the relationship between workplace bullying and sleep well-being. The results of the present study have both theoretical and practical implications. For example, sleep well-being is an important factor in the recovery process and workplace bullying as well as rumination seem to affect the recovery process; thus creating a challenge for psychologists in occupational health contexts and human resources practitioners in the management of this phenomenon in organizations.

KEYWORDS: WORKPLACE Bullying, Sleep Well-Being, Rumination.

RESUMEN

Hay evidencia de los efectos del acoso laboral en sus víctimas, las cuales pueden manifestar síntomas de depresión, ansiedad, agotamiento, somatización y estrés postraumático; Sin embargo, pocos estudios han examinado el impacto del acoso laboral en el sueño. El propósito del presente estudio fue examinar la relación entre el acoso laboral y el bienestar del sueño y cómo la rumiación media esta relación. Un total de 1,046 sujetos empleados participaron en este estudio de diseño transversal. Para examinar las hipótesis, se utilizó el modelo de ecuaciones estructurales mediante el programa SMART-PLS versión 3.0. Además de examinar la relación entre el acoso laboral y el bienestar del sueño, se realizaron varios análisis de mediación para examinar el papel mediador de la rumiación relacionada al trabajo en esta relación. El acoso laboral se correlacionó inversa y significativamente con el bienestar del sueño. La rumiación afectiva se correlacionó inversa y significativamente con el bienestar del sueño, y el desapego también se correlacionó significativamente, pero de forma positiva con el bienestar del sueño. Sin embargo, la dimensión de resolución de problemas no se correlacionó significativamente con el bienestar del sueño. Los análisis de la mediación sugieren que la rumiación afectiva y el desapego median la relación entre el acoso psicológico y el bienestar del sueño. Los resultados del presente estudio tienen implicaciones teóricas y prácticas, entre las que podemos mencionar que el bienestar del sueño es un factor importante en la recuperación de las personas y el acoso laboral, así como la rumiación parecen afectarla, lo cual crea un reto para los psicólogos en el contexto de salud ocupacional y profesionales de los recursos humanos en el manejo de este fenómeno en las organizaciones.

PALABRAS CLAVE: Acoso Psicológico, Bienestar del Sueño, Rumiación.

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Workplace bullying (WB) is a serious global concern; and the Workplace Bullying Institute (WBI; 2014) statistics suggest that 27% of Americans workers are indeed subjected to WB. Moreover, in a recent national study conducted in Puerto Rico by the Workplace Bullying Alliance (WBA) using the same questionnaire used by the WBI, found that 51.8% of workers have experienced WB in the last year (WBA, 2015). Workplace bullying is a significant source of social stressor (Niedl, 1996; Zapf, Knorz, & Kulla, 1996) and it refers to situations in which someone is subjected to long-lasting, recurrent, and serious negative or hostile acts and behavior that are annoying and oppressing (Leymann, 1996; Zapf et al., 1996).

A growing number of studies show that WB has a detrimental effect on the physical and psychological health of the target of such negative acts (Einarsen & Mikkelsen, 2003; Rayner, Hoel, & Cooper, 2002; Rosado Vázquez, 2005; Rosario-Hernández & Rovira Millán, 2011; Rosario-Hernández, 2013). Moreover, bullied employees have reported more symptoms of somatization, depression, anxiety, and negative affectivity than did non bullied employees (Hansen, Hough, & Persson, 2011). In addition, bullied employees have shown posttraumatic stress disorder symptoms like (e.g., Malinauskiene & Einarsen, 2014; Matthiesen & Einarsen, 2004; Rodríguez Muñoz, Moreno Jiménez, Sanz Vergel & Garroza Hernández, 2010; Rosario-Hernández, Rovira Millán, Pons Madera, Rodríguez, & Cordero, 2009; Shalev, 2009).

However, one of the consequences of WB less studied is its effect on sleep well-being. There are a handful of research which have studied the effect of WB on sleep well-being (e.g., Bonde et al., 2012; Hansen, Hough, Garde & Persson, 2014; Lallukka, Rahkonen & Lahelma, 2011; Moreno Jiménez et al., 2008; Rodríguez-Muñoz, Notelaers, & Moreno-Jiménez, 2011), which have found a link between WB and a poor sleep well-being. Moreover, in Puerto Rico there are no studies that examine the effects of WB on sleep well-

being. Therefore, the aim of this study was to examine the effects of WB on sleep well-being. In addition, we wanted to examine the mediating role of rumination in the relation between WB and sleep well-being.

Theoretical framework

We employed the cognitive activation theory of stress (CATS; Ursin & Eriksen, 2004) as a theoretical framework. CATS proposes that sustained arousal, such as rumination, becomes a potential risk for WB victims' health. According to Ursin and Eriksen (2004), physiological arousal is the first response to a stressful situation and is considered adaptive if this is a short-term activation. On the other hand, Geurts & Sonnentag (2006) point out that if the activation is a long-lasting one, the stressful situation becomes a chronic one, and it is more dangerous for health and well-being. This long-lasting activation may deregulate the hypothalamic-pituitary-adrenal (HPA) axis, which McEwen (1998) considered the central stress-physiological system for an organism's long-term adaptation to stress, leading to allostatic load. Thus, in response to the stressful situation increases the arousal prolonging physiological activation, which may lead to the development of health problems. Moreover, this physiological activation may difficult falling asleep creating a vicious cycle of emotional and physiological arousal on sleep (Rodríguez-Muñoz et al., 2011).

Workplace bullying

WB is a collective expression that includes various forms of ill treatment and hostile behaviors in the workplace setting (Fox & Stallworth, 2005). According to Einarsen, Hoel, Zapf, & Cooper (2003), WB is characterized by four main criteria: (1) The target is exposed to direct or indirect negative acts that may range from the subtlest, even unconscious, incivilities to the most blatant, intentional emotional abuse. (2) The negative acts in question are repeated regularly. Therefore, WB is not about isolated episodes

or events but rather about aggressive behavior that is repeatedly directed toward one or more employees. (3) The prolonged nature of the negative experience; that is, the period of time over which the repeated events take place. As for frequency and duration, Leymann (1996) has suggested that the targets must be exposed to at least one negative act on a weekly basis and that the duration of the bullying must be a period of six months or longer. (4) WB is a perceived imbalance of power between the bully and the target. Typically, the target perceives that he/she is incapable of neutralizing or stopping the negative acts to which he or she is being subjected. Thus, WB develops as an escalating process during the course of which the person confronted ends up in an inferior position and becomes the target of systematic negative social acts.

