Suicidal Tendency, Physical Health Problems and Addictive Behaviors among General Practitioners: the Effect of Burnout

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Abstract

The aim of this article is to analyze further the association of burnout with (poor) physical health, addictive behaviors and suicidal tendency among general practitioners (GPs). Four hypotheses were studied: burnout (i.e. emotional exhaustion, EE, and depersonalization, DP) is positively associated with suicidal tendency (i.e. ideation, plan and attempt) (H1), is negatively related to physical health (i.e. large number of physical symptoms and appearance of long-lasting impairment) (H2) and positively linked to addictive behaviors (i.e. addiction to alcohol and psychotropic medication) (H3) of GPs. Based on the “spiral of losses” depicted by the conservation of resources theory, we also considered that physical health mediates the relationships of burnout/suicidal tendency and burnout/addictive behaviors (H4).

1890 French GPs completed a questionnaire administered by phone. Collected information referred especially to burnout, three physical health indicators (BMI, number of physical symptoms and lasting physical health problems), four health behaviors (consumption of tobacco, alcohol, anxiolytics and antidepressants) and suicidal tendency (ideation, plan and attempt). Concerning EE, the results supported the hypotheses, except for alcohol consumption. The findings showed that DP favored positive outcomes when controlling for exhaustion. The discussion focuses mainly on the difference between EE and DP and on the limitations of the study.

Keywords: general practitioners, burnout, physical health, suicidal tendency, alcohol, psychotropic medication, conservation of resources theory
The aim of this article is to analyze further the association of burnout with (poor) physical health, addictive behaviors and suicidal tendency among general practitioners (GPs). The prevalence of these factors is generally higher for GPs than for the general population or comparable populations and they have frequently been studied. However, their relationships have rarely been analyzed in the same study and even more rarely studied among GPs. Thus, they need to be more fully examined, especially the role of burnout.

The prevalence of burnout among GPs has been extensively studied. The term ‘burnout’ was introduced in the 1970s by Freudenberger (1974) and Maslach (1976) to refer to an occupational stress outcome that occurs among professionals confronted with demanding and emotionally charged relationships with clients or patients. Burnout is generally defined as a psychological syndrome consisting of three dimensions: emotional exhaustion, depersonalization (or cynicism) and reduced personal accomplishment (Maslach & Jackson, 1981). Hence, burnout is now considered a serious and pervasive work problem not only for professionals, but also for their clients/patients as well as for organizations. For instance, burnout is known to reduce the quality of care (Shanafelt, Bradley, Wipf, & Back, 2002; Shirom, Nirel, & Vinokur, 2006; Williams, Manwell, Konrad, & Linzer, 2007). Several empirical studies suggest that GPs are a professional group particularly prone to burnout (e.g. Goehring, Bouvier Gallacchi, Künzi, & Bovier, 2005; Grassi & Magnani, 2000). Although the predictors of burnout among GPs have been well documented (see Lee, Seo, Hladkyj, Lovell, & Schwartzmann, 2013), the consequences of burnout on their health remain little studied and knowledge on this subject is still fragmentary.

**Understanding the links between burnout and GPs’ health: insights from the conservation of resources theory**

Drawing on the Conservation Of Resources theory (COR, Hobfoll, 1989, 2001) this study aimed at investigating three general hypotheses regarding the links between burnout and GPs’
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health: burnout (1) is positively associated with their suicidal tendency, (2) is negatively linked to their physical health and (3) is positively associated with their addictive behaviors.

The COR theory posits that individuals are motivated to obtain, retain and protect their “resources”. Resources have been defined as “objects, personal characteristics, conditions and energies that are valued by the individual or that serve as a means for attainment of these objects, personal characteristics, conditions, or energies” (Hobfoll, 1989, p. 516). Such resources are necessary for individuals to “create a world that will provide them pleasure and success” (p. 516). Consequently, stress arises when these resources are threatened, lost or unsuccessfully invested to gain another resource.

In line with the COR theory, burnout has been defined as “an affective state characterized by one’s feelings of being depleted of one’s physical, emotional and cognitive energies” and “follows prolonged exposure to stress” (Shirom & Melamed, 2005, p. 603). These emotional, physical and cognitive energetic resources are used by people to fulfill their professional duties and to cope with situations that potentially threaten what they value (Hobfoll & Shirom, 1993, cited by Shirom and Melamed, 2005). Accordingly, burnout results from chronic exposure to the threat of valued resources (objects, conditions or personal characteristics), which necessitates investing all available energetic resources during a (too) long period without succeeding in protecting or recovering the threatened resources. Because resource conservation or recovery requires investing other resources (Principle 2), if individuals do not have a strong resource pool, they are less likely to succeed in resource conservation or recovery (corollary 1). Thus, the individual could be engaged in a “spiral of losses” (corollary 2), given that losing one kind of resource increases the likelihood of the subsequent loss of other resources if work demands remain at a too high level. This “spiral of losses” hypothesis has received growing empirical support (Armon et al., 2008; De Cuyper et
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GPs’ suicidal tendency and addictive behaviors as “outcomes” of burnout

