

Mini-Z validation for burnout and stress evaluation: an observational study

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Summary. Background. The Mini-Z is a questionnaire created to evaluate the levels of burnout in healthcare workers. It consists of 10 items rated using a 5-point Likert scale and one open question. It explores three outcomes (burnout, stress and satisfaction) and seven drivers of burnout (work control, work chaos, teamwork, values alignment with leadership, documentation time pressure, EMR use at home, and EMR proficiency). The aim of this study is to validate the Italian version of the Mini-Z, comparing it with the other most used scales.

Materials and methods. We recruited a sample of 120 healthcare professionals and administered all three questionnaires to each of them, after which we compared the answers and the scores of the results. A cross-sectional study among healthcare workers was conducted from May to July 2022. An online questionnaire was sent, by e-mail, to 120 healthcare workers (60.8% male, 39.2% female), aged between 18 and 60 years old (26.8% between 25 and 38 years old). They were invited to answer to an anonymous survey, consisting of three assessment instruments: Copenhagen Burnout Inventory (CBI), Maslach Burnout Inventory (MBI) and Mini-Z Inventory 2.0. The Mini-Z 2.0 is a new and easier tool to assess burnout syndrome, actually validated only in English. It was translated into Italian by reverse translation. Cronbach's Alpha coefficient, a statistical index, was used to assess its reliability. The last phase of the study compared the Mini-Z, the CBI and the MBI, by means of Pearson's coefficient, to highlight the Mini-Z's ability to be used for Burnout assessment. **Results.** The analysis of the results showed that 18.3% of the interviewed healthcare professionals scored equal (2.5%) or higher (15.8%) than 40. The average percentage value was 33.35%, with a standard deviation of 6.3%. This emphasises, therefore, that this portion of employees is more or less satisfied with their working environment. The remaining portion of employees, on the other hand, 81.7%, scored below 40, emphasising an unpleasant and unjoyful working environment. **Discussion and conclusions.** Burnout is very common among employees and especially among healthcare workers and a routine assessment seems to be necessary to be able to prevent the syndrome. The Italian version of the Mini-Z includes ten items, is more user-friendly and aims to assess not only Burnout subscales, as in the previous tests, but also well-being factors and has applied a rigorous approach, including forward translation, back translation and cognitive debriefing.

Key words. Assessment, burnout, Mini-Z, stress.

Validazione del questionario Mini-Z per la valutazione del burnout e dello stress: uno studio osservazionale.

Riassunto. Scopo. Il Mini-Z è un questionario creato per valutare i livelli di burnout negli operatori sanitari. È composto da 10 item valutati con una scala Likert a 5 punti e da una domanda aperta. Esplora 3 risultati (burnout, stress e soddisfazione) e 7 fattori di burnout (controllo del lavoro, caos lavorativo, lavoro di squadra, allineamento dei valori con la leadership, pressione sui tempi di documentazione, uso dell'EMR a casa e competenza nell'EMR). Lo scopo di questo studio è quello di validare la versione italiana del Mini-Z, confrontandola con le altre scale più utilizzate. **Materiali e metodi.** Abbiamo reclutato un campione di 120 operatori sanitari e abbiamo somministrato i 3 questionari a ciascuno di loro, dopodiché abbiamo confrontato le risposte e i punteggi dei risultati. È stato condotto uno studio trasversale tra operatori sanitari da maggio a luglio 2022. Un questionario online è stato inviato, via e-mail, a 120 operatori sanitari (60,8% maschi, 39,2% femmine), di età compresa tra i 18 e i 60 anni (26,8% tra i 25 e i 38 anni). Sono stati invitati a rispondere a un'indagine anonima, composta da tre strumenti di valutazione: Copenhagen Burnout Inventory (CBI), Maslach Burnout Inventory (MBI) e Mini-Z Inventory 2.0. Il Mini-Z 2.0, validato solo in inglese, è stato tradotto in italiano mediante traduzione inversa. Per valutarne l'affidabilità è stato utilizzato il coefficiente Alpha di Cronbach. L'ultima fase dello studio ha messo a confronto il Mini-Z, il CBI e il MBI, attraverso il coefficiente di Pearson, per evidenziare la capacità del Mini-Z di essere utilizzato per la valutazione del burnout. **Risultati.** L'analisi dei risultati ha mostrato che il 18,3% degli operatori sanitari intervistati ha ottenuto un punteggio uguale (2,5%) o superiore (15,8%) a 40. Il valore percentuale medio è stato del 33,35%, con una deviazione standard del 6,3%. Ciò sottolinea, quindi, che questa porzione di dipendenti è più o meno soddisfatta del proprio ambiente di lavoro. La restante parte dei dipendenti, invece, l'81,7%, ha ottenuto un punteggio inferiore a 40, sottolineando un ambiente di lavoro sgradevole e poco piacevole. **Discussione e conclusioni.** Il burnout è molto comune tra i dipendenti e soprattutto tra gli operatori sanitari e una valutazione di routine sembra essere necessaria per poter prevenire la sindrome. La versione italiana del Mini-Z comprende 10 item, è più facile da usare e mira a valutare non solo le sottoscale del burnout, come nei test precedenti, ma anche i fattori di benessere e ha applicato un approccio rigoroso, che comprende la traduzione in avanti, la traduzione inversa e il debriefing cognitivo.

