

Qualitative evaluation of content similarity in the context of clinical research: The case of the original reference definitions of 'burnout'

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Abstract

'Burnout' is one of those medical terms that lack a consensual definition, although its definitions may appear very similar. This paper outlines and discusses research carried out to find the shared elements of the original reference definitions of 'burnout' used in scientific literature between the 1990s and today, as a preliminary step towards the setting up of a harmonised definition. In order to pinpoint what is common in the original reference definitions of 'burnout', we developed and implemented a methodology based on the application of a linguistic – in particular, semantic – analysis. Our methodology may be of interest to researchers in other fields as a way to carry out a preliminary investigation of the definitions in use for a (specialist) term.

KEYWORDS: BURNOUT; DEFINITIONS; CLINICAL RESEARCH; CONTENT SIMILARITY
EVALUATION; SEMANTICS

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1 Introduction

Researchers and practitioners face wide-ranging problems when the terms they use lack a consensual definition. In the fields related to medicine and public health this is the case, for example, concerning the term 'burnout'. The use of different definitions and the absence of a broad agreement on any of them have serious medical, social, economic and scientific repercussions, such as hindering the implementation of appropriate preventive measures, hampering the development of suitable treatments and slowing down the progress of research on burnout and burnout-related issues. Moreover, although this is beyond the focus of the present paper, it is worthwhile to note that the construction of burnout as a problem (in the sense of Spector and Kitsuse 2001 [1987] and of Best 2020) is central to our contemporary society.

In their extensive specialised literature review, Heinemann and Heinemann (2017: 1) emblematically claim that burnout research has reproduced 'the *vagueness and ambiguity* of the concept that it aims to clarify' (our emphasis). In view of this situation, the European Commission-funded OMEGA-NET consortium decided to work towards a harmonised definition of 'occupational burnout' to be used in professional practice (Guseva Canu *et al.* 2021).¹ This work included a semantic analysis of the reference definitions, in order to extract the common elements. In view of the linguistic nature of the main issues involved – the lack of a consensual definition and therefore the use of (more or less) slightly different definitions in professional practice, the recognised presence of vagueness and ambiguity in research, the need to find what is common in the definitions – an interdisciplinary and interprofessional approach seems not only appropriate, but also required. In this paper we illustrate the collaborative research we carried out in order to set up a template for a definition of 'burnout' based on the shared elements of the definitions in use. Our focus is on the contribution of applying linguistic methods and, in particular, the linguistic methodology implemented by our restricted team of a linguist, a psychologist and an epidemiologist. A synthetic description of the other stages of the project – including the implementation of the Delphi consensus methodology – can be found in a previous work (Guseva Canu *et al.* 2021).

Essential background information on the issue of recognising similarity in burnout definitions is given empirically in the next section. Section 3 outlines the systematic review and the setting up of the corpus. Section 4 describes how the data were analysed. Section 5 outlines and discusses the methodology which was implemented to pinpoint the shared features emerging from the original reference definitions of burnout. This includes a semantic analysis (Phase 1), the setting up of a definition template based on three levels of burnout outbreak (Phase 2) and finally the formulation of a (provisional) definition based on the

shared elements (Phase 3). Section 6 sums up the main results and comments on further developments.

2 The problem of assessing similarity

The ‘physical AND emotional exhaustion state’ (SNOMED-CT 2020, emphasis in the original) commonly referred to as ‘burnout’ is not recognised as an *illness* by the World Health Organization (WHO) nor by the American Psychiatric Association (APA).² In SNOMED-CT (2020), which is considered to be the standard reference resource for medical terminology, burnout is recognised as a *disorder*. However, as noticed in Guseva Canu *et al.* (2021: 96–97), this definition is not well known or used among professionals. Health professionals seem to prefer the definition in the *International Statistical Classification of Diseases and Related Health Problems* (ICD-11):³

Burnout is a syndrome conceptualized as resulting from chronic workplace stress that has not been successfully managed. It is characterised by three dimensions: 1) feelings of energy depletion or exhaustion; 2) increased mental distance from one’s job, or feelings of negativism or cynicism related to one’s job; and 3) reduced professional efficacy. Burn-out refers specifically to phenomena in the occupational context and should not be applied to describe experiences in other areas of life (World Health Organization 2022)

To get a quick idea of the type of problems involved in carrying out a linguistic analysis of the original reference definitions, it is useful to compare the SNOMED-CT and the ICD-11 definitions with the non-specialised definition of the *Oxford English Dictionary* (*OED*: s.v. *burn-out*), which should reflect – at least to a certain extent – how the term is used today in non-specialist language: ‘physical or emotional exhaustion, esp. caused by stress at work; depression, disillusionment’.

The *OED* and the ICD-11 explicitly characterise ‘burnout’ as related to work, although the latter leaves it unclear whether this is the only context or not. The term ‘exhaustion’ is recognised as vague and needing adjectives by SNOMED-CT and the *OED*, both adding ‘physical’ and ‘emotional’, and the physical aspect is implicit in the ICD-11’s ‘energy depletion’, presented as the meaning of – or as synonymous with – the concept of ‘exhaustion’. It is certainly reasonable to query here what this may share with the *OED*’s synonym ‘depression’. Have the ‘negativism’ and ‘cynicism’ of the ICD-11 something in common with ‘disillusionment’ of the *OED*? What is the difference between speaking of ‘feelings of exhaustion’ and ‘exhaustion’ (ICD-11)?, and so on. The point to be made here is that not only are the definitions differently structured – SNOMED-CT is extremely synthetic, the ICD-11 is explicative and normative on how the term should be used, and the *OED* conflates at least two different senses and reflects some of the everyday uses of the term – but

all are ambiguous or more often vague, in the sense that they often remain underspecified (see Section 5.1). The authors of the definitions do not give enough information for disambiguation.