Relying on the spiral of losses hypothesis we can hypothesize that the depletion of energetic resources (e.g. emotional, physical) precedes and favors both suicidal tendency and addictive behaviors. The continuous threat to valued resources (e.g. material, personal characteristics or conditions) coupled with insufficient and decreasing energetic resources (necessary to implement active/problem-solving coping strategies) is likely to increase feelings of learned helplessness (McMullen & Krantz, 1988) as well as depressive symptoms (Hobfoll & Shirom, 2001), thus making suicidal ideation more prevalent and suicidal plan and attempt more likely. Moreover, the highly aversive nature of this situation, as well as the inability to implement active/problem-solving coping strategies, logically suggest that the depletion of energetic resources (e.g. emotional exhaustion) favors the consumption of alcohol and psychotropic medication, considered problem-avoidance and (bad) mood-regulatory coping behaviors (Carver, Scheier, & Weintraub, 1989). Furthermore, this phenomenon is probably strengthened by the fact that resource investment is intrinsically taxing (Shönpflug, 1985, cited by Hobfoll, 1989, 2001), making people with limited resources reluctant to invest them and more prone to “defensive” coping.

Available supporting empirical evidence

Both suicidal tendency (ideation, plan and attempt) and addictive behaviors were identified as especially prevalent among GPs or other medical specialties.

The risk of suicide among physicians is significantly higher than for the general population and other professionals (Center et al., 2003; Gold, Sen, & Schwenk, 2013; Hem et al., 2005; Rimpelä, Nurminen, Pulkkinen, Rimpelä, & Valkonen, 1987; Sansone & Sansone,
2009; Schernhammer & Colditz, 2004). Similarly, suicidal ideations have been identified as relatively frequent among GPs and medical students (Dyrbye et al., 2008; Gyorffy, Adám, Csoboth, & Kopp 2005; Hem, Grønvold, Aasland, & Ekeberg 2000) and as proximal predictors of suicidal planning and attempts (Dennis et al., 2009; Kessler, Borges, & Walters, 1999). Several empirical papers observed a relationship between burnout and suicidal ideation among GPs or other medical specialties (Cathébras, Begon, Laporte, Bois, & Truchot, 2004; Dyrbye et al., 2008; Olkinuora et al., 1990; Pompili et al., 2010; Shanafelt et al., 2011; Tomas-Sabado et al., 2010; van der Heijden, Dillingh, Bakker, & Prins, 2008).

Abuse of psychoactive substances among physicians has been extensively studied for many years (see O’Connor & Spickard, 1997; Baldisseri, 2007). Especially, the consumption of alcohol and psychotropic medication (e.g. anxiolytics, antidepressants) have been found to be more prevalent in this population (e.g. Cathébras et al., 2004; Domino et al., 2005; Hugues et al. 1992; Lutsky et al., 1994; Sebo, Bouvier Gallacchi, Goehring, Kunzi, & Bovier, 2007). Several studies observed that burnout was associated with alcohol consumption and the use of psychotropic medication in the physician population (which usually includes GPs: Cathébras et al., 2004; Harrison, & Chick, 1994; Juntunen et al., 1988; Soler, Yaman, & Esteva, 2007; Trichard, Danel, & Sobaszek, 2005). Similar observations were made in the general population or in other professions (Ahola et al., 2006, 2009; Chen & Cunradi, 2008; Cunradi, Greiner, Ragland, & Fisher, 2003; Leiter et al., 2013). However, some studies found no relationship between burnout and alcohol consumption (Blanchard et al., 2010; Kuerer et al., 2007).

Therefore, both theoretical reasoning and empirical evidence lead to the formulation of the following two hypotheses: **Hypothesis 1**: burnout of GPs is positively associated with their suicidal tendency (i.e. suicidal ideation, plan and attempt) (H1). **Hypothesis 2**: burnout of GPs is positively linked to their addictive behaviors. More exactly, it is assumed that
burned-out GPs consume more alcohol (H2a), anxiolytics (H2b) and antidepressants (H2c) than non-burned-out GPs.

**GPs’ burnout, decrement of physical health and outcomes**

At this point, one question has not been addressed by this theoretical reasoning: why and how are burnout and the physical health of GPs inter-related? According to Hobfoll’s approach (1989, 2001), physical functioning and abilities as well as the body’s responsiveness to environmental demands can be viewed as resources, and can be lost like emotional resources. Given that emotional exhaustion has been identified as the primary syndrome of the burnout process (Taris, Le Blanc, Schaufeli, & Schreurs, 2005), especially among healthcare providers (Maslach, 1976; Maslach & Jackson, 1981), and constitutes its “core” component (Lee et al., 2013), emotional resources (such as the capacity to express positive feelings towards the recipients and to respond empathically to their emotional needs) are likely to be depleted first, thus increasing the likelihood of the subsequent loss of physical resources, which is manifested through somatic symptoms and limitation of abilities. And so, this successive loss of resources (emotional exhaustion followed by physical impairment) probably favors addictive behaviors and suicidal tendency in GPs.

**Available supporting empirical evidence**

Few studies concern the prevalence of physical health problems among physicians (including GPs) in comparison to the general population and they report conflicting results (Stavem, Hofoss, Aasland, & Loge, 2001; Töyry et al., 2000; Tyssen, 2007).