Parole chiave. Burnout, Mini-Z, stress, valutazione.

Introduction

In ICD-11 of the World Health Organization, burnout is defined as follows: «Burn-out is a syndrome conceptualized as resulting from chronic workplace stress that has not been successfully managed. It is characterized by three dimensions: feelings of energy depletion or exhaustion, increased mental distance from one's job, or feelings of negativism or cynicism related to one's job; and reduced professional efficacy»¹.

Different tools have been developed to identify and evaluate Burn-out syndrome: Maslach Burnout Inventory (MBI), Copenhagen Burnout Inventory (CBI) and Mini-Z.

The MBI is designed to assess the three components of the burnout syndrome: emotional exhaustion, depersonalisation and reduced personal accomplishment. There are 22 items, which are divided in three subscales: 9 items in emotional exhaustion subscale, 5 items in depersonalisation subscale, 8 items in personal accomplishment subscale².

The CBI is a 19 items questionnaire, developed to measure burnout in 3 different domains: personal burnout, work-related burnout, and client-related burnout.

The questions on personal burnout are inspired by the BM questionnaire, but with different response options; the questions on work related burnout are inspired by the subscale on emotional exhaustion of the MBI/MBI-GS questionnaires, with the exception of the item on energy for family and friends; the questions on client-related burnout were formulated by Tage S. Kristensen and Marianne Borritz and they are only defined for those respondents who worked with clients. The CBI is very accurate for healthcare professionals³.

The Mini-Z is a questionnaire created to evaluate the levels of burnout in healthcare workers. It consists of 10 items rated using a 5-point Likert scale and one open question. It explores three outcomes (burnout, stress and satisfaction) and seven drivers of burnout (work control, work chaos, teamwork, values alignment with leadership, documentation time pressure, EMR use at home, and EMR proficiency)^{4,5}.

Currently the most used tools for the assessment of burnout are the MBI (22 items), followed by the CBI (19 items). The number of questions in these two scales determines an increasing loss of attention of the subject answering the questions: the greater the number of items, the less attention the subject pays in answering the questions and sometimes the tester is even led to refuse completing the questionnaire.

The aim of this study is to validate the Italian version of the Mini-Z, comparing it with the other most used scales. We recruited a sample of 120 healthcare professionals and administered all three questionnaires to each of them, after which we compared the answers and the scores of the results.

Materials and methods

A cross-sectional study among healthcare workers was conducted from May to July 2022. An online questionnaire was sent, by e-mail, to 120 healthcare workers (60.8% male, 39.2% female), aged between 18 and 60 years old (26.8% between 25 and 38 years old). They were invited to answer to an anonymous survey, consisting of three assessment instruments: CBI, MBI and Mini-Z Inventory 2.0 (table 1 presents the general characteristics).

The Mini-Z Inventory consists of 10 multiple-choice questions and 1 open question, which focuses on joyful workplace or Z-score (score ≥ 40 supports there is a joyful place of work), supportive work environment (score ≥ 20 indicates there is a highly supportive practice) and workplace EMR stress (score ≥ 20 indicates there is a workplace with reasonable pace and manageable EMR stress).

The Mini-Z 2.0 is a new and easier tool to assess burnout syndrome, actually validated only in English. It was translated into Italian by reverse translation. Cronbach's Alpha coefficient, a statistical index, was used to assess its reliability (range between 0.7 and 0.8 was examined).