It is important to distinguish WB of interpersonal aggression (IA), IA take the form of individual episodes, while WB is by definition characterized by systematic and prolonged exposure to repeated negative and aggressive behavior of a primarily psychological nature, including non-behavior and acts of social exclusion (Einarsen, Hoel, Zapf, & Cooper, 2011). Einarsen (2000) emphasizes that WB is not just a phenomenon, but rather a gradually evolving process. Furthermore, as opposed to, for instance, the concept of abusive supervision, WB captures aggression from superiors, subordinates, and co-workers alike (Tepper, 2007; Zapf & Einarsen, 2011).

Piñuel y Zabala (2001) indicates that WB has as main objective to intimidate, to reduce, to level, to terrify and to consume emotionally and intellectually the victim with ways to eliminate it from the organization. This objective satisfies the need to attack, to control, or to destroy the victim to channel a series of impulses and tendencies. To accomplish its main objective, Leymann (1996) point out that diverse harassment activities types exist that might include the following: (1) to limit the communication and

the social contact of the employee, (2) to discredit the person before his/her coworkers, (3) to discredit his/her labor and professional capacity, and (4) to carry out acts that compromise his/her health.

Sleep well-being

Sleep is a biological function homeostatically regulated, and is universally experienced as a state of unconsciousness (Mukherjee et al., 2015). Thus, sleep is essential for the restitution of the body and it is vital for the health and well-being of people (Hansen, Hogh, Garde & Persson, 2014). Further, it is known that sleep deprivation is associated with increased risk of disease (Cohen et al., 2009; Nilsson et al., 2005) and stressful situations can cause sleep disturbances and a less refreshing sleep (Åkerstedt et al, 2002; Garde et al, 2011). Brown, Basheer, McKenna, Strecker, and McCarley (2012) points out that humans sleep a third of their lives. Sleep has a prominent role in the recovery, energy conservation and survival on humans (Rechtschaffen, Bergmann, Everson, Kushida & Gilliland, 1989). It also seems important on vital functions such as neural development, learning, memory, emotion regulation, cardiovascular and metabolic functions, and in removing toxins (Cincin et al., 2015; Davies et al., 2014; Xie et al., 2013).

Poor sleep well-being is prevalent in the general as well as the working population (Luckhaupt, 2012; Metlaine, Leger, & Choudat, 2005; Ohayon, 2002; Van Laethem, Beckers, Kompier, Dijksterhuis, & Geurts, 2013). According to Moreno Jiménez et al. (2008), insomnia is considered the most common sleep disorder. Some studies have found elevated ratios of insomnia on WB victims (Björkqvist et al., 1994; Leymann & Gustafsson, 1996). Moreover, Notelaers, Einarsen, De Witte & Vermunt (2006) found that WB victims presented worse sleep quality, while Vartia (2001) found that WB victims significantly took more sleep medications. Meanwhile, a poor sleep well-being has been associated to physical as well as mental problems (e.g., Edell-Gustafsson,

Kritz & Bogren, 2002; Nakata et al., 2000). For example, Schwartz et al. (1999) conducted a meta-analysis and found that people with a poor sleep well-being is associated with an increased risk of heart attack as well as suffering from cardiovascular diseases.

Sleep is a crucial period for recovery. While we consume much of our time sleeping, sleep is a critical period for both psychological and physical restorative processes (Brosschot, Van Dijk & Thayer, 2007). Indeed, impediments to recover from work stress can damage the health of employees (e.g., Fritz, Sonnentag, Spector & McInroe, 2010; Kivimaki et al., 2006; Meijman & Mulder, 1998; Schwartz et al., 2003; Zijlstra & Sonnentag, 2006). However, the recovery process appears to be influenced by the way in which people are able to disconnect from job demands and thoughts related to it (Cropley, Dijk & Stanley, 2006; Sonnentag, Mojza, Binnewies, & Scholl, 2008; Sonnentag & Zijlstra, 2006; Rook & Zijlstra, 2006). Thus, a suggested mechanism that can endanger to disconnect successfully is rumination (Cropley et al., 2006; Roger & Jamieson, 1988).

Rumination

Rumination is one of the factors thought to interfere with sleep (Querstret & Cropley, 2012). Martin and Tesser (1996) conceptualize rumination as a kind of thinking awareness that revolves around an instrumental common theme that is repeated in the absence of the environmental demands that required such thoughts. In work context, rumination can be considered as a set of thoughts directed to issues related to work and are repetitive in nature (Cropley & Zijlstra, 2011).

It really does not matter if a person thinks and ruminates on job issues when not at work, and indeed many people do this because it is rewarding and stimulating. As well there may be benefits to think about work when people are not working (Cropley & Zijlstra, 2011).

Rumination only becomes a problem when it affects the health and well-being. Cropley and Zijlstra suggest that people do not always worry or think negatively about their work in their free time. Thinking about work certainly is not compatible to be detached or disconnected, and therefore, this makes it difficult to recover from work. Nevertheless, thinking and reflecting about work can also have beneficial effects and it can be associated to positive results. In this way, and incorporating this notion, Cropley and Zijlstra conceptualized rumination related to work as a construct with three components. The first component of work-related rumination, according to Cropley and Zijlstra, is affective rumination. Affective rumination is a cognitive state characterized by the appearance of intrusive, penetrating, and recurring thoughts about work. These thoughts are negative in emotional terms (Pravettoni, Cropley, Leotta & Bagnara, 2007). If these thoughts about work are not controlled, they become cognitively and emotionally intrusive during free time. While Cropley and Zijlstra point out that most studies related to rumination focused on their negative aspects, implying that if people think about their work during the night means they are cognitively with "the power button on" in relation to their jobs, preventing them to recover overnight or during weekends. Clearly the inability to recover has a negative impact on workplace functioning. However, thinking about problems at work does not necessarily have negative implications, since such thoughts can also have a positive side representing second component of work-related rumination, i.e., problem-solving pondering. Cropley and Zijlstra indicate that problem-solving pondering is a way of thinking that can be characterized by mental extended scrutiny of a previous particular work problem in order to find a solution, but does not involve the emotional process that affective rumination incites. Finally, detachment is the third component of work-related rumination and can be defined as a sense of being away from the employment status (e.g., Etzion, Eden & Lapidot, 1998). Zijlstra and Cropley indicate

that there are people that are able to push the "off button" and can disconnect and forget about work.