In the general population as well as in other health care workers, the links between burnout and physical health have been fairly well documented (see Schaufeli & Enzmann, 1998; Shirom & Melamed, 2005). For instance, burnout was found to be associated mainly with cardiovascular disorders, sleep disturbances, dizziness, tachycardia, diarrhea, loss of
appetite, nausea, musculoskeletal disorders, diseases of the circulatory system or handicaps (Ahola et al., 2009; Armon, Shirom, Shapira, & Melamed, 2008; Belcastro 1982; Corrigan, Holmes, & Lutchins, 1995; Edéll-Gustafsson, Kritz, & Bogren, 2002; Gorter Eijkman, & Hoogstraten, 2000; Kim, Ji, & Kao, 2011; Korkeila et al., 2003; Kuerer et al., 2007; Landbergis, 1988; Lindblom, Linton, Fedeli, & Bryngelsson, 2006; Melamed, Shirom, Toker, Berliner, & Shapira, 2006; Saleh & Shapiro, 2008; Toppinen-Tanner, Ahola, Koskinen, & Väänänen, 2009). Three studies directly demonstrated a link between burnout and the physical health of GPs (Lee, Lovell and Brotheridge, 2010; Olkinuora et al., 1990; Vela-Bueno et al., 2008).

Complementarily, numerous studies have shown a link between physical health problems and suicidal tendency in the general population (e.g. Chan, Liu, Chau, & Chang, 2011; Dennis et al., 2009; Kishi, Kosier, & Robinson, 1996; Webb et al., 2012). To our knowledge, no study concerning the influence of physical health problems of GPs on their suicidal tendency has been conducted to date.

In line with this rationale and the empirical evidence reviewed above, two more hypotheses can be added: *Hypothesis 3*: burnout of GPs is negatively linked to their physical health. In particular, burnout is expected to be associated with a large number of physical problems/symptoms (H3a) (e.g. sleep disorders, gastric problems, dizziness, tachycardia, colitis etc.) and with the appearance of lasting physical health problems (limitation of abilities, handicap) (H3b). *Hypothesis 4*: physical impairment partially mediates the burnout-outcomes relationships. More precisely, the relationships between burnout and suicidal tendency (H4a), as well as with the consumption of alcohol (H4b), anxiolytics (H4c) and antidepressants (H4d), are both direct and indirect (*via* the decrement of physical functioning and abilities).

The Figure 1 below summarizes all the hypotheses under study.
Figure 1. Summary of hypotheses investigated

Method

Participants and procedure

1890 French GPs participated in the survey. 74.2% were men and ages ranged from 30 to 72 years ($M = 50.58, SD = 7.60$). On average, GPs worked 11.11 hours a day ($SD = 2.31$). They were part of a sample of GPs willing to participate in research on working conditions, randomly constituted from a nationally representative database of GPs in France by five URMLs (French regional associations of private practitioners) who collaborated in the study. Being a GP was the only inclusion criterion and the response rate was 94.5%. Each participant was paid the equivalent of two consultations for his/her participation. Each eligible GP first received a pre-notification letter describing the survey’s purpose and inviting them to participate. Telephone appointments were scheduled to administer the questionnaire. Interviewers received specific instructions on the optimal strategies to collect data in an efficient manner from GPs.
Material

Burnout

Emotional Exhaustion (EE) and Depersonalization (DP) were assessed with items derived from the French version of the Maslach Burnout Inventory-Human Services Survey (MBI-HSS, Maslach & Jackson, 1981), which is the most used measure of burnout. The French translation of the MBI-HSS is widely used in French-speaking countries. This tool has been validated in a sample of 383 Quebec health-workers by Dion and Tessier (1994) (i.e. factorial validity, internal consistency, long-range stability, convergent validity and hypothetico-deductive validity). The nine items of the EE scale refer to feelings of being exhausted by one's work (e.g. “I feel fatigued when I get up in the morning and have to face another day on the job”). The five items of the DP scale assess a detached and impersonal response toward the recipients (e.g. “I don't really care what happens to some recipients”). Ratings were given on a seven point Likert-type scale ranging from 0 (never) to 6 (daily). The internal consistency of each sub-scale was satisfactory (EE $\alpha = .81$; DP $\alpha = .64$). The Personal Accomplishment (PA) sub-scale was not used here, given that PA is considered a distinct construct (e.g. an individual characteristic) and not a symptom of job burnout (Cordes & Dougherty, 1993; Schaufeli & Taris, 2005).

Physical health indexes

The three indexes used to assess the physical health of GPs were the Body Mass Index (BMI), a somatic symptomatology index and a lasting physical health problem index. BMI corresponds to the weight in kilograms divided by the height in meters squared and rounded to 1 decimal place.

The repeated presence of several symptoms was also measured with eight questions referring to (1) sleep disorders, (2) eating problems (loss of appetite, anorexia or bulimia), (3)
gastric problems (heartburn, gastro-esophageal reflux), (4) heart palpitations, tachycardia, (5) feeling unwell, dizziness, vertigo or glare, (6) breathlessness, breathing difficulties, (7) colitis, chronic intestinal pains, constipation and (8) other physical symptom, with a binary response format. The repeated presence of the symptom was coded 1 and its absence was coded 0. The total score can vary between 0 and 8 and refers to the number of physical symptoms that repeatedly affect the GP (index of somatic symptomatology).

Lasting physical health problems index: first, one question measured the presence of a chronic physical health problem, with a binary response format (yes or no). If the answer was “yes”, two supplementary questions assessed the severity and frequency of the induced disabilities experienced during the last six months with the same response choice. The total score corresponds to the number of “yes” responses and can vary between 0 (no long-lasting health problem) and 3 (presence of a long-lasting physical health problem with severe and frequent disabilities).