The last phase of the study compared the Mini-Z, the CBI and the MBI, via Pearson's coefficient, to highlight the ability of the Mini-Z to be used for burnout assessment. The Pearson correlation coefficient is a statistical index that expresses any linearity relationship between two variables, with values that can range from 1 to -1 (1: perfect positive linear correlation; -1: negative linear correlation; 0: no linear correlation). Moreover, a confirmatory factor analysis was carried out to indicate if the bifactorial structure of the tool is present also in the Italian sample. For this purpose, we used the test of Sphericity and the Kaiser-Meyer-Olkin (KMO) measure for sampling adequacy (it should be greater than 0.70).

Thus, the following cross-sectional study aims to develop an Italian version of the Mini-Z test and to evaluate its validity and reliability, comparing to the MBI and the CBI.

Results

DESCRIPTION OF THE TEST SAMPLE

In the following study, the first step was the characterisation of the sample (table 1) and the analysis of the data from the Mini-Z Inventory administered via links to healthcare professionals. The sample under analysis consists of 120 health professionals, 60.8% of whom are male and 39.2% female. The age of the population varies between 18 and 60 years and over, with a prevalence of 26.8% among professionals aged

Table 1. Characterization of the sample under analysis.

Sample data	Frequency N (%)
Gender	
Male	73 (60.80%)
Female	47 (39.20%)
>60 years	
18-24	9 (7.50%)
25-30	32 (26.70%)
31-40	25 (20.80%)
41-50	19 (15.80%)
51-60	23 (19.20%)
Civil status	
Married	37 (30.80%)
Cohabitant	42 (35.00%)
Separated/Divorced	9 (7.50%)
Single	32 (26.70%)
Variable	
Yes	63 (52.50%)
No	57 (47.50%)
Profession	
Other health professional	7 (5.80%)
Physiotherapist	1 (0.80%)
Nurse	56 (46.70%)
Physician/Dentist	47 (39.20%)
Social and health worker	5 (4.20%)
Technician	4 (3.30%)
Surgery	26 (21.70%)
Emergency	17 (14.20%)
Clinic	30 (25%)
Services	26 (21.70%)
Intensive Care	21 (17.50%)
Job seniority	
<5	45 (37.50%)
>20	38 (31.70%)
11-20	18 (15%)
5-10	19 (15.80%)
Region	
Center	107 (89.20%)
North	3 (2.50%)
South	10 (8.30%)
Distance between home and work	
<5 km	29 (24.20%)
>50 km	10 (8.30%)
11-50 km	38 (31.70%)
5-10 km	43 (35.80%)

between 25 and 38 years. Other socio-demographic and occupational information requested from the subjects, in addition to gender and age, was:

- marital status;
- parenting;
- profession;
- type of department;
- work seniority;
- distance between place of work and home;
- area of residence.

The analysis of the scores showed that 35% of the workers cohabit with their partners, 37 out of 120 are married, 26.7% are single and only 7.5% are divorced. More than half of the population under analysis, 52.5%, have children. The test reached a sample consisting mostly of nurses (46.7%), doctors and dentists (39.2%); the remaining portion was characterised by the presence of: social workers (4.2%), physiotherapists (0.8%), technicians (3.3%) and other professionals (5.8%). The departments concerned were the surgical ward for 21.7%, the medical ward for 25%, the emergency ward for 14.2%, the intensive care ward for 17.5%, and finally the services ward with a valid percentage of 21.7%.

Moreover, we asked participants the length of time they had been working, i.e. how long the subjects had been in employment. What emerged was that 37.5% of the sample had been working for less than five years, 31.7% for more than 20 years, 15% for 11-20 years and 15.8% for 5-10 years.

The area of residence and the distance between the workplace and one's home were also important for the characterisation of the population. 89.2% of the sample live in the centre and 35.8% of the population travels between 5 and 10 km to get to their place of work, while 28.3% travel more than 50 km to get to their company. The description of the sample is important because, as mentioned above, Burnout syndrome arises due to organisational factors but also due to individual factors such as age, gender and job.

BURNOUT ASSESSMENT USING THE MINI-Z INVENTORY

The Mini-Z Inventory, consisting of 10 multiple-choice questions and one open-ended question, aims to assess three points:

- joyful workspace or Z-score;
- supportive work environment;
- non-stressful EMR-related work environment (workplace EMR stress).