Workplace bullying and sleep well-being

Niedhammer et al. (2009) conducted a study with a sample of 7,694 workers and found that being victim of WB was associated to a poor sleep well-being. Moreover, past WB experience increases the risk of a poor sleep well-being among female workers. While Lallukka, Rahkonen and Lahelma (2011) carried out a research as part of the Helsinki health study in Finland with a sample of 7,332 workers. They found that exposure to WB is associated with subsequent sleep problem at follow-up. The odd ratio on women was OR=1.69 and in men was OR=3.17. However, when they adjusted for age, childhood bullying, education, physical, psychosocial working conditions, and obesity somewhat attenuated the associations. In a study performed in Denmark with a sample of 3,382 workers, Hansen, Høgh, Garde and Persson (2014) found that workers exposed to WB, both occasionally and frequently (OR=5.22 and OR=3.56, respectively), presented poor sleep well-being. This study results brought attention to the occasional exposure to WB workers as a relevant group. In another study from Denmark with a sample of 3,435 workers, Bonde et al. (2016) found that WB exposure is associated to a poor sleep well-being at the base-line. Sleep well-being improved after a four year follow-up; however, some maintained problems waking-up or not having a restorative sleep. Based on our review of the literature, the following hypotheses were proposed:

- > H_{1a}: Workplace bullying will have a negative relation to sleep quantity.
- > H_{1b}: Workplace bullying will have a negative relation to sleep quality.

Work-related rumination and sleep well-being

There is literature that suggests that in trying to remove unwanted thoughts out of consciousness, what it does is put them

more accessible (Erber & Werner, 1996; Wegner, Schneider, Carter & White, 1987). According Cropley and Zijlstra (2011), due to circumstances in which people experience negative emotional reactions manifested in the form of stress, annoyance or anger have a negative effect on the recovery process. Previous studies have shown that detachment from work is associated to being positive and low fatigue (e.g., Sonnentag & Bayer, 2005; Sonnentag, Mojza, Binnewies & Scholl, 2008). Cropley and Zijlstra state that employees who are capable of detaching from work can have a balance healthy and work life. Also, they add that it is conceivable that these employees who are detached from their work strive to be in control in other areas of their lives to safeguard their well-being. Thus, there is evidence that suggests that work-related to rumination is associated with a number of health problems, including cardiovascular diseases (e.g., Kivimaki et al., 2006; Suadicani, Hein & Gyntelberg, 1993), negative mood (e.g., Pravettoni, et al 2007), secretion cortisol in saliva (Rydstedt, Cropley, Devereux & Michalianou, 2009) and sleep disorders (Åkerstedt et al., 2002; Berset, Elfering, Luthy, Luthi, & Semmer, 2011; Cropley et al., 2006; Groeger, Zijlstra & Dijk, 2004; Nysten et al., 2007). For example, a prospective study found that men who reported being unable to relax after work, had an triple the risk to suffer heart disease (Suadicani et al., 1993). Another study showed that experiencing persistent thoughts about work were three times more likely to develop sleep disturbances, compared with those who did not (Åkerstedt et al., 2002). In Puerto Rico, Rosario-Hernández et al. (2015) found that affective rumination predicted a poor sleep well-being. Thus, the following hypotheses were proposed:

- > H_{2a}: Affective rumination will have a negative relation to sleep quantity.
- > H_{2b}: Affective rumination will have a negative relation to sleep quality.
- > H_{3a}: Problem-solving pondering will have a negative relation to sleep quantity.

- > H_{3b}: Problem-solving pondering will have a negative to sleep quality.
- > H_{4a}: Detachment will have a positive relation to sleep quantity.
- > H_{4b}: Detachment will have a positive relation to sleep quality.

Work-related rumination as a mediator

Cropley and Zijlstra (2011) indicate that one thing people may do when they are not at work is that they may 'ruminate' (think about work-related issues and events). Some may think about tasks they have left uncompleted, others ruminate about a problem that needs to be solved, and still others think about relationship issues with colleagues or negative events at work. People do not just think about events or issues that have already occurred, but they also ruminate anticipatively, about upcoming events/demands and issues they may be expecting at work.

The central argument in relation to perseverant cognitions indicates that for a person to be able to relax after a stressful work day, it can be harmed if stressful experience is relived during the free-time (Vahle-Hinz, Bamberg, Dettmers, Friedrich & Keller, 2014). Indeed, job stress is associated to psychological and physiological responses even after the people have left their jobs (Frankenhaeuser, 1981).

Moreno Jiménez, Rodríguez Muñoz, Sanz Vergel and Rodríguez Carvajal (2008) conducted a study in Spain with 511 workers and found that WB was positive associated to insomnia. Rumination and psychological detachment were found to moderate the relation between WB and insomnia. While psychological detachment buffers the relationship, rumination exacerbates the relation between WB and insomnia. Based on these findings, we argue that ruminative process variables, in this case affective rumination, problem-solving pondering and detachment will intervene in the relation

between WB and sleep well-being; in this case, affective rumination will impact negatively sleep well-being due to its emotional load, while problem-solving pondering and detachment will enhance sleep well-being because they do not have that emotional load in the ruminative process that its related health problems (Cropley & Zijlstra, 2011). Therefore, the following hypotheses were proposed:

- > H_{5a}: Affective rumination will mediate negatively the relation between workplace bullying and sleep quantity.
- > H_{5b}: Affective rumination will mediate negatively the relation between workplace bullying and sleep quality.
- > H_{6a}: Problem-solving pondering will mediate negatively the relation between workplace bullying and sleep quantity.
- > H_{6b}: Problem-solving pondering will mediate negatively the relation between workplace bullying and sleep quality.
- > H_{7a}: Detachment will mediate positively the relation between workplace bullying and sleep quantity.
- > H_{7b}: Detachment will mediate positively the relation between workplace bullying and sleep quality.

METHOD

Participants

A convenience sample of 1,046 workers participated in this cross-sectional study. Participants in the study were enrolled from different private and public organizations in Puerto Rico. As presented on table 1, the sample of the study was composed of 59.4% (621) females, age mean was 37.73, while education mean was 16.05, which it is equivalent to a bachelor' degree. In terms of tenure, 73.9% (773) had a permanent one, and 65.6% (686) of the research participants worked for a private organization.

TABLE 1.
Socio-demographic information about the sample.

| Variable | n | % | Variable | n | % |
|-----------------|-----|------|----------------------|-------|-------|
| Gender | | | Type of Organization | | |
| Male | 424 | 40.5 | Public-State | 281 | 26.9 |
| Female | 621 | 59.4 | Public-Federal | 54 | 5.2 |
| Marital Status | | | Private | 686 | 65.6 |
| Single | 358 | 34.2 | Intention to Leave | | |
| Married | 443 | 42.4 | Not at All Likely | 485 | 46.4 |
| Widowed | 14 | 1.3 | Unlikely | 290 | 27.7 |
| Divorced | 113 | 10.8 | Somewhat Likely | 184 | 17.6 |
| Living Together | 111 | 10.6 | Very Likely | 75 | 7.2 |
| Position Type | | | | Mean | SD |
| Management | 197 | 18.8 | Age | 37.73 | 11.08 |
| Non-Management | 796 | 76.1 | Education | 16.05 | 2.30 |
| Tenure | | | Time Working | 8.75 | 8.33 |
| Permanent | 773 | 73.9 | | | |
| Temporary | 233 | 22.3 | | | |

Note: n=1,046; SD=Standard Deviation.