In terminological work, ambiguous occurrences of a term are generally avoided and polysemy is dealt with by observing 'several occurrences of a lexical item and mak[ing] decisions based on large samples' (L'Homme 2020: 102; see also Temmerman 2000: 125–154). It is important to underline that, because of the design of our research based on reference definitions, we could only partially implement a usage-based approach. Our goal was not to find how the term is used, but what reference definitions have in common. We consider that this is the first step towards a potentially shared definition of 'burnout'.

3 A systematic review of literature and the setting up of the corpus

In order to find the reference definitions of 'burnout' used in the specialist literature, a systematic review and the setting up of a corpus containing the relevant publications were carried out. Then, the original reference definitions of burnout were manually extracted based on a study of the corpus (cf. Guseva Canu *et al.* 2021: 96, 99). It is crucial to underline that only professional burnout was taken into consideration: other possible types of burnout, such as 'parental burnout' or 'student burnout' were excluded from the review. These are debated concepts and are sometimes explicitly ruled out from the definition of burnout (see, for example, the ICD-11 definition above), whereas the term is used in relation to workers from its first appearance in the scientific literature (Bradley 1969).

The corpus was built by collecting papers written in English which focused on workers and which appeared in peer-reviewed publications between 1990 and 2018. A total of 248 publications were selected as eligible out of the 5297 articles dealing with 'burnout' that were found in the databases Embase, PsycINFO and MEDLINE for the retained timespan. The selection was based on the following four criteria: (1) the studies must deal with the onset of burnout in relation to factors of any kind (occupational, organisational, individual); (2) they had to implement a longitudinal design; (3) they had to make an assessment of exposure before the onset of burnout; and (4) the number of participants in the exposed group must be at least 50. Eligibility was checked by at least two independent reviewers for 443 potentially eligible papers. After screening, 248 articles were retained to constitute the corpus.

Subsequently, 88 secondary definitions of the term 'burnout' were manually extracted on the basis of key terms, expressions and devices referring to reference definitions (e.g., quotations). These 88 secondary definitions were

manually indexed to 11 original reference definitions. Originality refers to the first formulation of a definition in chronological terms. This criterion allowed the team to exclude later reformulations of the same definition by the same author(s). The criterion of being used as a reference definition allowed the team to select definitions on the basis of their acknowledgement and impact in research. It is important to highlight that the retained definitions could also come from publications not included in the initial corpus, as is the case for definitions that appeared before 1990. Finally, it must also be highlighted that the 11 original reference definitions are not necessarily well-formed definitions from a traditional terminological perspective (cf. L'Homme 2021: 83–84): they are called here ‘definitions’ simply because they are used as such in the relevant literature.

The group of the 11 original definitions will be called the ‘sub-corpus’ from now on. The references that make up the group are shown chronologically in Table 1 (D1–D11), along with one further definition (D12), which appeared later than 2018 and is used as a benchmark for the results of the semantic analysis.

Table 1. The sub-corpus (D1–D11), and the benchmark reference (D12)

D1	Freudenberger (1974: 160)
D2	Maslach (1976: 16, 19)
D3	Pines and Maslach (1980: 6)
D4	Cherniss (1980)
D5	Maslach and Jackson (1981: 99)
D6	Pines and Aronson (1981)
D7	Shirom (1989: 32, 33–34)
D8	Schaufeli and Enzmann (1998: 19, 20–25, 36)
D9	Gundersen (2001: 145)
D10	Demerouti <i>et al.</i> (2001: 508)
D11	Kristensen <i>et al.</i> (2005: 196–197).
D12	Schaufeli <i>et al.</i> (2019: 31)

These were judged by the psychologist and the epidemiologist members of the team as up-to-date complete definitions, as they are built on the previous ones and incorporate the most recent progress in thinking about burnout (for the sub-corpus with the benchmark definition see the Appendix). After the sub-corpus was set up, the linguist joined the restricted OMEGA-NET team, carried out the linguistic analysis (Section 4) and devised the methodology (Section 5) to find what is shared among the original reference definitions of ‘burnout’.

4 Preliminary linguistic analysis of the original reference definitions

The definitions of the Table 1 sub-corpus are presented chronologically in the Appendix and are striking for their variety. They are for the most part direct quotations from the publications, but in a few cases (D4, D6) they correspond to a synthesis made by the psychologist team member by collecting elements present in different passages.⁴ Definition 1, dating from 1974, is from Herbert Freudenberger, who is often considered the founding father of the concept of burnout (Heinemann and Heinemann 2017: 2), though the term had been introduced into medical jargon earlier by Bradley (1969) (also see Dell'Oro [in preparation] for a note on the origins of the term 'burnout' in a diachronic perspective).

As a preliminary step, the degree of dis-/similarity between the definitions in the sub-corpus was assessed with regard to (1) the subjacent structure of each definition in terms of outbreak levels (physical, psychological, cognitive, mental, affective, emotional, motivational, behavioural), as well as (2) the content, where special attention was paid to the mention of symptoms. Causes and effects of burnout were not systematically taken into account, as in order to pinpoint them one needs first to set up a valid definition of 'burnout'. Therefore, we focused on symptoms as the elements at the core of any diagnostic tool able to identify the burnout condition.

As regards structure, the authors use different strategies: the burnout phenomenon can be described in the form of a list of single terms (e.g. D4: 'stress, strain, boredom, self-doubt, dissatisfaction, insecurity, disappointment, and frustration'), as a list of nominalisations (e.g. D1: 'feeling of exhaustion and fatigue, being unable to shake a lingering cold, suffering from frequent headaches and gastrointestinal disturbances [...]') and also in a more discursive way (e.g. D2: 'They lose all concern, all emotional feeling, for the persons they work with and come to treat them in detached or even dehumanized ways').