Indexes of addictive behaviors

Alcohol consumption was assessed with three items derived from the Alcohol Use Disorders Identification Test (AUDIT-C, Bush, Kivlahan, McDonell, Fihn, & Bradley, 1998). The first question measured consumption frequency during the last year, from 0 (never) to 4 (4 or more times a week). The second question only concerned consumers and assessed the number of standard drinks containing alcohol on a typical day during the last year from 0 (1-2 drinks) to 4 (10 or more). The third question assessed the frequency during the last year of high consumption on one occasion (i.e. six drinks or more), from 0 (never) to 4 (daily or almost daily). The alcohol consumption score corresponds to the sum of the three ratings and can vary between 0 and 12.
Anxiolytic consumption was assessed with two questions. The first question concerned the use of anti-anxiety medication with a binary response format 0 (no) or 1 (yes). When the answer was “yes”, a second question measured the frequency of consumption, from 1 (rarely) to 4 (daily). The total score can vary between 0 and 4.

Antidepressant consumption was assessed with the same two questions as for anxiolytic consumption. The total score can also vary between 0 and 4.

Tobacco consumption was assessed with two questions. The first one referred to current tobacco smoking status and was coded by 0 (abstinent), 1 (occasional smoker) and 2 (daily smoker). Smokers were asked a second question concerning the number of tobacco products they smoked in a day and was coded by 1 (less than 10), 2 (between 11 and 20), 3 (between 21 and 30) or 4 (more than 30). The tobacco consumption score corresponds to the product of the two ratings (frequency*quantity). The total score can vary between 0 and 8.

Suicidal tendency index

Suicidal tendency was investigated with six questions. Presence/absence of suicidal ideation, suicide plan and suicide attempt were each measured with a binary response format 0 (no) and 1 (yes). Two periods were successively investigated: the whole life and the last twelve months. The total score corresponds to the sum of the six answers and can vary between 0 and 6.

Note that the internal consistency of these measures was not reported because they were “indexes”, which must be differentiated from “scales”. Indexes are used to assess formative constructs (i.e. that are formed through the accumulation of factors that theoretically contribute to the same encompassing variable but are not necessarily correlated, such as for quality of life, life stress, etc., see Edwards & Bagozzi, 2000). In contrast, scales include reflective indicators of the same latent construct, which are theoretically expected to
correlate strongly, making the use of internal consistency coefficients relevant (see Streiner, 2003).

**Data analyses**

Firstly, descriptive statistics and correlations between all variables were analyzed. Then, six hierarchical linear regression analyses were carried out. The four hypothesized dependent variables (suicidal tendency/consumption of alcohol/or anxiolytics/or antidepressants) were first regressed on gender, age, the average number of hours worked per day, BMI and tobacco consumption taken as control variables (Step 1). Then (Step 2), burnout indicators (EE, DP) were added as predictors in order to estimate their incremental predictive value ($\Delta R^2$).

Finally, the hypothesized mediators (lasting health problems and the number of physical symptoms) were included in Step 3. During two supplementary analyses, the two hypothesized mediators were also regressed first on control variables (Step 1), while EE and DP were subsequently included (Step 2). Given that the distributions were positively skewed with a high share of 0 score, we also performed several logistic regression analyses (72.6% of 0 score for suicidal tendency, 64.8% for lasting health problems, 94% for antidepressant consumption, 80.3% for anxiolytics consumption, 82.6% for tobacco consumption, 56.9% of 0 or 1 score for the number of physical symptoms and 57% of 0, 1 or 2 score for alcohol consumption). Although the transformation of ordinal variables into binary data has a number of disadvantages (e.g. loss of information, subjectivity in the determination of the cut-off value), logistic regression analysis could be viewed as more suited to the observed distributions. As the six hierarchical logistic regression analyses that were performed gave very similar results we did not report them here (they are available from the authors upon request).

Finally and complementarily, for each burnout indicator (EE and DP), mediation analyses were applied using the PROCESS macro for SPSS (Hayes, 2013) in order to test the
hypothesized mediations more thoroughly (with gender, age, the average number of hours worked per day, BMI, tobacco consumption and the other burnout indicators as control variables). Hayes’ approach is an integration and extension of known mediation/moderation analyses, which can estimate the statistical significance of indirect effects using a bootstrap procedure. Multiple samples were computed from the original sample by random replacements of values in order to test the robustness of regression coefficients by estimating a confidence interval (CI) for each indirect (i.e. mediated) effect (the 0 value must not be comprised in the CI). The original sample was resampled 2000 times and the bias-corrected percentile method was used to create 95% CI.

To note that age and gender were included in all analyses because they were regularly identified in past research as predictors of burnout, physical health, addictive behaviors and suicidal tendency (Ahola et al., 2009; Harrison, & Chick, 1994; Peisah, Latif, Wilhelm, & Williams, 2009; Purvanova & Muros, 2010; Schernhammer & Colditz, 2004).