The first focus is the assessment of a joyful working environment. To be such, the sum of all items (1 to 10), within a range from 10 to 50, must be greater than or equal to 40. The analysis of the results (figure 1) showed that 18.3 % of the surveyed health care

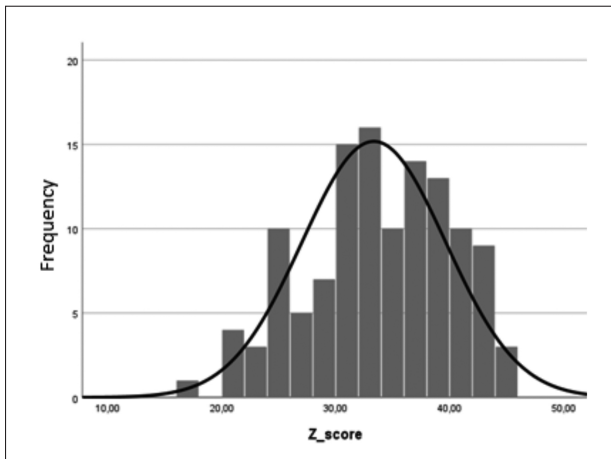


Figure 1. Evaluation of the Joyful Workplace of the Mini-Z.

workers scored equal (2.5%) or higher (15.8%) than 40. The average percentage value was 33.35%, with a standard deviation of 6.3%. This, therefore, emphasises that this portion of employees is more or less satisfied with their working environment. The remaining portion of employees, on the other hand, 81.7%, scored below 40, emphasising an unpleasant working environment with little joy.

The second point focuses on the assessment of a work environment characterised by strong support for and among employees. For this analysis, only items 1 to 4 are taken into account, with a range between 4 and 25. If the sum of the answers is greater than or equal to 20, then this subscale will be fulfilled and the assessment will be positive.

It emerged, however, that the final sum of the scores did not exceed 20, thus underlining the presence of a negative working environment, character-

ised by the absence of support towards the operators and among the colleagues themselves. The totality of the scores results in a maximum score of 19, with a high percentage (17.5%) found on score 16. The average percentage value that emerged was 13.53%, with a standard deviation of 3.3% (figure 2).

The last point assessed, is the analysis of stress related not only to the working environment, but also to the EMR medical record (management, compilation etc.). Here again, only certain items are analysed, namely those from 5 to 8, with an expected score in a range between 4 and 25. If the sum of the scores exceeds or equals 20, then the work environment can be defined and identified by a reasonable work pace with manageable EMR-related stress.

The data emphasise that even in this case, the job is far from being in keeping with the expectations. In fact, 16.7% of the survey population achieved a score of 14, and together with the remaining portion, did not exceed the score of 20, which is necessary for a positive assessment. Only 0.8% (one operator out of 120) achieved a score of 19. The average percentage value is 13%, with a standard deviation of 2.5% (figure 3).

To assess the reliability and trustworthiness of the answers of the Mini-Z test administered to the test population, Cronbach's Alpha coefficient was used. This is a statistical index used to assess the reliability of answers. The range that is examined varies between 0.7 and 0.8. Our study yielded a Cronbach's alpha of 0.827, thus affirming the reliability of the test. Subsequently, to further confirm the first finding, a further analysis was carried out by eliminating one random item from the 10 under analysis. In this case too, Cronbach's Alpha returned a result of 0.79. It emerges, therefore, that the questionnaire is replicable and reliable.

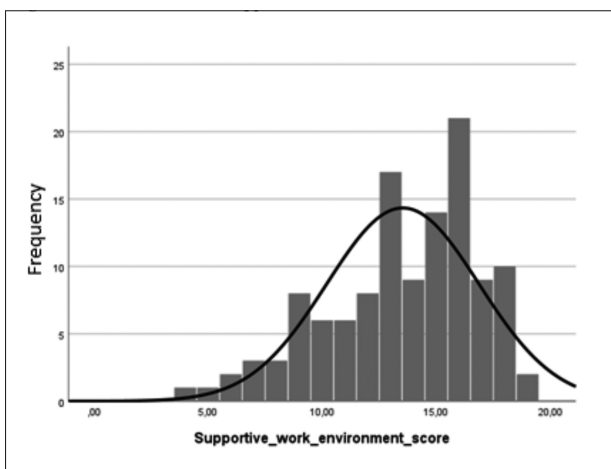


Figure 2. Evaluation of the Supportive Work Environment of the Mini-Z.