Materials

Background questionnaire. We created a background questionnaire to gather information about the research participants. In this background questionnaire we asked the participants to provide information about their gender, age, tenure, marital status, among others, to enable us to describe the subjects of the study.

Workplace bullying. To measure exposure to workplace bullying, we used the Leymann Inventory of Psycho-Terror (LIPT-60; González de Rivera y Revuelta & Rodríguez-Abuín, 2003). The self-report rating scale is 0-4 for each of the 60 bullying at work strategies in which the descriptors are: "Not at all," "A little bit," "Moderately," "Quite a bit," and "Extremely." The inventory includes questions related to different WB strategies that have been identified and grouped as Work Discredit, Impeding Progress, Blocking Communication, Covert Intimidation, Manifest Intimidation, and Personal Discredit. Reliability of the LIPT-60 and its subscales using Cronbach's alpha have been reported between .74 and .97 in some studies in Puerto Rico (Ríos-Pérez, Rosario-Hernández, González Valles, Rosario Nieves, & Rovira Millán, 2011; Rosario-Hernández et al., 2009; Rosario-Hernández & Rovira Millán, 2011). According to González de Rivera y Revuelta

and Rodríguez-Abuín (2003), the internal structure of LIPT-60 has been supported by several factor analyses and correlations with other measures also support its validity.

Rumination. To measure rumination, we used the Work-Related Rumination Scale (Cropley, Michalianou, Pravettoni, & Millward (2012). The scale is composed of three subscales of five-items each, which are affective rumination, problem-solving pondering, and detachment. The response format is a Likert five-point scale ranging from 1 (Very rarely / never) to 5 (Very Often / always), and each subscale produces a total score that can range from 0 to 25. According to the authors, internal structure of the scale has been examined through factor analysis technique, which support the three dimension components. Reliability of the scale using Cronbach's alpha has been reported to range from .81 to .90.

Sleep well-being. We used the Sleep Well-Being Indicator developed by Rovira Millán and Rosario-Hernández (2018) to measure sleep well-being. This indicator is a twelve-items instrument in a Likert-frequency response format ranging from 1 (Never) to 6 (Always). This indicator has three subscales which are sleep quantity (duration), sleep quality, and consequences related to sleep. Authors report reliability through Cronbach's alpha and

ranged from .79 to .86. Factor analysis results support the internal structure of three dimensions. It is important to mention that only the sleep quantity and sleep quality subscales were used in the present study.

Procedure

The research proposal was submitted to the Institutional Review Board (IRB) of the Ponce Health Sciences University and it was approved on February 10, 2016 with the protocol number 160208-ER. Participants were contacted from different organizations and were invited to participate in the study. All those who agreed to participate in the study were explained the purpose of the research. They were given the consent form, background data sheet and the study questionnaires. The questionnaires were administered individually as well as in groups by the researchers at the different organizations contacted.

Data analysis

For data analysis, partial least squares structural equation modeling (PLS-SEM) was used following the two step procedure suggested by Hair, Hult, Ringle, and Sarstedt (2017) using SMART-PLS v.3 program. First, confirmatory factor analysis aimed to assess the measuring model; and secondly, evaluation of the structural model. It is important to mention the two reasons for its use in the present study, as Chin (2010) points out, that PLS-SEM has a soft distributional assumption and given that the Kolmogorok-Smirnov and Shapiro-Wilks tests were significant suggesting that scores were not distributed normally. Also, the high model complexity of the study justifies the use of PLS-SEM because the model tested has multiple mediators.

In terms of assessing the significance of the direct and the total indirect effect was immediately done using the SMART-PLS v.3 output. In multiple mediation models as in the current study, however, the total indirect effect consisted of several specific indirect effects.

Assessing the significance of specific indirect effects required manually calculating each effect's standard error. For this purpose, we used the SMART-PLS v.3 results report from the bootstrapping routine and simply copied pasted the path coefficients of all bootstrap samples into IBM SPSS version 21 and manually calculated the specific indirect effects of all bootstrapping samples. By using the manually calculated bootstrapping results as input, we computed the standard error, which equals the standard deviation in bootstrapping of each specific indirect effect in the multiple mediation models. We divided the specific indirect effect as obtained when multiplying the direct effects from standard PLS-SEM analysis of the path model by the standard error and this yielded the t value of the specific indirect effect. All t values equal or greater than 1.96 were considered significant (see Hair et al., 2017, p. 238).

RESULTS

The research model of fig. 1 was analyzed using Smart-PLS v.3, a PLS structural equation-modeling tool (Ringle, Wende, & Becker, 2015). It assesses the psychometric properties of the measurement model, and estimates the parameters of the structural model. This tool enables the simultaneous analysis of up to 200 indicator variables, allowing the examination of multiple mediator variables simultaneously among latent predictor variables indicators.

The measurement model

The data indicates that the measures are robust in terms of their internal consistency reliability as indexed by Cronbach's alpha and composite reliability. All the Cronbach's alphas and the composite reliabilities of the different measures range from .77 to .96, which exceed the recommended threshold value of .70 (Hair et al., 2017). In addition, consistent with the guidelines of Fornell and Larcker (1981), the average variance extracted (AVE) for each measure exceeds .50, which is an indication of the convergent validity of the measures. Moreover, the

elements in the matrix diagonals, representing the square roots of the AVE, are greater in all cases than the off-diagonal elements in their corresponding row and column, supporting

the discriminant validity of the scales (see table 2).

TABLE 2.