In terms of content, some definitions refer to symptoms (e.g., 'exhaustion', which is explicitly mentioned in almost all definitions), while others mention causes (e.g. D2: an inability 'to cope with [...] continual emotional stress') and/or effects (e.g. D3: a 'loss of concern for other people'). The degree of precision in the description of symptoms, causes and/or effects varies. For example, in D1, Freudenberger (1974) pairs a very generic 'feeling of exhaustion and fatigue' with the very specific incapacity of shaking a lingering cold, a symptom which is not mentioned in any of the later definitions. Moreover, some authors make explicit reference to only two levels (e.g., the physical and the behavioural levels in D1), some make reference to up to five levels (in D8 we find an affective, a cognitive, a physical, a behavioural and a motivational level), while others

make no specification at all about the level to which they refer. For example, in D9 it is not at all clear whether exhaustion is to be intended as a physical or as a psychological/emotional condition, or as both.

As could be expected from the nature of the corpus, the term ‘work’ also frequently appears in the definitions, sometimes as a verb (D2, D3, D6), sometimes as a noun (D5, D6, D7, D8, D9, D11). In D1 work is not explicitly mentioned, but the term ‘staff’ (‘staff member’) is found (the adjective ‘working’ in the phrase ‘working definition’ in D8 is excluded here for semantic reasons).

Only one word is used in almost all the definitions, namely ‘exhaustion’ (whatever the outbreak level): this term is present in 10 definitions out of the 11 (see also ‘uitputting’ [‘exhaustion, depletion’] in D12). The diversity of terms is due to the historic fact that many studies were carried out by specialists from different domains: physicians, psychologists and sociologists. It is important to be aware that the definitions were analysed extrapolated from their context. However, the team discussed the terms used in the light of each publication in its entirety.

The following method was devised in order to find common elements: (1) decomposition of the lexicon used in the sub-corpus into constitutive semantic features; (2) setting up the ideal structure of a definition of burnout through a hierarchical structure based on hyponyms and hyperonyms independently from whether they are effectively attested or only implied in the definitions; and (3) reasoned filling of the structure with the hyponyms and hyperonyms found in the definitions. During the semantic analysis this method needed to be slightly adapted, as shown in the next section.

5 Semantic analysis

5.1 Phase 1: The search for common elements in the sub-corpus

As a first step, it was assessed which content words (or phrases) potentially interpretable as symptoms are present in the sub-corpus. In order to isolate the symptoms belonging to the health condition ‘occupational burnout’, information about its outbreak context (i.e., workplace) and the specific population prone to it, if any (e.g., dedicated and committed people), were excluded. Rare metaphorical expressions such as ‘a feeling of “just going through the motions”’ (D9) were not taken into consideration in this first phase of the semantic analysis, as it is difficult to interpret such a metaphor in terms of specific symptoms. It was evident from the beginning that it was necessary to deal with units bigger than single content words. Three situations were encountered.

(A) *A symptom is expressed through one content word, e.g., ‘fatigue’, ‘frustration’, ‘sleeplessness’, etc.*

(B) *A symptom is expressed through a phrase based on a nominal or a nominalised form (-ing) on which other content words depend*, e.g., 'staff member's quickness to anger', 'suffering from frequent headaches and gastrointestinal disturbances'. In such cases only the word indicating (potential) symptoms – often the phrase head – was retained. Adjectives and other specifications were retained only if they were essential for distinguishing one kind of symptom from another, i.e., to avoid ambiguity or vagueness. 'Staff member' is not an essential specification, as the papers retained for the systematic review were all dealing with workers. As no hint is given as to how to measure the 'quickness' with which someone gets angry, the only term retained as a symptom was 'anger'. 'Frequent' in the phrase 'frequent headaches' does not allow a more specific health condition to be identified (though see below what is said about 'migraine headaches'): therefore only 'headache' was retained. 'Gastrointestinal disturbance' was taken as a multi-word symptom, as the adjective is functional to distinguish a certain kind of disturbance from other disturbances.

(C) *The presence of a symptom is expressed in a discursive way*, e.g., 'they lose all concern': in this case the expression was reduced to a phrase of the type discussed above and treated in the same way. 'They lose all concern' was changed into the noun phrase 'loss of concern'. Unlike contemporary approaches to terminology that are broadly usage-based (e.g., Faber 2015), we decided not to use templates featuring verbs and their arguments (for example, verb 'lose', first argument 'worker', second argument 'concern'). This would sometimes have required introducing terms which are not explicitly in the texts, while we wanted to be – as far as possible – faithful to the meaning intended by the author.

In this way (cf. B and C above), it was possible to consider only single terms and noun phrases as isolated semantic elements independent from a specific and actualising syntactic context. As the scope of the semantic analysis was not that of analysing polysemy or the syntagmatic differences of a term in different expressions, this way of proceeding appears justified. However, unlike classical decompositional approaches (cf. Chierchia and McConnell-Ginet 2000), in this research it was not possible to deal purely with units at the lexical level, as the definitions show the lexicon as it is used and it was not possible to reduce any phrase to one smaller unit such as the word: for instance, 'loss of concern' could not become 'disinterest' without losing the idea of change contained in 'loss'.

It is important to stress that at this stage the outbreak level to which a term or a multiword phrase refers was not taken into consideration. In fact, general descriptions within the definitions are most common, so that there is a certain tendency to not separate clearly what belongs to different levels, e.g., D2: 'They lose all concern, all emotional feeling, for the persons they work with and come

to treat them in detached or even dehumanized ways, where the psychological and behavioural levels are not clearly distinguished from one another. Each semantic unit recognisable as a symptom was then decomposed into semantic features and, where possible, hyperonyms were used or introduced, in order to create a provisional taxonomy.