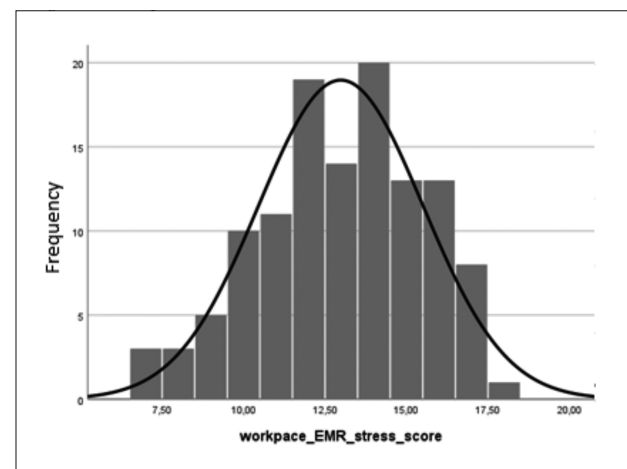


Figure 3. Workplace EMR stress assessment of the Mini-Z.

BURNOUT ASSESSMENT USING THE CBI

It should be noted that the CBI consists of 19 items and is designed to assess three sub-scales of the syndrome:

- Personal Burnout;
- Work Burnout;
- User-related burnout (client burnout).

The evaluation of the first focus reported a mean percentage value of 46.98% with a standard deviation of 21.7%. For the analysis, only the questions concerning the subjects' physical appearance, psychological tiredness and general exhaustion were examined. The highest frequency was found on a result of 20.83% (figure 4).

The evaluation of the second item found an average percentage value of 49.38% and here too, only seven items concerning physical exertion and psychological fatigue experienced by the respondents due to the work activity were considered for the

analysis. The standard deviation is 12.3%. The highest frequency was in this case found on a score of 50% (figure 5).

Finally, the evaluation of the last subscale reported a mean percentage value of 30.90% with a standard deviation of 19.5%. This result derives from the evaluation of six items including psychophysical fatigue resulting from contact with users. The highest frequency is found on a result of 20.83% (figure 6).

BURNOUT ASSESSMENT USING THE MBI

The last burnout assessment performed was conducted through the use of the 22-item MBI.

The test provides scores on three dimensions:

- depersonalisation and/or cynicism;
- emotional exhaustion (EE);
- lack of personal fulfilment.

The evaluation of the first dimension obtained an average percentage value of 7.76% with a standard

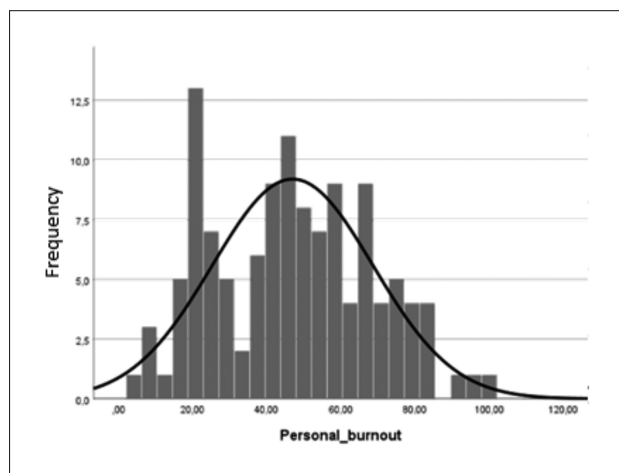


Figure 4. CBI Personal Burnout Assessment.

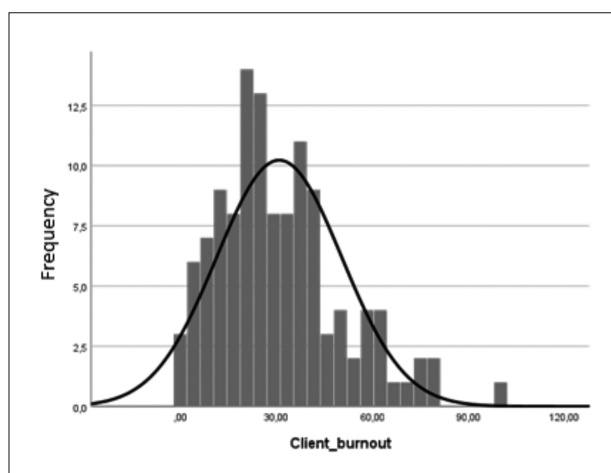


Figure 6. CBI Client Burnout Assessment.