Correlation matrix between latent constructs, Cronbach's alpha, composite reliability (CR) and the average variance extracted (AVE).

| Measures | α | CR | AVE | 1 | 2 | 3 | 4 | 5 | 6 |
|------------------------------|----------|-----|-----|-------|-------|-------|-------|-------|-------|
| 1. Workplace Bullying | .92 | .94 | .73 | (.85) | | | | | |
| 2. Affective Rumination | .88 | .91 | .67 | .28 | (.82) | | | | |
| 3. Problem-Solving Pondering | .76 | .83 | .51 | -.02 | .57 | (.71) | | | |
| 4. Detachment | .79 | .85 | .54 | -.08 | -.55 | -.37 | (.73) | | |
| 5. Sleep Quantity | .84 | .90 | .76 | -.24 | -.27 | -.10 | .21 | (.87) | |
| 6. Sleep Quality | .84 | .90 | .75 | -.23 | -.39 | -.26 | .31 | .41 | (.87) |

Note: n=1,046; *p<.05, **p<.01; the elements in the matrix diagonals within parenthesis represent the square roots of the AVE; α =Cronbach's Alpha

Another approach to examine discriminant validity of the indicators are the cross-loadings; specifically, an indicator's outer loading on the associated construct should be greater than any of its cross-loading on other constructs (Hair et al., 2017). These results,

presented in table 3, indicated that all item loaded on their respective construct form a lower bound -.61 to an upper bound of .96, and more highly on their respective construct than any other.

TABLE 3.

Outer loadings and cross-loadings for the indicators of each measurement.

| Indicator | AR | Det | PSP | S. Qual | S. Quan | WB |
|-----------|------------|------------|------------|------------|------------|------------|
| AR-1 | <u>.85</u> | -.49 | .46 | -.38 | -.28 | .22 |
| AR-5 | <u>.81</u> | -.52 | .69 | -.32 | -.18 | .12 |
| AR-7 | <u>.85</u> | -.59 | .52 | -.36 | -.20 | .15 |
| AR-9 | <u>.86</u> | -.44 | .41 | -.31 | -.23 | .31 |
| AR-15 | <u>.71</u> | -.16 | .26 | -.18 | -.22 | .35 |
| Det-3 | -.46 | <u>.76</u> | -.35 | .23 | .19 | -.04 |
| Det-6 | -.61 | <u>.70</u> | -.46 | .28 | .14 | -.05 |
| Det-10 | -.16 | <u>.65</u> | -.11 | .18 | .08 | -.03 |
| Det-12 | -.31 | <u>.76</u> | -.19 | .21 | .11 | -.04 |
| Det-14 | -.36 | <u>.79</u> | -.19 | .25 | .22 | -.12 |
| PSP-2 | .40 | .27 | <u>.80</u> | -.23 | -.05 | -.03 |
| PSP-4 | .48 | -.35 | <u>.84</u> | -.25 | -.08 | -.03 |
| PSP-8 | .52 | -.35 | <u>.83</u> | -.21 | -.11 | -.01 |
| PSP-11 | .27 | -.11 | <u>.57</u> | -.08 | .01 | -.08 |
| PSP-13 | .30 | -.04 | <u>.43</u> | -.04 | -.11 | .09 |
| S.Qual-1 | -.33 | .27 | -.23 | <u>.83</u> | .36 | -.21 |
| S.Qual-4 | -.35 | .27 | -.24 | <u>.89</u> | .37 | -.19 |
| S.Qual-9 | -.33 | .29 | -.20 | <u>.88</u> | .33 | -.21 |
| S.Quan-2 | -.28 | .24 | -.11 | .42 | <u>.88</u> | -.22 |
| S.Quan-5 | -.19 | .13 | -.07 | .29 | <u>.84</u> | -.21 |
| S.Quan-8 | -.23 | .16 | -.06 | .34 | <u>.88</u> | -.21 |
| WB-1 | .31 | -.11 | -.01 | -.24 | -.26 | <u>.92</u> |
| WB-2 | .18 | -.02 | -.09 | -.16 | -.18 | <u>.83</u> |
| WB-3 | .28 | -.11 | .02 | -.26 | -.19 | <u>.90</u> |
| WB-4 | .20 | -.05 | -.02 | -.18 | -.17 | <u>.79</u> |
| WB-5 | .25 | -.07 | -.04 | -.18 | -.23 | <u>.85</u> |
| WB-6 | .20 | -.03 | .01 | -.15 | -.17 | <u>.81</u> |

Note: AR=Affective Rumination, Det=Detachment, PSP=Problem-Solving Pondering, S. Qual.= Sleep Quality, S. Quan=Sleep Quantity, WB=Workplace Bullying.

Henseler et al. (2015) propose assessing the heterotrait-monotrait ratio (HTMT) of the correlations to also examine discriminant validity. The HTMT approach is an estimate of what the true correlation between two constructs would be, if they were perfectly measure. A correlation between two constructs close to one indicates a lack of discriminant validity. Therefore, Henseler et al. suggest a threshold value of .90 if the path model includes constructs that are conceptually very similar. In other words, a HTMT above .90 suggest a lack of discriminant validity. Correlations between constructs appear on table 4, all correlations are below the threshold of .90, suggesting the discriminant validity of the measures. Also, since the HTMT can serve as the basis of a statistical discriminant validity test. Henseler et al.

(2015) recommend the use of bootstrapping technique to derive a bootstrap with a 95% confidence interval with 5,000 random subsamples. Thus a confidence interval containing the value of one indicates a lack of discriminant validity. Conversely, if the value of one falls outside the interval's range, this suggests that the two constructs are empirically distinct. Since HTMT-based assessment using confidence interval relies on inferential statistics, one should primarily rely on this criterion. In the present study, none of the correlation between the constructs in the bootstrapping 95% confidence interval included the value of one; therefore, this suggests that the constructs are empirically distinct (see table 4).

TABLE 4.
Heterotrait-Monotrait ratio of correlations (HTMT).

| Measure | WB | AR | PSP | Det | S. Quan | S. Qual |
|---------------------------------|---------------------|---------------------|---------------------|-------------------|-------------------|---------|
| Workplace Bullying (WB) | | | | | | |
| Affective Rumination (AR) | .30 [.20; .31] | | | | | |
| Problem-Solving Pondering (PSP) | .09 [-.23; -.14] | .68 [.57; .68] | | | | |
| Detachment (Det) | .08 [-.04; -.14] | .62 [-.67; -.60] | .43 [-.08; -.09] | | | |
| Sleep Quantity (S. Quan) | .27 [-.23; -.12] | .31 [-.27; -.09] | .13 [-.03; .13] | .24 [.03; .20] | | |
| Sleep Quality (S. Qual) | .30 [-.25; -.13] | .48 [-.34; -.16] | .27 [-.10; .05] | .37 [.06; .20] | .47 [.26; .39] | |

Note: Elements in the brackets are the Confident Intervals of .90 of the HTMT's criteria for correlations.