Results

Descriptive statistics and correlations between variables

Table 1 shows the descriptive statistics and intercorrelations of the variables included in this study. Overall, GPs were quite exhausted (M = 27.45, SD = 10.08) and slightly depersonalized their recipients (M = 11.15, SD = 11.40). These scores were somewhat higher than those observed in other French samples (Cathébras et al., 2004; Truchot, 2003, 2009). The number of physical symptoms (.44), anxiolytic consumption (.22), suicidal tendency (.17), antidepressant consumption (.13), lasting physical health problems (.13) and BMI (.08) were significantly correlated with EE. On the other hand, EE was not associated with alcohol or tobacco consumption. Correlations with DP were lower.
Table 1. Descriptive statistics (Mean and Standard Deviation) and zero-order correlation matrix of variables under study.

<table>
<thead>
<tr>
<th>Variables</th>
<th>$M$</th>
<th>$SD$</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-Age</td>
<td>50.58</td>
<td>7.06</td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>2-Gender (coded 1 = men, -1 = women)</td>
<td>74.2% men</td>
<td>.27*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>3- Emotional exhaustion</td>
<td>27.45</td>
<td>10.08</td>
<td>-.06</td>
<td>-.02</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>4- Depersonalization</td>
<td>11.15</td>
<td>11.40</td>
<td>.00</td>
<td>.11*</td>
<td>.37*</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>5- Body Mass Index</td>
<td>24.25</td>
<td>3.09</td>
<td>.18*</td>
<td>.28**</td>
<td>.08*</td>
<td>.09*</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>6- Lasting health problems</td>
<td>0.51</td>
<td>0.78</td>
<td>.22*</td>
<td>.04</td>
<td>.13*</td>
<td>.04</td>
<td>.13*</td>
<td></td>
<td></td>
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<tr>
<td>7- No. of physical symptoms</td>
<td>1.58</td>
<td>1.55</td>
<td>-.01</td>
<td>.11*</td>
<td>.44*</td>
<td>.09*</td>
<td>.10*</td>
<td>.29*</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>8- Alcohol consumption</td>
<td>2.45</td>
<td>1.82</td>
<td>.23*</td>
<td>.26*</td>
<td>.02</td>
<td>.05</td>
<td>.12*</td>
<td>.09*</td>
<td>.01</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>9- Tobacco consumption</td>
<td>0.33</td>
<td>1.16</td>
<td>.03</td>
<td>.03</td>
<td>-.01</td>
<td>-.03</td>
<td>.01</td>
<td>.06*</td>
<td>.10*</td>
<td></td>
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<tr>
<td>10- Anxiolytic consumption</td>
<td>0.42</td>
<td>0.94</td>
<td>.03</td>
<td>-.05</td>
<td>.22*</td>
<td>.01</td>
<td>-.02</td>
<td>.14*</td>
<td>.25*</td>
<td>.00</td>
<td>.03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11- Antidepressant consumption</td>
<td>0.18</td>
<td>0.84</td>
<td>-.01</td>
<td>.07*</td>
<td>.13*</td>
<td>.00</td>
<td>.03</td>
<td>.16*</td>
<td>.19*</td>
<td>.02</td>
<td>.07*</td>
<td>.29*</td>
<td></td>
</tr>
<tr>
<td>12- Suicidal tendency</td>
<td>0.36</td>
<td>0.69</td>
<td>.01</td>
<td>-.02</td>
<td>.17*</td>
<td>.03</td>
<td>-.01</td>
<td>.14*</td>
<td>.26*</td>
<td>.05</td>
<td>.08*</td>
<td>.19*</td>
<td>.26*</td>
</tr>
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</table>

* $p < .01$
DP was significantly associated with BMI (.09) and the number of physical symptoms (.09). Lasting health problems, number of physical symptoms, suicidal tendency, consumption of anxiolytics and antidepressants were also moderately interrelated, whereas correlations of BMI, alcohol consumption and tobacco consumption with other health indexes were quite weak.

Age was positively correlated with BMI (.18), lasting health problems (.22) and alcohol consumption (.23). Being a men (coded 1) was associated with a higher level of depersonalization (.11), a higher BMI (.28) and a higher consumption of alcohol (.26), whereas being a women (coded -1) was associated with more physical symptoms (-.11) and more antidepressants intake (-.07).

Complementary analyses: hierarchical linear regression and mediation analyses

Table 2 presents the results of the six multiple hierarchical linear regression analyses. Except for alcohol consumption, including EE and DP always increased the explained variance (Step 2, $\Delta R^2$ from .02 to .07, $p < .01$). EE was significantly and positively associated with anxiolytic ($\beta = .30, p < .01$) and antidepressant ($\beta = .17, p < .01$) consumption, as well as with suicidal tendency ($\beta = .23, p < .01$), the number of physical symptoms ($\beta = .49, p < .01$) and lasting health problems ($\beta = .15, p < .01$). However, the association with alcohol consumption was non-significant ($\beta = -.01$). After the inclusion of the two hypothesized mediators at Step 3 (i.e. lasting health problems and the number of physical symptoms), EE remained significantly linked to anxiolytic consumption ($\beta = .21, p < .01, \Delta \beta = .09$), antidepressant consumption ($\beta = .09, p < .01, \Delta \beta = .08$) and suicidal tendency ($\beta = .13, p < .01, \Delta \beta = .10$), although each beta coefficient decreased (cf. $\Delta \beta$).
Table 2. Results of the six hierarchical linear regression analyses (Beta coefficients and 95% Confidence Intervals in brackets).