It is a well-known problem of lexical decomposition that the choice of features (or 'properties', depending on the theoretical background) to 'decompose' the semantics of a word is largely arbitrary (Lyons 1977: 333–334). It must be stressed that, while this weakness is certainly problematic to construing a valid semantic theory, for the practical goal of finding common elements among different definitions this weakness turned out to be helpful, allowing for a certain degree of flexibility in the choice of how to name the features. The features of the isolated semantic units were chosen by discussing their meaning with the epidemiologist and the psychologist and on the basis of relevant scientific literature. Controlled vocabularies were also taken into consideration, although their use could be misleading. An example will make this point clear.

One can wonder whether Freudenberger (D1) uses the term 'sleeplessness' in the same way (i.e., pointing at the same referent) as Maslach (D2) and/or as – some decades later – Gundersen (D9) uses the term 'insomnia'. In everyday language sleeplessness and insomnia are often considered as synonyms (e.g. the Wikipedia entry for 'Insomnia' currently refers to 'insomnia, also known as sleeplessness [...]')⁵, but, while 'insomnia' is classified as a 'disorder' in the ICD-11, 'sleeplessness' does not appear as a specific independent disorder. As it is impossible to establish whether this is one and the same concept (sleeplessness could be intended as a general lack of sleep, while insomnia could be intended as referring specifically to the inability to fall asleep), it was decided to consider 'sleeplessness' and 'insomnia' as two different symptoms. In terms of semantic features 'sleeplessness' and 'insomnia' share [+ BEING RELATED TO SLEEP] and [+ DISORDER] (note that here 'disorder' is not intended as a medical term), though it is not possible to better define their exact difference. It must be underscored that such problems could be also due to the chronological distance between older and newer definitions and/or due to domain-related differences in the approach to burnout.

Once common features were found, the isolated semantic units were organised in a taxonomy by using hyperonyms present in the sub-corpus or by introducing suitable ones.⁶ We may not be able to say whether 'sleeplessness' and 'insomnia' refer to exactly the same state in the view of the authors who suggested these terms for the definition of burnout, but we can be sure that both terms refer to 'sleep disorders'. At a non-scientific and non-specialist level, 'sleep disorder' is also suggested as hyperonym of 'insomnia' by Princeton University's lexical database WordNet.⁷ The point to be made here is

that we can agree on the choice of a hyperonym, while the hyponyms remain underspecified.

As in the case of the choice of the exact semantic features, the choice of the particular hyperonym is also arbitrary. One could have chosen 'sleep troubles' instead of 'sleep disorders': without the use of a controlled (medical) vocabulary one term is as good as the other. However, 'sleep disorders' was judged as more suitable by the epidemiologist and the psychologist from the point of view of medical vocabulary: 'disorder' is defined in SNOMED-CT, while 'trouble' is not.

The carrying out of the analysis in terms of hyponyms and hyperonyms was often very problematic, as such linguistic notions are strictly bound to the configuration of the lexicon of a language (here English). While 'sleep disorder' seems acceptable as a hyperonym in English, the situation is completely different with other noun phrases. For example, one definition mentions 'headaches' (D1: 'frequent headaches'), another 'migraine headaches' (D2). One can decompose 'migraine headache' into [+ PAIN], [+ RELATED TO THE HEAD], [+ DUE TO MIGRAINE] and consider it a more specific symptom than 'headache' ([+ PAIN], [+ RELATED TO THE HEAD]). However, at the semantic and pragmatic levels, one can wonder whether the 'frequent headaches' of D1 do not coincide with 'migraine' *tout court*, as migraine headaches can become 'very frequent' according to ICD-11 (see 8A80 migraine), or whether 'migraine' is not an implicit symptom of burnout, if 'migraine headache' is a symptom. Although both hypotheses would be possible, such speculations were avoided and did not have any impact on the final results.

After each single term or multi-word expression had been analysed and discussed, the semantic features contained in the sub-corpus were reorganised into a provisional taxonomy according to three principles.

(1) *A term or phrase must occur in at least three definitions* (repetitions in the same definition do not count). The choice of this number is arbitrary, but justified, as a low number means that potentially interesting information should not be lost.

(2) *If at least three terms or phrases can be categorised under a superordinate concept not explicitly mentioned in the definitions* (e.g., 'sleep disorders', see above), *after having compared their semantic features* ('sleeplessness' and 'insomnia'), *the superordinate concept must be introduced*. Because of this principle, potentially shared symptoms were not completely lost. In fact, not even the presence of a symptom mentioned less than three times is erased, as its existence in the sub-corpus justifies the presence of a superordinate concept and the relevant hyperonym: 'headache' is mentioned only twice (D1, D2) and neither the feature [+ PAIN] nor the feature [+ RELATED TO THE HEAD] emerged in other

definitions. However, 'headache' can be associated with the physical outbreak level. In this case, we took into consideration the presence of symptoms at the physical outbreak level, but without further specification. This choice revealed itself as a good strategy, particularly in the case of an underrepresented outbreak level such as the behavioural level (see below).

(3) *The retained – or newly introduced – terms or phrases must be compared in terms of their semantic features and attributed to a higher conceptual level (e.g., 'deterioration of physical well-being' [D2]) or a lower conceptual level (e.g., 'sleep disorders').*

In order to reorganise the isolated terms and phrases in a taxonomy, attention was paid to whether the authors explicitly used some term to refer to a superordinate concept (not necessarily a hyperonym *stricto sensu*). The following superordinate concepts emerged: the physical, psychological and behavioural levels; the context (i.e., workplace); and the population. As already hinted at, the context was determined by the focus of the study. References to the population were not taken into account, as they do not refer to symptoms.