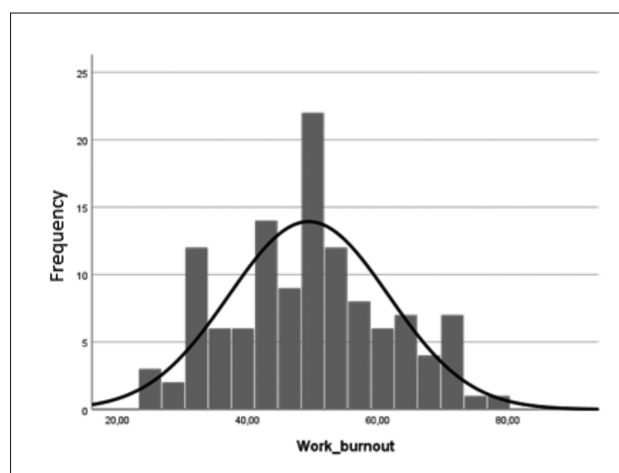


Figure 5. CBI Work Burnout Assessment.

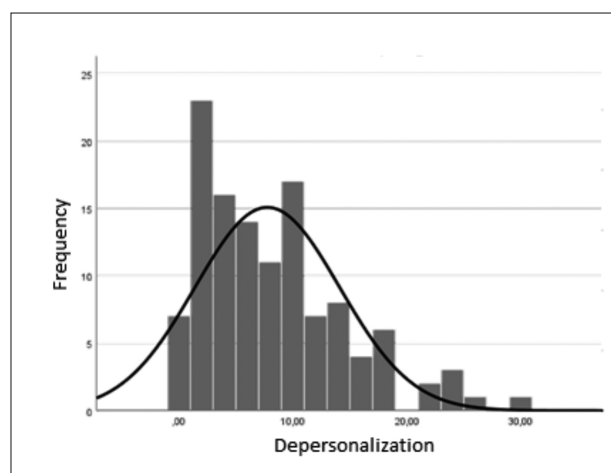


Figure 7. Assessment of Depersonalisation in MBI.

deviation of 6.3%. This result illustrates the presence of cynicism at moderate levels (result between 6-11) in the test population (figure 7).

The evaluation of the second dimension obtained a percentage value of 22.8% with a standard deviation of 12.3%. The values obtained underline moderate emotional exhaustion among the operators (figure 8).

Finally, the evaluation of the lack of personal fulfilment obtained an average percentage value of 37.53% with a standard deviation of 8.3%. This result underlines average values of lack of personal fulfilment and gratification, being lower than the reference values (figure 9).

VALIDITY AND RELIABILITY OF THE MINI-Z

The last phase of the study was characterised by the comparison of the Mini-Z, the CBI and the MBI (table 2).

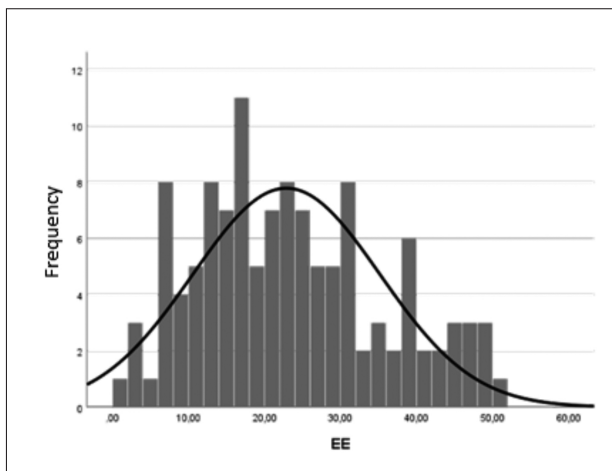


Figure 8. Assessment of Emotional Exhaustion in MBI.

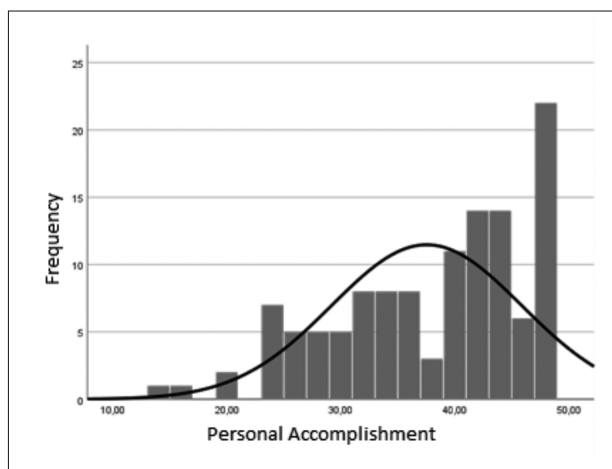


Figure 9. Assessment of Personal Achievement in MBI.