<table>
<thead>
<tr>
<th></th>
<th>Alcohol consumption</th>
<th>Anxiolytic consumption</th>
<th>Antidepressant consumption</th>
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<td>Step 2</td>
<td>Step 3</td>
</tr>
<tr>
<td>Age</td>
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<td>.18** (.12/.24)</td>
<td>.16** (.10/.22)</td>
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<tr>
<td>Gender</td>
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<td>.19** (.13/.25)</td>
<td>.19** (.14/.25)</td>
</tr>
<tr>
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<td>-.06 (-.11/.01)</td>
<td>-.05 (-.01/.10)</td>
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<tr>
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<td>.05 (-.01/.10)</td>
<td>.03 (-.02/.09)</td>
</tr>
<tr>
<td>Tobacco consumpt</td>
<td>.10* (.05/.16)</td>
<td>.10** (.05/.16)</td>
<td>.10** (.05/.16)</td>
</tr>
<tr>
<td>Emotional exhaust</td>
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<td>-.04 (-.11/.02)</td>
<td>-.04 (-.24/.36)</td>
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<tr>
<td>Depersonalization</td>
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<td>.04 (-.02/.10)</td>
<td>-.12** (-.18/.07)</td>
</tr>
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<td>Lasting health prob.</td>
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<td>.05 (.01/.10)</td>
<td>.05 (.01/.10)</td>
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<td>No. phys. symptoms</td>
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<td>.18** (.12/24)</td>
<td>.18** (.12/24)</td>
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<td>$R^2$</td>
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<td>.11</td>
<td>.12</td>
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<tr>
<td>Δ$R^2$</td>
<td>.11**</td>
<td>.00</td>
<td>.01*</td>
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* $p < .05$; ** $p < .01$; ¹: Men = 1, Women = -1
Table 2 (continued). Results of the six hierarchical linear regression analyses (Beta coefficients and 95% Confidence Intervals in brackets).

<table>
<thead>
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<th>Step 1</th>
<th>Step 2</th>
<th>Step 3</th>
<th>Step 1</th>
<th>Step 2</th>
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<td>-.02</td>
<td>-.01</td>
<td>.05</td>
<td>-.04</td>
<td>-.02</td>
<td>-.05</td>
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<td>-.03</td>
<td>-.06*</td>
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<td>.11**</td>
<td>.13**</td>
<td>.12**</td>
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<td>.04</td>
<td>.03</td>
<td>.08**</td>
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<td>-.00</td>
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<tr>
<td>No. of physical symptoms</td>
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<td>.18**</td>
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<tr>
<td><strong>R²</strong></td>
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<td>.05</td>
<td>.09</td>
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<td><strong>ΔR²</strong></td>
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<td>.04**</td>
<td>.03**</td>
<td>.20**</td>
<td>.07**</td>
<td>.02**</td>
</tr>
</tbody>
</table>

* p < .05; ** p < .01; *: Men = 1, Women = -1
The results obtained concerning DP were different. Overall, the standardized beta weights were lower (mean $|\beta| = .07$ at Step 2) than for EE (mean $|\beta| = .23$ at Step 2). Moreover, while the zero-order correlations with the dependent and mediating variables were non-significant (except with the number of physical symptoms, $r = .09, p < .01$, see Table 1), DP was negatively associated with four of these variables at Step 2 (partial correlations): anxiolytic consumption ($\beta = -.12, p < .01$), antidepressant consumption ($\beta = -.07, p < .05$), suicidal tendency ($\beta = -.06, p < .05$) and the number of physical symptoms ($\beta = -.12, p < .01$). Furthermore, DP was no longer significantly linked to antidepressant consumption and suicidal tendency once the hypothesized mediators were included at Step 3 ($\beta = -.05$ and $\beta = -.04$, respectively). Like for EE, DP was not significantly linked to alcohol consumption ($\beta = .03$).

Lasting health problems and the number of physical symptoms were both significantly and positively associated with antidepressant consumption ($\beta = .11$ and $\beta = .13$, respectively, $p < .01$) and with suicidal tendency ($\beta = .10$ and $\beta = .18$, respectively, $p < .01$). Alcohol consumption was only linked to lasting health problems ($\beta = .07, p < .05$) and anxiolytic consumption was only associated with the number of physical symptoms ($\beta = .18, p < .01$). Their inclusion at Step 3 systematically increased the explained variance ($\Delta R^2$ from .01, $p < .05$ to .04, $p < .01$).

Hayes’ (2013) mediation analyses corroborated the idea that EE had an indirect effect via the number of physical symptoms on suicidal tendency (.05; CI: .03/.08; Sobel’s $z = 5.32, p < .001$), anxiolytic consumption (.07; CI: .05/.11; $z = 5.46, p < .001$) and antidepressant consumption (.05; CI: .02/.08; $z = 3.97, p < .001$), but not on alcohol consumption (.03; CI: -.03/.08; $z = 1.13, p = .26$). Lasting health problems also partially mediated the effect of EE on suicidal tendency (.01; CI: .00/.02; $z = 2.82, p < .01$), antidepressant consumption (.01; CI: .00/.02; $z = 2.93, p < .001$) and alcohol consumption (.02; CI: .00/.04; $z = 2.08, p < .04$), but
not on anxiolytic consumption (.01; CI: -.00/.02; z = 1.47, p = .14). Direct effects of EE on suicidal tendency (.08; CI: .04/.12; p < .001), anxiolytic consumption (.18; CI: .13/.24; p < .001) and antidepressant consumption (.06; CI: .02/.11; p < .01) were significant, whereas alcohol consumption was not directly affected by EE (-.07; CI: -.18/.04, p = .21).