The structural model

After the measurements were tested for validity, the structural model as provided in Figure 1, which represent the relations among the constructs assumed in the theoretical model or latent variables, was tested. In order to examine the structural model and as recommended by Hair et al. (2017), first, we checked the structural model for collinearity issues by examining the variance inflation factor (VIF) value of all sets of predictor constructs in the structural model. They fluctuated between 1.000 and 2.052, all VIF values are clearly below the threshold of 5;

therefore, collinearity among predictor constructs is not a critical issue in the structural model (see table 5). Also, table 5 shows the R^2 values of sleep quantity (.114) and sleep quality (.190), explaining 11.4% and 19.0% of the variance, respectively. Also, all Q^2 values of sleep quantity and sleep quality are above zero (.081 and .121, respectively). Providing support of the model's predictive relevance regarding the endogenous latent variables. The effects sizes for workplace bullying achieved f^2 values of .03 on both sleep quantity and quality, which exceeds the minimum threshold of .02 (Chin, Marcolin, & Newsted, 2003). While effect sizes for

ffective rumination achieved the minimum threshold on both endogenous latent variables and detachment achieved the minimum threshold of .02 on sleep quality. On

the other hand, effect sizes for problem-solving pondering did not achieved the minimum threshold of .02 in either one.

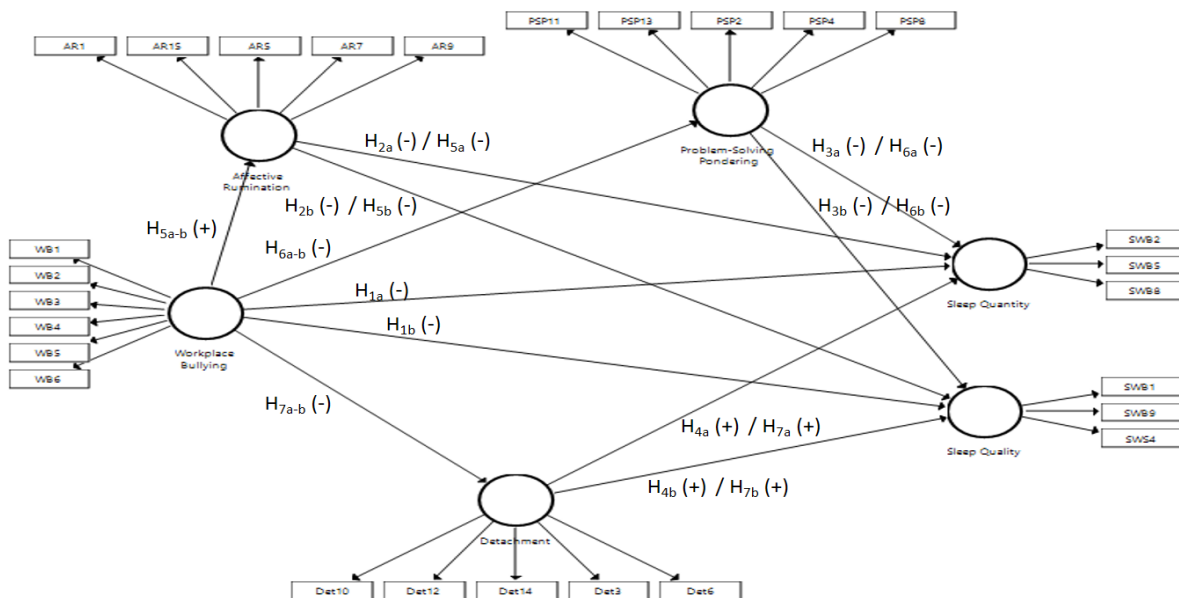


FIGURE 1. Proposed research model.

TABLE 5. Structural model results.

| Latent Construct | R ² | Adj. R ² | f ² | | Q ² | VIF |
|---------------------------|----------------|---------------------|----------------|---------|----------------|-------|
| | | | S. Quan | S. Qual | | |
| Workplace Bullying | | | .03 | .03 | | 1.155 |
| Affective Rumination | | | .02 | .02 | | 2.081 |
| Problem-Solving Pondering | | | .00 | .01 | | 1.557 |
| Detachment | | | .01 | .02 | | 1.440 |
| Sleep Quantity (S. Quan) | .114 | .110 | | | .081 | |
| Sleep Quality (S. Qual) | .190 | .187 | | | .140 | |

Figure # 2 and table 6 show the structural model results and the beta values of all path coefficients are also shown. WB had negative significant relation to sleep quantity and sleep quality (beta= -.177, $p < .01$, beta= -.166, $p < .01$, respectively). Affective rumination has negative significant relation to sleep quantity and sleep quality (beta= -.187, $p < .01$, beta= -.200, $p < .01$, respectively). While problem-solving pondering has a positive non-significant relation to sleep quantity and sleep quality (beta= .048, $p = .30$, beta= -.094, $p <$

.01, respectively). Whereas detachment had positive relation to sleep quantity and sleep quality (beta= .115, $p < .01$, beta= .157, $p < .01$, respectively).

In terms of the mediating role of rumination, we found that the three dimensions of work-related rumination as a whole mediated the relation between WB and sleep well-being. The indirect effects on sleep quantity and sleep quality were negative and significant (-.064 & -.067, respectively). As

individual mediators, affective rumination was significant mediating WB on sleep quantity as well as on sleep quality obtaining significant indirect effects (-.053 & -.057, respectively). Meanwhile detachment was a significant mediator between WB and sleep quality

obtaining an indirect effect of -.013. On the other hand, problem-solving pondering did not mediate the relation between WB and sleep well-being in terms of duration and quality of the sleep (see table 7).