To carry out this step, the Pearson correlation coefficient was used, a statistical index expressing a possible linearity relationship between two variables, and is between 1 and -1. A score of 1 corresponds to a perfect positive linear correlation, while a score of -1 corresponds to a negative linear correlation. A score of 0 corresponds to no linear correlation.

The comparison was made by taking the different dimensions of the above-mentioned tests analysed. Going into the details of the analysis, the correlation between the Z-score of the Mini-Z, of -0.697 ($p < 0.001$), with the Personal Burnout of the CBI is highlighted. The same analysis takes place for the Joyful Workplace and the Supportive Work Environment, which are correlated with the aforementioned dimension of the CBI by a coefficient of -0.441 ($p < 0.001$), for the former, and -0.635 ($p < 0.001$) for the latter. We note a negative linear correlation. This is because the dimensions under consideration assess absolutely mirror aspects.

The correlation between Work Burnout and the Mini-Z-score dimensions are linearly correlated. Pearson's coefficient is -0.588 ($p < 0.001$) for the correlation between Work Burnout and the Z-score, a coefficient of -0.410 ($p < 0.001$) between Work Burnout and the Joyful Workplace and finally a value of -0.530 ($p < 0.001$) between Work Burnout and the Supportive Work Environment.

Finally, the analysis points out that the last dimension of the CBI under analysis also presents a negative linear correlation with the three sub-scales of the Mini-Z. Between Client Burnout and the Z-Score the correlation is -0.467 ($p < 0.001$), the coefficient between Client Burnout and the Joyful Workplace is -0.227 ($p = 0.013$) and finally the value between Client Burnout and the Supportive Work Environment is -0.426 ($p < 0.001$). The subsequent correlation analysis was carried out with the dimensions treated by the Maslach Burnout Inventory.

For the Personal Accomplishment dimension, the correlation coefficient with the Z-Score is 0.599 ($p < 0.001$). This index emphasizes a positive linear correlation, unlike the relationships discussed above. This is possible because the dimensions under consideration can both be considered positive, i.e. dealing with physical or psychological conditions of the subject that are not adverse or negative. The second dimension analysed is Depersonalisation, or cynicism, which correlated with the Z-Score of the Mini-Z shows a coefficient of -0.555. The same dimension of the MBI was correlated with the Joyful Workplace with a resulting coefficient of -0.278 ($p = 0.002$). The last correlation was made with the dimension called Stress Workplace Score with a coefficient of -0.514 ($p < 0.001$).

Moreover, the last dimension addressed is Emotional Exhaustion. The Pearson correlations obtained

Correlations		Z_score	Joyful workplace	Supportive work environment score	Workplace EMR stress score	Personal burnout	Work burnout	Client burnout	Personal accomplishment	Depersonalisation	EE
Z_score	Pearson's correlation	1	.646**	.902**	.880**	-.697**	-.588**	-.467**	.599**	-.555**	-.736**
	Two-sided significance		<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001
Joyful workplace	Pearson's correlation	.646**	1	.539**	.603**	-.441**	-.410**	-.227*	.343**	-.278**	-.461**
	Two-sided significance	<.001		<.001	<.001	<.001	<.001	0.013	<.001	0.002	<.001
Supportive work environment score	Pearson's correlation	.902**	.539**	1	.635**	-.635**	-.530**	-.426**	-.567**	-.514**	-.674**
	Two-sided significance	<.001	<.001		<.001	<.001	<.001	<.001	<.001	<.001	<.001
Workpace EMR stress score	Pearson's correlation	.880**	.603**	.635**	1	-.598**	-.489**	-.384**	.506**	-.494**	-.634**
	Two-sided significance	<.001	<.001	<.001		<.001	<.001	<.001	<.001	<.001	<.001
Personal burnout	Pearson's correlation	-.697**	-.441**	-.635**	-.598**	1	.806**	.549**	-.530**	.548**	.783**
	Two-sided significance	<.001	<.001	<.001	<.001		<.001	<.001	<.001	<.001	<.001
Work burnout	Pearson's correlation	-.588**	-.410**	-.530**	-.489**	.806**	1	.529**	-.335**	.489**	.753**
	Two-sided significance	<.001	<.001	<.001	<.001	<.001		<.001	<.001	<.001	<.001
Client burnout	Pearson's correlation	-.467**	-.227*	-.426**	-.384**	.549**	.529**	1	-.377**	.681**	.628**
	Two-sided significance	<.001	0.013	<.001	<.001	<.001	<.001		<.001	<.001	<.001
Personal accomplishment	Pearson's correlation	.599**	.343**	.567**	.506**	-.530**	-.335**	-.377**	1	-.461**	-.495**
	Two-sided significance	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001
Depersonalisation	Pearson's correlation	-.555**	-.278**	-.514**	-.494**	.548**	.489**	.681**	-.461**	1	.676**
	Two-sided significance	<.001	0.002	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001
EE	Pearson's correlation	-.736**	-.461**	-.674**	-.634**	.783**	.753**	.628**	-.495**	.676**	1
	Two-sided significance	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001

* Two-sided significant correlation at 0,05.