Concerning DP, the number of physical symptoms significantly mediated its preventive effect on suicidal tendency (-.01; CI: -.03/.01; z = -3.38, p < .001), anxiolytic consumption (-.02; CI: -.04/.01; z = -3.40, p < .001) and antidepressant consumption (-.01; CI: -.02/.00; z = -2.93, p < .001), but not on alcohol consumption (-.01; CI: -.03/.01; z = 1.07, p = .29). Lasting health problems significantly mediated none of the indirect effects of DP. The sole significant direct effect of DP was observed on anxiolytic consumption (-.10; CI: -.15/.04; p < .001).

Discussion

Main findings

The results concerning the links between burnout dimensions and suicidal tendency (H1) showed that EE was associated with suicidal tendency among our sample of GPs, thus confirming past studies (e.g. Tomas-Sabado et al., 2010, Cathébras et al., 2004). As EE can be considered the core dimension of burnout (Lee et al., 2013), its correlation with suicidal tendency somewhat supports our first hypothesis. Moreover, its correlation remained significant in multiple regression analysis. However, the non-significance of the zero-order correlation of DP suggests that it is only the exhaustion component of burnout that favors suicidal tendency, not its psychological withdrawal component, which seemed to have reverse indirect effects (see below). Hence, our first hypothesis was partially corroborated.

The links between burnout and alcohol were weak. The finding that GPs suffering from burnout have a higher alcohol consumption (e.g. Juntunen et al., 1988; Cathébras et al.,
2004) was not confirmed here. However, the fact that anxiolytic and antidepressant consumptions were related to EE was consistent with previous research (Soler et al., 2007; Tricard et al., 2005; Blanchard et al., 2010). Although there is some support for our second hypothesis, regarding anxiolytic (H2b) and antidepressant (H2c) consumptions, the links between burnout and alcohol consumption (H2a) were not conclusive. It is possible that a third variable moderates the burnout/alcohol consumption relationship. Alcohol consumption may be viewed as a strategy adopted by workers in order to cope with demanding situations (Carver et al., 1989). It is a protective strategy that facilitates mental disengagement and, by doing so, temporarily reduces exposure to stressors, while impeding adoption of a more functional problem-solving strategy. Opting for one coping strategy or another largely depends on the primary appraisal of environmental demands and the secondary appraisal of available resources and possibilities of action (Lazarus & Folkman, 1987). A deeper analysis of appraisals made by GPs facing excessive demands would probably help to identify the existence of a moderating variable at that level.

The results concerning the links between burnout dimensions and physical health indicators (H3) underlined the preponderant role of EE. The highest observed correlation (.44) involved EE and the number of physical symptoms, thus confirming previous studies that highlighted the physical consequences of burnout among GPs (Olkinuora et al., 1990; Vela-Bueno et al., 2008; Lee et al., 2010) and supporting our hypothesis H2a. The association between burnout and lasting health problems (H2b) is partially supported because the magnitude of the correlation was lower for EE and did not reach statistical significance for DP. Overall, our results also pointed out that associations between DP and physical health indicators or behaviors were lower.

Hierarchical multiple linear regression analyses and mediation analyses corroborated the idea that EE has direct effects on suicidal tendency and on the consumption of
psychotropic drugs, as well as indirect/mediated effects via the number of physical symptoms and lasting health problems. The number of physical symptoms appeared to be the main mediator, as illustrated by regression coefficients in mediation analyses. Indirect effects on suicidal tendency and on the consumption of psychotropic medication were also observed for DP. However, contrary to our fourth hypothesis, lasting health problems did not mediate these effects. Furthermore, these effects were negative, suggesting that DP somewhat preserves GPs’ health. Although they were unexpected, these results can be explained. In fact, they are consistent with the conceptualization of DP as a coping strategy adopted by workers in order to reduce relational strain (see Taris et al., 2005) and, accordingly, they suggest that DP may be a rather protective strategy, at least in the short term.

On the whole these results corroborated most of the hypotheses under study. Generally speaking, they thus corroborated the COR theory. More precisely, the fact that EE was positively associated with a poor physical health, suicidal tendency and addiction to psychotropic medication is consistent with the Principle II / corollary 1 of COR theory. These results illustrate that burned-out GPs were less capable of conserving their remaining resources (e.g. physical functioning and abilities, optimism) than their colleagues because of a stronger depletion of their emotional energetic resources. Furthermore, the fact that the decrement of physical health was identified as mediating the association of EE with suicidal tendency and substance abuse is consistent with the “spiral of losses” hypothesis (Principle II / corollary 2) of the COR theory.

**Gender and age differences**

The higher consumption of alcohol by men compared to women in our sample was similar to previous findings in the general population (e.g. Wilsnack, Vogeltanz, Wilsnack, & Harris, 2000). The results of a higher consumption of anxiolytics and antidepressants by women were also in agreement with various studies carried out in the general population (e.g. Van
The fact that suicidal tendency did not differ significantly according to gender among GPs was not consistent with the literature (e.g. Hem et al., 2000; Schernhammer & Colditz, 2004). However, as noted by Schernhammer and Colditz (2004), most physicians are men. Thus, the lower number of women included in our representative sample and the fact that suicide and suicidal ideation are, fortunately, low-occurrence phenomena strongly limited statistical inferences.