As already mentioned at the beginning of this section, it emerged that the outbreak levels of the (potential) symptoms were not always clearly distinguishable. For example, while it is clearly stated that 'exhaustion' refers to the physical level in D1 and D2, to the psychological level in D5 and D7 and to both levels in D3, D6 and D11, the level is less clear for D8, D9 and D10. It also emerged that some elements needed an in-depth discussion with the medical experts of the team in order for these to be appropriately arranged in the taxonomy. This led to the second phase, in which the structure of an ideal definition was set up.

5.2 Phase 2: Setting up the structure of a symptom-based definition of burnout

The results of the preceding phase were evaluated and, when necessary, vocabulary considered more fitting for medical terminology was introduced. Each symptom was discussed, in order to develop the basic scheme which had emerged in Phase 1 into a more complex one (i.e., with a deeper structure, see below) and to better specify the shared elements.

The following structuring principles illustrate the layers of a scientific medical definition of burnout. At the first and highest level we find the three (parallel) outbreak levels discussed above: the psychological, the physical and the behavioural. At the second hierarchical level, we find the specification of the type of outbreak, here intended as the deterioration of a healthy condition at the psychological and the physical levels and as the emergence of dysfunctions at the behavioural level. At the third level, we find hyperonyms referring to higher-ordered concepts whose hyponyms appear in at least three defini-

tions. At the fourth and a fifth levels, we find specific symptoms associated with the immediately upper level. These could appear in less than three definitions, as in the case of 'headache'.

It should be mentioned here that the levels of manifestation of the phenomena are not always clearly separable from each other: e.g. a negative attitude at the psychological level that manifests itself also at the behavioural level. The progress of research will perhaps allow us also to distinguish more clearly other levels of outbreak such as the emotional, which we included in the psychological level.

The described procedure resulted in the schema presented in Figure 1, where hyperonyms or more generally taxonomic levels not explicitly present in the sub-corpus are marked in italics. The fifth level is not represented, for reasons of space.

• **Psychological level**

— *deterioration of well-being*

- exhaustion
 - emotional exhaustion
 - mental exhaustion
- weariness
 - cognitive weariness (attention)
 - demotivation
 - inability to cope
- negative attitude
 - frustration
 - negative feeling about oneself
 - dehumanisation
- detachment/distancing
 - *detachment towards co-workers*
 - *detachment towards clients*

• **Physical level**

— *deterioration of well-being*

- *recovery problems*
 - *sleep disorders*
- *state of physical exhaustion and/or fatigue*
 - physical exhaustion
 - fatigue

• **Behavioural level**

— *dysfunctional behaviours*

- *relational inability*
 - regarding clients
 - regarding co-workers
- cynicism (*disengagement*)

Figure 1. The levels of the definition of burnout

The introduction of the following hyperonyms expressing a symptom or a closely related concept of a superordinate level was validated by the team:

- ‘*deterioration of well-being*’ under the ‘psychological level’ and ‘*dysfunctional behaviour*’ under the ‘behavioural level’: the two expressions allowed a second level introducing the notion of ‘deviation from psychological well-being or from normal behaviour’ respectively, on the model of the physical level (‘deterioration of physical well-being’ is explicitly mentioned in D2);
- ‘*recovery problems*’: this was introduced in order to have a level connecting ‘deterioration of well-being’ in level 2 and the more specific ‘sleep disorders’, even though it was known that in the definitions no term refers to this level.
- ‘*state of physical exhaustion and/or fatigue*’: no fitting hyperonym was found covering the concepts of ‘physical exhaustion’ and ‘fatigue’;
- ‘*relational inability*’: this higher-level symptom was introduced to take into account a number of very specific terms and expressions, such as ‘(a staff member’s) quickness to anger’ or ‘(his/her instantaneous) irritation’ in D1;
- ‘*disengagement*’ was suggested as an alternative to ‘cynicism’ (D2, D3, D5) – the latter is a vague term when used in medical contexts, and we judged that in the sub-corpus it was used to refer to an attitude of taking distance;
- a parallel distinction between ‘*clients*’ (people external to an enterprise) and ‘*co-workers*’ was introduced for ‘detachment/distancing’ at the psychological level as well as for ‘relational inability’ at the behavioural level – this is due to the fact that some definitions explicitly mention ‘clients’ (see in particular D11: ‘client-related burnout’), while others are less specific (e.g., D2: ‘for the persons they work with’); and
- ‘*sleep disorders*’: the hyperonym for ‘insomnia’ and ‘sleeplessness’.

In the following phase the number of times a symptom or a superordinate concept appears in the sub-corpus was assessed.

5.3 Phase 3: The assessment of the relevance of each symptom and of the superordinate concepts

In the third phase the terms and phrases which were isolated in Phase 1 were attributed to one level of the multi-layered structure developed in Phase 2. Once more, the lack of a precise definition for the terms used by the authors sometimes made it difficult to attribute a term to the concepts of the structure. In the case of ‘exhaustion’ mentioned above, if it is not clear from the text to which outbreak level the term refers, it was attributed to any suitable outbreak

level: e.g., 'exhaustion' was attributed to both the physical level and the psychological level.

An important clarification must be made about the calculation of the results. We have seen that the authors use many different, but often quite specific terms. These can be considered to share common features, in that they refer to a higher and more generic level. For example, Freudenberger has a list of very specific terms which do not appear in later definitions, such as (being unable to shake a) 'lingering cold', (suffering from frequent) 'headaches and gastrointestinal disturbances', 'sleeplessness', 'shortness of breath'. It is not the number of elements for each symptom for each definition that counts, but the fact that a hyponym or a phrase which can be attributed to a superordinate level is used at least once. This is why the four elements cited by Freudenberger and reported above count for their presence as a whole, not as single elements. The goal of the third phase was to see whether a level is covered or not.

Another important clarification concerns the fact that the presence of a symptom at a lower level determines its presence also at the higher levels. For example, 'sleep disorders' implies 'recovery problems', which further implies 'deterioration of well-being'.