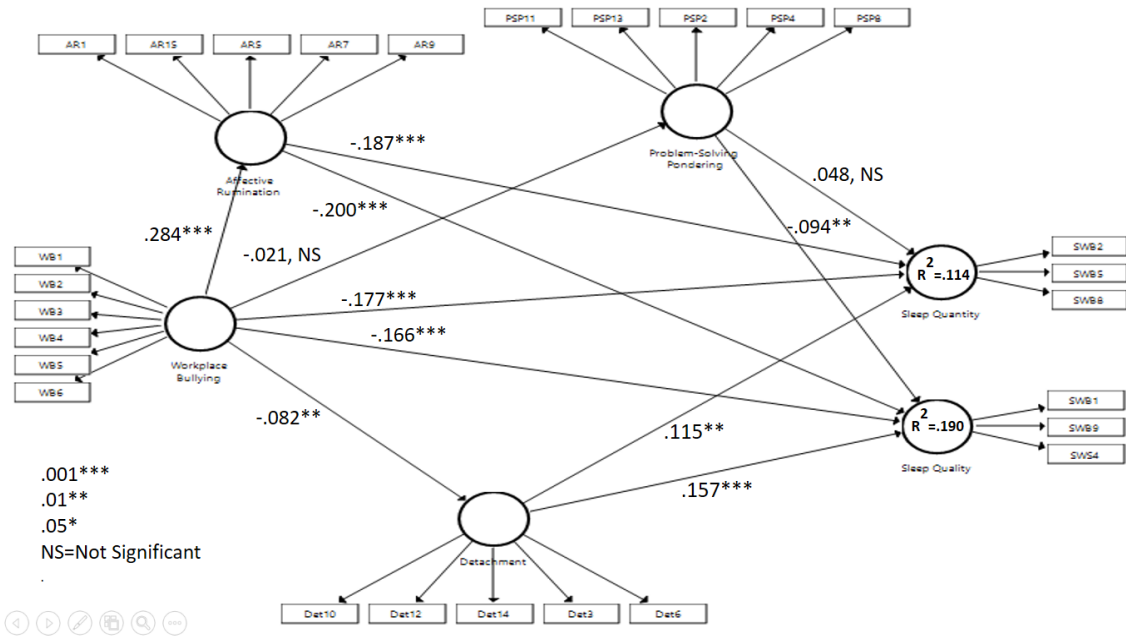


FIGURE 2. Path coefficients.

TABLE 6. Hypotheses results and conclusions.

| Hypotheses | Results | Conclusion |
|---|-------------------|---------------|
| Hypothesis 1 | | |
| H1a: Workplace bullying will have a negative relation to sleep quantity. | $b = -.177^{***}$ | Supported |
| H1b: Workplace bullying will have a negative relation to sleep quality. | $b = -.166^{***}$ | Supported |
| Hypothesis 2 | | |
| H2a: Affective rumination will have a negative relation to sleep quantity. | $b = -.187^{***}$ | Supported |
| H2b: Affective rumination will have a negative relation to sleep quality. | $b = -.200^{***}$ | Supported |
| Hypothesis 3 | | |
| H3a: Problem-solving pondering will have a negative relation to sleep quantity. | $b = -.048, NS$ | Not Supported |
| H3b: Problem-solving pondering will have a negative relation to sleep quality. | $b = -.094^{**}$ | Supported |
| Hypothesis 4 | | |
| H4a: Detachment will have a positive relation to sleep quantity. | $b = .115^{**}$ | Supported |
| H4b: Detachment will have a positive relation to sleep quality. | $b = .157^{***}$ | Supported |

TABLE 7.
Individual mediation hypotheses result, conclusion, and type of mediation.

| Hypotheses | Results of Indirect Effects (t Value) | Conclusion | Mediation (Yes / No; Type) |
|---|---------------------------------------|---------------|----------------------------|
| Hypothesis 5 | | | |
| H _{5a} : Affective rumination will mediate negatively the relation between workplace bullying and sleep quantity. | -.053, (-3.55*) | Supported | Yes (Complementary) |
| H _{5b} : Affective rumination will mediate negatively the relation between workplace bullying and sleep quality. | -.067, (-4.07*) | Supported | Yes (Complementary) |
| Hypothesis 6 | | | |
| H _{6a} : Problem-solving pondering will mediate negatively the relation between workplace bullying and sleep quantity. | -.001, (-0.429, NS) | Not Supported | No |
| H _{6b} : Problem-solving pondering will mediate negatively the relation between workplace bullying and sleep quality. | .001, (0.544, NS) | Not Supported | No |
| Hypothesis 7 | | | |
| H _{7a} : Detachment will mediate positively the relation between workplace bullying and sleep quantity. | -.009, (-1.92, NS) | Not Supported | No |
| H _{7b} : Detachment will mediate positively the relation between workplace bullying and sleep quality. | -.013, (-2.33*) | Supported | Yes (Competitive) |

DISCUSSION

The aim of this study was to examine the relation between WB and sleep well-being and how this relation was mediated by work-related rumination. The results shown support to our first hypotheses in which WB has a negative relation to sleep quantity and quality. These results are consonant with the literature (e.g., Bonde et al., 2012; Hansen, Hough, Garde & Persson, 2014; Lallukka, Rahkonen & Lahelma, 2011; Moreno Jiménez et al., 2008; Rodríguez-Muñoz et al., 2011) that also found that WB has an impact on sleep well-being. These results suggest that WB has a negative impact on both sleep quantity and sleep quality. It is clear that WB is a significant source of social stressor (Niedl, 1996; Zapf, Knorz, & Kulla, 1996), but there are studies that also consider a poor sleep as a stressful condition (Åkerstedt, Palmblad, de la Torre, Marana & Gillberg, 1980; Bonnet, 1994; Davidson, Moldofsky, & Lue, 1991; Kant, Genser, Torne, Pfalser, & Mougey, 1984; Follenius, Brandenberger, Badasept, Libert, & Ehrhart, 1992). In this way, this relation between WB and a poor sleep well-being is important in the area of occupational health psychology because both variables individually have been related to physical and mental health problems (e.g., Einarsen & Mikkelsen, 2003; Kivimaki et al., 2006;

Pravettoni, et al 2007; Rayner, Hoel, & Cooper, 2002; Rosado Vázquez, 2005; Rosario-Hernández & Rovira Millán, 2011; Rosario-Hernández, 2013; Rydstedt et al., 2009) and together may have such a negative impact on employees' physical and mental health.

Hypotheses 2 through 4 for the three dimensions of work-related rumination have a significant relation to sleep well-being, except the relation between problem-solving pondering and sleep quantity. As expected, affective rumination and problem-solving pondering related negatively to sleep well-being; while detachment related positively to both dimensions of sleep well-being. Moreno Jiménez et al. (2008) had similar results in which rumination and detachment predicted insomnia, where the first relation was positive and the latter negative. In other words, in the current study affective rumination impoverishes sleep well-being while detachment enhances it. Therefore, affective rumination appears to cognitive activates a physiological response of WB victims leading to poor sleep well-being.