** Two-sided significant correlation at 0,01.

are: -0.736 ($p < 0.001$) for the Z-Score, -0.461 ($p < 0.001$) for Joyful Workplace and -0.674 ($p < 0.001$) for Supportive Work Environment. In order to carry out a more detailed and precise analysis, correlations were also carried out by changing the order of the dimension. The result remains the same.

Finally, for the factor analysis (Annex 1), the KMO is equal 0.838 indicating a good sampling, and the test of Sphericity gave a $p < 0.001$, indicating that the condition of Factor analysis is satisfied. Two factors have eigenvalues (a measure of explained variance) greater than 1, which is a common criterion for factor to be useful. The factor analysis suggests that there are two factors extracted from all variables explaining about 59.62% variance on the total variance, in a very similar way of the bifactorial structure of the original tool:

- Factor 1: Z1, Z3, Z10, Z5, Z6, Z4;
- Factor 2: Z4, Z2, Z7, Z9, Z8.

Discussion and conclusions

Burnout is very common among workers and especially among healthcare workers and a routine assessment seems to be necessary to be able to prevent the syndrome⁶. The MBI and the CBI are identified as standard questionnaires for the evaluation of Burnout but have the limitation of being too long. The Italian version of the Mini-Z includes ten items and is more user-friendly and aims to assess not only Burnout subscales, as in previous tests, but also well-being factors and has applied a rigorous approach, including forward translation, back translation and cognitive debriefing⁷.

The aim of this study was to evaluate the Italian version of the Mini-Z, comparing it with the other most used scales as CBI and MBI. As already known, Burnout syndrome could depend, besides organizational factors, also on individual factors, such as age, gender and job as stated also in literature in West study where higher rates of burnout were reported in female and younger physicians⁸ and also other studies, in general population, confirmed that younger age was correlated with a higher risk of Burnout. On the other hand, several other studies found non uniform results about gender as prediction of Burnout: some studies found higher levels of Burnout in women, others found higher levels in men⁹ and still others found no difference. Higher levels of education, though, have been correlated with higher levels of Burnout, but the correlation is not yet clear¹⁰. Other studies on Burnout were based on the same methodology using Pearson's correlation coefficient to analyze the data and to find out the correlation between Burnout and Flexibility, Work-satisfaction and Resilience¹¹⁻¹³. The limitations of this study are to be found in the limited sample under examination, in the typical methodology of the ques-

tionnaire (a subjective instrument where anyone can report false experiences) and, of course, in the cross-sectional nature of the study, which allows us to see general associations but not to assess the cause-effect relationship between different variables.

The Mini-Z 2.0 is a newly designed simple survey and has been recognised as a powerful tool to assess Burnout and stress factors in the workplace^{14,15}. The Italian version was translated using the reverse translation method. In this study, we evaluated the validity and reliability of the Italian version of the Mini-Z 2.0 which may play an important role in the future in the assessment of well-being and Burnout.

With regard to the validity of the questionnaire, comparisons were made by means of Pearson's coefficient, underlining its appropriateness. In fact, the coefficients (positive or negative linear) all presented a value very close to -1 or 1, underlining a more than adequate correspondence. For the reliability of the Mini-Z, Cronbach's alpha was used, resulting in a correct match. Moreover, we want to underline that the goal of the study was to create an Italian version of the tool and not to compare with the clinical situation of the participants, and that construct validity was inferred from other psychometric tests, used as references, and we performed a parallel form reliability.

The analysis of the data revealed the presence of the Burnout syndrome among the 120 surveyed HCWs using the three Inventories. Assessing the Burnout, considering only the use of the Mini-Z, it emerged that the final sum of the scores under analysis does not exceed a total of 20, confirming the presence of a negative working environment, characterised by the absence of support towards the operators and among the colleagues themselves. All this leads, therefore, to the development of Burnout.

Conflicts of interests: the authors have no conflict of interests to declare.

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