Finally, in an upper level there may be elements which do not fit any sub-level of the taxonomy (e.g., D4: 'anxiety'), or generic ones which are not better specified (e.g., D3: 'vulnerability to disease'). Such terms do not need to be symptoms, but may correspond to some particular conditions mentioned in the original reference definitions. If there are other elements at a lower level for the same definition, they all (those present only at a higher level and those present at a lower level) count as just one element at the upper level, as what counts for the shared definition is the presence of a level, not the specific symptom.

The attribution of the symptoms to the various levels can be seen in the Supplementary Online Material. The calculation of the presence of symptoms led to the results contained in Table 2.

Only the terms of the structure with a score of more than half (≥ 6) out of the total number of definitions (11) were kept to construct a proposition for a definition of burnout based on shared elements. The benchmark definition confirmed the importance of the symptoms isolated in this way, while showing the increasing importance given to some other symptoms in a diachronic perspective; e.g., 'weariness' as a psychological symptom appears in only 5 out of 11 definitions, but it is present in the benchmark definition.

At the psychological level, 'deterioration of well-being' has a score of 11 out of 11. Since the score is high, it is useful to consider the scores of the sub-levels. 'Exhaustion' has a score of 8 out of 11, while 'negative attitude' has a score of 7 out of 11. As already mentioned, 'weariness' has a score of 5 out of 11, but it is 6 out of 12 if the benchmark definition is also taken into account.

Table 2. Calculation of the presence of symptoms in the reference and in the benchmark definition

	Sub-corpus (D1–D11)	Benchmark definition (D12)	Total
Psychological level			
deterioration of well-being	11	1	12
exhaustion	8	1	9
emotional exhaustion	4	-	4
mental exhaustion	1	-	1
weariness	5	1	6
cognitive weariness (attention)	3	-	3
demotivation	2	-	2
inability to cope	2	-	2
negative attitude	7	-	7
frustration	4	-	4
negative feeling about oneself	4	-	4
dehumanisation	3	-	3
detachment/distancing	5	1	6
detachment towards co-workers	2	-	2
detachment towards clients	1	-	1
Physical level			
deterioration of well-being	9	1	10
recovery problems	3	-	3
sleep disorders	3	-	3
state of physical exhaustion and/or fatigue	9	1	10
physical exhaustion	7	1	8
fatigue	4	1	5
Behavioural level			
dysfunctional behaviours	5	-	5
relational inability	3	-	3
regarding clients	-	-	-
regarding co-workers	1	-	1
cynicism (disengagement)	2	-	2

At the physical level, ‘deterioration of well-being’ has a score of 9 out of 11. Since the score is high, it is useful to consider the scores of the sub-levels. ‘State of exhaustion and/or fatigue’ has a high score of 9 out of 11, so ‘state of exhaustion and/or fatigue’ can be considered a fundamental symptom. While ‘physical exhaustion’ has a high score (7 out of 11), ‘fatigue’ has not (5 out of 11).

At the behavioural level, ‘dysfunctional behaviours’ has a score of 5 out of 11. Since this score is low, there are no symptoms shared at this level and more

research on burnout and in particular on its diagnostic criteria is needed to better define which dysfunctional behaviours appear.

It was then possible to suggest a definition of burnout based on shared elements. Before presenting this, it is worthwhile to conclude this outline of the implemented methodology by noting that this work also allowed us to see the old problems of semantic theory in a new light. In fact, as predicted by the theory, the semantic decomposition process revealed itself as a powerful means for detecting ambiguity and vagueness (Engelberg 2011: 125). Interestingly, some weaknesses of semantic decomposition (Engelberg 2011: 129–130) turned out to be advantages. For example, it is a well-known problem that semantic features are not universal and that their formulation can vary from researcher to researcher or that semantic features are often not exhaustive. While both issues are certainly a problem for a theory of semantics, the first gave the team a flexible tool for choosing how to name the features, while the latter allowed the team to work with vague terms. Finally, the identification of co-hyponyms, although a problem if they have to be defined exactly, allowed the team to set up superordinate levels in the taxonomy.

According to the results of the method described above, burnout can be defined as a syndrome characterised *at least* by the following symptoms:

At the psychological level, there is 'deterioration of well-being'. This implies 'exhaustion', 'weariness' and 'negative attitude'. At the physical level, there is also 'deterioration of well-being' with the presence of 'physical exhaustion'. At the behavioural level, it is not yet possible to specify any symptom.

In another stage of the project, which we do not deal with in this paper (cf. Guseva Canu *et al.* 2021), the terms were checked against the SNOMED-CT-controlled vocabulary and a new definition was created on the basis of the above-mentioned one. This was submitted to the experts of a Delphi panel, which was mainly composed of physicians and psychologists having a minimum of 15 years' research and/or clinical experience.

6 Conclusion

During our interdisciplinary and interprofessional collaboration we had to conciliate the fundamental importance given to the use of controlled vocabulary in healthcare professions (for medicine, see Shahpori and Doig 2010; Millar 2016) with linguistic methods mainly designed for investigating how language (especially, semantics) works. As such, this paper stems from the irreducible tensions between a prescriptive use of language and its descriptive investigation.

The goal of our methodology was that of applying linguistic methods to a concrete problem in healthcare praxis in order (1) to find the shared elements of the original reference definitions of 'burnout'; and (2) to set up a template

of definition where the common elements can be placed. We hope that the outlined method will be useful also for other researchers and will be tested in future works assessing the degree of similarity of definitions (or short texts) in any field of research.