Gender differences regarding the number of physical symptoms might be interpreted as reflecting the tendency of women to somatize more than men (Wool & Barsky, 1994), although the observed relationship in our study was weak and the gender / somatization association in the literature depend on the presence of moderators or confounders (Creed & Barsky, 2004).

The fact that male physicians tended to score higher on DP was consistent with Schaufeli and Enzmann (1998) or Prins and collaborators (2007). However, these studies also reported significant differences concerning EE, with higher scores for women. In our sample, gender and EE score was not significantly linked. As noted by Pretty, McCarthy, and Catano (1992), the results in the literature concerning the effects of gender on burnout dimensions are mixed. In their study, they observed that job level moderates the relationship between these two variables: men were more emotionally exhausted in managerial positions and women were more exhausted in non-managerial positions. Given that such a distinction between managerial and non-managerial positions does not really concern GPs, the absence of difference between females and males in our sample appears to be quite logical. Furthermore, the gender effect is lower in European countries (see meta-analysis of Purvanova & Muros, 2010).
Concerning age, there was no difference between younger and older GPs with respect to EE and DP. The links between burnout and age among physicians are inconsistent. Some studies reported an absence of correlation (e.g. Kirwan & Armstrong, 1995) whereas other empirical studies showed that doctors with years of experience had significantly lower scores on MBI subscales of DP and EE (e.g. Peisah, Latif, Wilhelm, & Williams, 2009). These conflicting findings regarding the burnout and age relationship could be explained by confounders like experience, position or status (Maslach, Schaufeli, & Leiter, 2001), thus age has no specific effect per se.

**Limitations of the study and avenues for future research**

Because this study is correlational, inferences about causal relationships between variables remain limited. More precisely, as illustrated by Taris and Kompier (2006), the results of cross-sectional mediation analyses should be approached with caution. They found that longitudinal models are better suited for examining mediation than cross-sectional models. In the latter, the temporal indeterminacy makes it impossible to estimate reliably the causal order of variables under study because of the one-phase data collection. In the present study, the application of Hayes’ procedure (2013) corroborated the idea that the number of physical symptoms that repeatedly affected GP health (e.g. sleep disorders, gastric problems, tachycardia etc.) mediated the association of burnout (more precisely EE) with their suicidal tendency, antidepressant consumption and anxiolytic consumption. However, it could be argued that it was chronic physical impairment that favored EE and, finally, suicidal tendency and addiction to psychotropic medication. Accordingly, additional analyses of EE mediating effects of the number of physical symptoms on suicidal tendency, anxiolytic consumption and antidepressant consumption gave similar results (not shown here). The cross-sectional design used here does not enable this question to be investigated further. As recommended by Taris and Kompier (2006), a multiphase longitudinal study, with at least three waves of data
collection, is required to confirm our results.

Another limitation has to be mentioned: the use of several indexes, developed specifically for the study, somewhat reduced the comparability of our research with previous studies. Thus, in addition to using a longitudinal design, future studies will need to replicate these results using measures that have already been used in previous research.

Finally, although the reported results are statistically significant, they were of relatively weak magnitude \((R^2 \text{ between .07 and .23 for the full models})\). This indicate that other predictors have to be included in future research, such as a family history of substance abuse or mental illness, or certain personality traits (e.g. mood / anxiety disorders) (Baldisseri, 2007; Kessler et al., 1999). Taking into account the differences between GPs who are isolated and lack support (e.g. in rural areas) as opposed to GPs working in group practices who have more support from colleagues (e.g. in urban areas) would be also of a great relevance and could strengthens the explanatory power of our model, given that social support of colleagues have been identified as a protecting resource (e.g. Prins et al., 2007) Thus, the consideration of these would allowed us to test the hypotheses concerning the influence of burnout in a more robust manner.

**Practical implications**

Burnout is known to decrease the quality of care (e.g. Shanafelt, et al., 2002; Williams et al. 2007) and, as illustrated by our results, could have long-term deleterious effects on their health, which in turn decrease the overall efficacy of the healthcare system given their central role in the early prevention, diagnosis and treatment of diseases (Baldisseri, 2007). Thus, apart from the fact that helping them to preserve their health is intrinsically a desirable purpose, preventing burnout of GPs is a twofold stake, both for the patients and the entire society. Because occupational antecedents of EE are generally difficult to modify, recent
research has focused on the development of resilience strategies. For example, these strategies can consist of leisure-time activities, self-demarcation, limitation of working hours, continuous professional development, acceptance of professional and personal boundaries, personal reflexivity and focusing on the positive aspects of work (Zwack & Schweitzer, 2013). Attempts to develop such resilience strategies among health-care workers include mindfulness-based stress reduction programs (Shapiro, Astin, Bishop, & Cordova, 2005) and cognitive behavioral approaches (Gardiner, Lovell, & Williamson, 2004). In the light of our results, information on the burnout process and its consequences coupled with stress-reduction programs could help GPs to recognize the spiral of losses and develop resilience strategies.

**References**


HEALTH CONSEQUENCES OF BURNOUT


Health Consequences of Burnout