In terms of hypotheses 5 through 7, which examined the mediating role of work-related rumination in the relation of WB and sleep well-being, we found that work-related

rumination as a whole mediated significantly these relations. However, when we examined the three components of work-related rumination individually, we found that affective rumination negatively (complementarily) and partially mediates the relations of WB on sleep quantity and sleep quality. On the one hand, the indirect effect and the direct effect both are significant and point in the same direction; in this case, affective rumination and WB are negatively related to both sleep quantity and sleep quality. On the other hand, detachment positively (competitively) and partially mediates the relation between WB and sleep quality. In other words, the indirect effect and the direct effect both are significant and point in opposite directions. In this case, detachment is positively related to sleep quality; in contrast, WB is negatively related to sleep quality. The results suggest that if someone is highly exposed to WB, he or she is likely to report lower sleep well-being. This relationship is partially explained detailing the involvement of affective rumination. In essence, individuals who reported higher levels of exposure to WB reported higher levels of ruminative process, and in turn, individuals who ruminate report lower levels of sleep well-being. On the contrary, individuals exposed to WB who can detach or disconnect from work, in this case, from such negative acts, have better sleep well-being. As shown above, the exposure to WB has an effect on sleep well-being and depending upon which intervene variable excels in the WB victim (rumination or detachment), that effect might be positive or negative on sleep well-being. These results are similar to Moreno Jiménez et al. (2008), who found that rumination exacerbated the relation between WB and insomnia, while detachment buffered this relationship. Miller et al. (2003) and Moreno Jiménez et al. (2008) indicate that affective rumination appears to reactivate the WB experience making the person re-experience the emotions associated to the event. Moreover, there is some evidence that people who ruminated about an interpersonal aggression, presented higher cortisol levels (McCullough, Orsulak, Brandon & Akers,

2007). Thus, we concur with Moreno Jiménez et al. that a plausible explanation is that the excessive physiological activation from rumination interferes with sleep well-being; therefore, it is important to remember that HPA system follows a clear circadian rhythm in which, according to Baum and Grunberg (1995), is shown with the highest levels of cortisol in the early morning and continuous decrease over the course of the day to reach its nadir after midnight.

In addition, Rachman (1980) states that insomnia may appear as result of an insufficient emotional process related to the stressful event. Furthermore, Baillien, Neyens, De Witte and De Cupier (2009) propose that some maladaptive ways of coping, such as rumination, may worsen the process. On the other hand, detachment appears to enhance sleep quality. In this way, Etzion et al. (1998) point out that detachment is a very important factor that enable the WB victim to recover somehow from the stressful event and improve well-being, in this case the sleep quality.

Limitations and recommendations

The current study has several shortcomings that must be kept in mind when interpreting the results. First, the fact that we used self-reports to measure all the variables, which may increase the risk of common method variance. However, we conducted a common method variance (CMV) analysis using SPSS and the results shown that CMV was only 23.99%, which is well below the threshold of 50% (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Furthermore, sleep duration was also obtained by self-report and was not corroborated by actigraphy (sensor-measurement of motor activity), polysomnography (sleep study), other objective measures, or sleep journals (Liu et al., 2016); therefore, the use of objective measures of sleep are recommended in future research on sleep well-being. Second, the cross-sectional design of our study does not allow us to conclude in terms of causal relationships. The use of a longitudinal design

will offer more information in terms of the impact of workplace bullying on sleep well-being in a long-term. However, the information obtained from the results of the study gives us an idea of the impact of workplace bullying on sleep well-being, specially in a Puerto Rican sample. Finally, we concord with Bonde et al. (2016), who indicate that it is important to keep in mind that variation of poor sleep well-being is influenced by numerous work and non-work related social and psychological factors other than bullying. Thus, giving the high prevalence of WB in Puerto Rico (WBA, 2015), and its apparent impact on sleep, these other factors (e.g., family and personal conflicts, organizational constraints, job demands, etc.) should be considered in future research to better understand bullying at work and its effect on sleep.

Theoretical and Practical Implications

CATS (Ursin & Eriksen, 2004) as a theoretical framework appears to explain the results of this study given that rumination function as a cognitive activation which has an impact in the relation between workplace bullying and sleep well-being. Brosschot, Gerin, and Thayer (2006) argue that continuing to think about work related issues and not being able to recover sufficiently may increase arousal, this may short sleep duration and result in poor sleep quality. Thus, according to CATS, cognitive activation, such as work-related rumination, constitutes an important determinant of prolonged physiological activation, and serves as a mediator of the relationship between workplace bullying and sleep well-being.

In terms of practical implications and following the basic recommendations by Watson et al. (2015) to the general public and applying these to organizations, we recommend that psychologists in the area of occupational health routinely discuss with workers the importance of sleep. Thus, the promotion of healthy sleep duration in workers can be promoted by sleep health education and behavior changes. Liu et al. (2016)

recommend behavioral changes such as setting a pattern of going to bed at the same time each night and rising at the same time each morning. Moreover, Liu et al. also recommend that making sure that the bedroom environment is quiet, dark, relaxing, and neither too hot nor too cold. They suggest turning off or removing televisions, computers, mobile devices, and distracting or light-emitting electronic devices from bedroom, and to avoid large meals, nicotine, alcohol, and caffeine before bedtime. Finally and more important, organizations have to increase efforts to prevent WB in their workplaces. These efforts may help the recovery of workers exposed to WB and give them to opportunity to unwind and disconnect from work stressors.

Directions for Future Studies

In light of current research findings, it is necessary to continue the study of WB, sleep, and rumination relationship based on CATS as theoretical framework (Ursin & Eriksen, 2004). Moreover, it is important to incorporate biomarkers (e.g., cortisol, cytokines) mechanisms given its relation to the HPA axis and its relevance to examine CATS theoretical framework since this long-lasting activation deregulates the HPA axis and may lead to health and sleeping difficulties. The incorporation of biomarkers such as cytokines is important because sleep is regulated by a series of biochemical events in which many cytokines play a role in sleep regulation (Krueger & Churchill, 2003).

Conclusions

Our results suggest that the exposure to WB seem to have a negative effect on sleep well-being. Moreover, work-related rumination has a negative impact on sleep and also mediates negatively the relation between WB and sleep well-being; specially, affective rumination mediates negatively the relation of WB on sleep quantity and quality, while detachment mediates positively the relation between WB and sleep quality. Giving the results of the present study, occupational psychologists

should discuss with employees of the importance of sleep in the recovery process from job demands and its relevance to those employees exposed to WB. As a poor sleep well-being has been associated to numerous negative consequences such as increased mortality (e.g., Rod et al., 2011; Vgontzas et al., 2010), diabetes (e.g., Gangwisch et al., 2007; Yaggi, Araujo, & McKinlay, 2006), obesity (e.g., Panossian & Veasey, 2012; Beccuti & Pannain, 2011), burnout (e.g., Söderström, Jeding, Ekstedt, Perski, & Åkerstedt, 2014), and poor performance (e.g., Rosekind et al., 2014), it is essential that organizations pay more attention to it due to its importance and relevancy to employees' health and business costs. WB and sleep relation brings a challenge for psychologists in occupational health context and human resources practitioners in the management of this phenomenon in organizations.

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