There are a number of issues that this paper does not cover or has covered in only a partial way. One is the need to shape ‘burnout’ as the same object of study for the whole scientific community (and then also for our society). In other words, in order for any definition of burnout to work (at least inside some work environments), we need first of all to agree on what can be recognised as burnout and how. In Goodwin’s (1994) terms, we need to implement a shaping process that is able to create ‘burnout’ as the same object of knowledge. There are at the moment too many ‘objects’ recognised as ‘burnout’ for any definition to be easily accepted by the community of scientists and practitioners (as shown by Schaufeli 2021; Sibeoni *et al.* 2021: 522). The team working on the semantic analysis outlined in this paper – and the further work described by Guseva Canu *et al.* (2021) – marks the beginning of a long journey towards a shared definition of ‘burnout’, by providing a definition based on potentially shared elements of the reference definitions. Much work is still needed.

Conflict of interest statement

None declared.

Appendix

The 11 original definitions of ‘burnout’ ordered chronologically with the definition used as a benchmark (if not indicated otherwise, English text in italics means that the content was reformulated)

(D1) Freudenberger (1974: 160)	The physical signs are easy to spot. For one, there is a feeling of exhaustion and fatigue, being unable to shake a lingering cold, suffering from frequent headaches and gastrointestinal disturbances, sleeplessness and shortness of breath. [...] A staff member’s quickness to anger and his instantaneous irritation and frustration responses are the [behavioral] signs.
(D2) Maslach (1976: 16, 19)	[...] they [people who work intensively with others] are often unable to cope with this continual emotional stress and burnout occurs. They lose all concern, all emotional feeling, for the persons they work with and come to treat them in detached or even dehumanized ways. [...] The worker’s feelings about people often show a shift toward the cynical or negative. [...] Burnout often leads to a deterioration of physical well-being. The professional becomes exhausted, is frequently sick and may be beset by insomnia, ulcers and migraine headaches, as well as more serious illnesses.

(D3) Pines and Maslach (1980: 6)	Burn-out is a syndrome of emotional exhaustion and cynicism that can occur among individuals who spend much of their time working closely with other people. It involves a gradual loss of concern for these other people and the development of callous and even dehumanized attitudes towards them, and it can sometimes result in negative feelings about oneself as a professional helper or care-giver. The emotional fatigue of burn-out can have detrimental effects on the individual's job performance (as reflected in lower morale and greater absenteeism and turnover), as well as on his or her physical health (increased physical exhaustion, psychosomatic symptoms, and vulnerability to disease). Furthermore, it can seriously affect the individual's psychological well-being and impair his or her ability to relate to people in general (and not just to the recipients of his or her professional services). Burn-out is not unique to a particular group of individuals but is found among most health and service professions where staff members are required to work intensively with people on a large-scale, continuous basis in situations that can be emotionally demanding [...].
(D4) Cherniss (1980)	<i>Professional burnout is described [by Cherniss] as a syndrome of many negative factors. These include stress, strain, boredom, self-doubt, dissatisfaction, insecurity, disappointment, and frustration. Burnout is usually experienced by some newly trained professionals who are employed in large bureaucratic public agencies, frequently during their first professional appointment.</i>
(D5) Maslach and Jackson (1981: 99)	Burnout is a syndrome of emotional exhaustion and cynicism that occurs frequently among individuals who do 'people-work' of some kind. A key aspect of the burnout syndrome is increased feelings of emotional exhaustion. As their emotional resources are depleted, workers feel they are no longer able to give of themselves at a psychological level. Another aspect is the development of negative, cynical attitudes and feelings about one's clients. Such negative reactions to clients may be linked to the experience of emotional exhaustion, i.e. these two aspects of burnout appear to be somewhat related. This callous or even dehumanized perception of others can lead staff to view their clients as somehow deserving of their troubles [...], and the prevalence among human service professionals of this negative attitude toward clients has been well documented [...]. A third aspect of the burnout syndrome is the tendency to evaluate oneself negatively, particularly with regard to one's work with clients. Workers feel unhappy about themselves and dissatisfied with their accomplishments on the job.
(D6) Pines and Aronson (1981)	<i>Burnout is identical to tedium in terms of definition and symptomology but is unique to people who work with people in situations that are emotionally demanding. Tedium is the experience of physical, emotional, and mental exhaustion. It is characterized by emotional and physical depletion and by the negation of one's self, one's environment, one's work, and one's life.</i>

(D7) Shirom (1989: 32, 33–34)	Individual level phenomenon. [...] A negative emotional experience. [...] A chronic, ongoing feeling. [...] the unique content of burnout has to do with the depletion of an individual's energetic resources. Specifically, burnout refers to a combination of physical fatigue, emotional exhaustion, and cognitive weariness. [...] There are several underlying assumptions often made by burnout researchers that need to be discarded if one accepts the core definition of burnout [...] They need not, and should not be restricted to individuals whose work requires large amounts of contact with people in need of aid [...]. Therefore, a theory of burnout must not allow itself to be exclusively concerned with the people occupations. Yet another assumption often made by burnout researchers [...] is that the term exhaustion means that the burnout syndrome is most relevant for job holders whose work is very involving. In fact, most studies reported moderate negative correlations between burnout and work involvement or commitment [...]. A third assumption found in burnout research is that it is often preceded by high levels of arousal [...]. Again, this is not necessarily implied by the above core definition.
(D8) Schaufeli and Enzmann (1998: 19, 20–25, 36)	Myriad possible burnout symptoms [132 symptoms are displayed on table 2.1] and definitions exist. [...] The categorisation used in Table 2.1 follows the common classification of psychological symptoms in five clusters: affective, cognitive, physical, behavioural, and motivational. In addition, three levels are distinguished since burnout typically includes not only individual symptoms, but also symptoms at the interpersonal and organisational levels. [...] Burnout is a persistent, negative, work-related state of mind in 'normal' individuals that is primarily characterised by exhaustion, which is accompanied by distress, a sense of reduced effectiveness, decreased motivation, and the development of dysfunctional attitudes and behaviours at work. This psychological condition develops gradually but may remain unnoticed for a long time by the individual involved. It results from a misfit between intentions and reality in the job. Often burnout is self-perpetuating because of inadequate coping strategies that are associated with the syndrome. This working definition of burnout specifies its general symptomatology, its pre-conditions, as well as the domain on which it occurs. More specifically, the definition narrows down over 100 burnout symptoms to one core indicator (exhaustion) and four accompanying, general symptoms: (1) distress (affective, cognitive, physical, and behavioural); (2) a sense of reduced effectiveness; (3) decreased motivation; (4) dysfunctional attitudes and behaviours at work. Furthermore, frustrated intentions and inadequate coping strategies play a role as preconditions in the development of burnout and the burnout process is considered to be self-perpetuating despite the fact that it may not be recognised initially. Finally, the domain is specified: the symptoms are work-related and burnout occurs in 'normal' individuals who do not suffer from psychopathology.
(D9) Gundersen (2001: 145)	Burnout has many characteristics, including fatigue, exhaustion, inability to concentrate, depression, anxiety, insomnia, irritability, and sometimes increased use of alcohol or drugs. Probably the most distinct characteristic of burnout is a loss of interest in one's work or personal life, a feeling of 'just going through the motions.'

(D10) Demerouti, Bakker, Nachreiner and Schaufeli (2001: 508)	This state, where both exhaustion and disengagement are simultaneously present, represents the <i>burnout syndrome</i> . According to our conceptualization, burnout represents a dichotomous and not a continuous trait, as in Maslach's concept, where burnout can have low, medium, or high levels [...]. [emphasis in the original]
(D11) Kristensen, Borritz, Villadsen and Christensen (2005: 196–197)	In the CBI the core of burnout is <i>fatigue</i> and <i>exhaustion</i> . [...] While “the flat battery” remains the main metaphor for burnout, it is important to emphasize that burnout is not just fatigue or exhaustion. If this were the case we would not need the concept at all. In our understanding of the concept the additional key feature is the <i>attribution</i> of fatigue and exhaustion to specific <i>domains</i> or spheres in the person's life. One such domain is <i>work</i> and a more specific domain is <i>client work</i> . [...] We define work-related burnout as ‘The degree of physical and psychological fatigue and exhaustion that is perceived by the person as related to his/her work’. [...] <i>Client-related burnout</i> is defined as follows: The degree of physical and psychological fatigue and exhaustion that is perceived by the person as related to his/her work with clients. [emphasis in the original]

Definition published after the review was finished

(D12) Schaufeli, De Witte and Desart (2019: 31)	<p><i>Burn-out kan beschreven worden als een werkgerelateerde aandoening die voorkomt bij diegenen die gedurende een langere periode productief en zonder problemen hebben gewerkt tot tevredenheid van zichzelf en anderen. Extreme vermoeidheid, ontregeling van emotionele en cognitieve processen, én mentaal afstand vormen de kernelementen van de aandoening. Het zich mentaal distantiëren kan gezien worden als een disfunctionele poging om verdere uitputting te voorkomen. Deze kern-symptomen worden vergezeld door secundaire symptomen, zoals depressieve gevoelens, en psychosomatische- en psychische spanningsklachten.</i></p> <p>Burnout is a work-related condition that occurs in those who have worked productively and without problems for a long period to the satisfaction of themselves and others. Extreme fatigue, disruption of emotional and cognitive processes, and mental distance are the core elements of the disorder. The mental distance can be seen as a dysfunctional attempt to prevent further exhaustion. These core symptoms are accompanied by secondary symptoms, such as depressive feelings, and psychosomatic and psychological stress complaints [Free translation]</p>
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Supplementary Online Material

A semantic analysis of definitions of burnout is available online here: <https://journal.equinoxpub.com/JALPP/article/view/21266>

Notes

1. COST action 16216 – *Network on the Coordination and Harmonisation of European Occupational Cohorts (Omega-Net)*. Its main goal is ‘to foster safe and healthy preventive strategies and policies’ at work by identifying ‘health risks and gains related to occupation and employment’ (<http://omeganetcohorts.eu/>). All the URLs provided in this paper were checked in October 2021.

2. No definition of the burnout syndrome appears in the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5). The burnout syndrome is only mentioned once, as a condition related to another syndrome (American Psychiatric Association 2013, 836). The WHO states that burn-out 'is included in the 11th Revision of the International Classification of Diseases (ICD-11) as an occupational phenomenon. It is *not* classified as a medical condition' (World Health Organization 2019, emphasis in the original text).
3. This definition originally stems from Maslach and Jackson (1981).
4. It should be noted that one of the limits of the systematic review is that some definitions refer to lists of symptoms which were not analytically taken into account in the setting up of the sub-corpus.
5. Wikipedia: <https://en.wikipedia.org/wiki/Insomnia>.
6. See, e.g., Engelberg (2011: 126 – 'iff' means 'if and only if'): 'assuming that a lexeme A is a hyperonym of a lexeme B iff the set of properties conjoined in the lexical decomposition of lexeme A is a proper part of the set of properties conjoined in the lexical decomposition of lexeme B, we derive that child (3a) is a hyperonym of girl (3b). (3) a. *child*: $\lambda x[\text{HUMAN}(x) \ \& \ \neg\text{ADULT}(x)]$ b. *girl*: $\lambda x[\text{HUMAN}(x) \ \& \ \neg\text{ADULT}(x) \ \& \ \text{FEMALE}(x)]$ '. The method has its limits. As is well known (see Lyons 1977: 334), an adult person of female sex may still be called a 'girl' under certain circumstances (for example as a young adult), unless the propriety of 'being adult' is precisely defined ('to be at least 18 years old').
7. WordNet: <https://wordnet.princeton.edu/>.

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