

ORIGINAL PAPER ΕΡΕΥΝΗΤΙΚΗ ΕΡΓΑΣΙΑ

The single item burnout measure is a reliable and valid tool to measure occupational burnout

OBJECTIVE To estimate the reliability and the validity of the single item burnout measure in a sample of nurses in Greece. **METHOD** An online cross-sectional study in Greece with 963 nurses was conducted. Data was collected during October 2022. Demographic and work-related variables of nurses, i.e. gender, age, chronic disease, self-rated health status, years of experience, and working in COVID-19 ward/intensive care unit were measured. The single item burnout (SIB) and the Copenhagen Burnout Inventory (CBI) to measure occupational burnout were used. Moreover, the COVID-19 Burnout Scale (COVID-19-BS) to measure nurses' burnout during the pandemic, and the Patient Health Questionnaire-4 (PHQ-4) to measure anxiety and depression among nurses were used. **RESULTS** Intraclass correlation coefficient between the two measurements of the SIB during the test-retest study was 0.986 indicating excellent reliability of the SIB. A high correlation between CBI and SIB ($p < 0.001$), a moderate correlation between PHQ-4 and SIB ($p < 0.001$), and a low to moderate correlation between COVID-19-BS and SIB ($p < 0.001$) was found. Therefore, concurrent validity of SIB was excellent. Moreover, SIB had high discriminant validity. In particular, nurses with a chronic disease, those with a very poor/poor/moderate health status, and those working in COVID-19 ward/intensive care units had higher levels of burnout according to the SIB ($p < 0.001$ in all cases). Moreover, a positive relationship between years of experience and SIB score ($r = 0.13$, $p < 0.001$) was found. **CONCLUSIONS** The single item burnout measure is a brief, reliable, and valid tool that can be used as a screening measure to identify individuals at high risk of burnout.

The World Health Organization (WHO) defines occupational burnout as an occupational phenomenon caused by chronic stress due to work or the workplace.¹ Occupational burnout is not considered as a medical condition and oc-

curs when individuals cannot manage their chronic stress effectively. Burnout is mainly characterized by exhaustion, cynicism, and inefficacy.² In particular, people that suffer from burnout are also emotionally exhausted, show

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ΑΡΧΕΙΑ ΕΛΛΗΝΙΚΗΣ ΙΑΤΡΙΚΗΣ 2024, 41(2):245–250

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Περίληψη στο τέλος του άρθρου

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increased levels of depersonalisation and cynicism, and feel a reduced personal accomplishment.³

Burnout is prevalent in a variety of jobs. In particular, the pooled prevalence of burnout is 43.2% in physicians,⁴ in nurses is 11.2%,⁵ in pharmacists is 51%,⁶ in general practitioners is 37%,⁷ in dentists is 13%,⁸ in psychiatrists is 25.9%,⁹ and in primary healthcare professionals is 28.1%.¹⁰ We should notice that there are significant differences in prevalence of burnout between geographical regions, clinical settings and specialties. COVID-19 pandemic has had a tremendous impact on physical and mental health of healthcare workers increasing their burnout.^{11–13} High levels of burnout among healthcare workers is an occupational hazard since burnout is related with decreased healthcare workers productivity and patients satisfaction, and worsening quality of care and safety.^{14,15}

Several questionnaires, tools, and scales are available for measuring burnout, such as the Maslach Burnout Inventory, the Oldenburg Burnout Inventory, the Copenhagen Burnout Inventory, the Shirom-Melamed Burnout Measure, and the Burnout Clinical Subtype Questionnaire.¹⁶ Among these tools, the Maslach Burnout Inventory and the Copenhagen Burnout Inventory are the most widely used tools in healthcare research to measure burnout. The main disadvantage of these tools is that they consist of many items causing participants' tiredness and low response rates. Thus, a single item burnout measure is created in order to measure occupational burnout quickly and valid.¹⁷ The aim of our study was to estimate the reliability and the validity of the single item burnout measure in a sample of nurses in Greece.

MATERIAL AND METHOD

Study design

We conducted an online cross-sectional study in Greece with 963 nurses. Data was collected during October 2022. We created an online version of the study questionnaire and we disseminated it through social media. Thus, a convenience sample with unknown response rate was obtained. We applied the following inclusion criteria: (a) Adult participants, (b) working as nurses, (c) participants who understand the Greek language. Prior to the final study, we conducted a pilot study with 50 nurses in order to perform the test-retest method. In that case, nurses completed the questionnaire two times with an interval of one week. Moreover, we performed cognitive interviews with ten nurses in order to assess the face validity of the questionnaire. Face validity was excellent since all nurses understand and complete the study questionnaire.

We collected our data on an anonymous and voluntary basis. Moreover, we informed participants about the aim and the design

of the study and they gave their informed consent. In addition, our study protocol was approved by the Ethics Committee of Faculty of Nursing, National and Kapodistrian University of Athens (ref.-no: 417, 7.9.2022). Also, we followed the guidelines of the Declaration of Helsinki in order to conduct our study.

Measurements

We measured demographic and work-related variables of nurses, i.e. gender (females or males), age (continuous variable), chronic disease (no or yes), self-rated health status (scale from 1 [very poor] to 5 [very good]), years of experience (continuous variable), and working in COVID-19 ward/intensive care unit (no or yes).

We used the single item burnout (SIB) to measure occupational burnout.¹⁷ In that case, we asked nurses to rate their current level of burnout. In particular, the question was the following: "On a scale from 0 (not at all) to 10 (totally), how tired do you feel?".

Moreover, we used the Copenhagen Burnout Inventory (CBI) to measure occupational burnout.¹⁸ The CBI consists of 19 items creating three factors: personal burnout, work-related burnout, and client-related burnout. Score on the three factors ranges from zero (not at all burnout) to 100 (extreme burnout). We used the Greek version of the CBI which is proven to be reliable and valid.¹⁹

Also, we used the COVID-19 burnout scale (COVID-19-BS) to measure nurses' burnout since we performed our study three years after the onset of the COVID-19 pandemic and COVID-19 burnout among nurses was possible.²⁰ The COVID-19-BS includes 13 items creating three factors: emotional exhaustion, physical exhaustion, and exhaustion due to measures against the COVID-19. Score on the three factors ranges from one (not at all burnout) to five (extreme burnout). We used the reliable and valid Greek version of the COVID-19-BS.^{20,21}

We used the Patient Health Questionnaire-4 (PHQ-4) to measure anxiety and depression among nurses.²² Two items measure the anxiety and two items measure the depression creating a score from 0 (normal levels) to 6 (severe symptomatology). Greek version of the PHQ-4 seems to be reliable and valid.²³

Statistical analysis

We used numbers and percentages to present categorical variables, and means and standard deviations to present continuous variables. We calculated the intraclass correlation coefficient between the two measurements of the SIB during the test-retest study. We calculated Pearson's correlation coefficient between the SIB and CBI, COVID-19-BS, and PHQ-4 in order to estimate the concurrent validity of the SIB. Also, we conducted known-group analysis by performing the following: (a) Independent samples t-test for gender, chronic disease, health status, and working in COVID-19 ward/intensive care unit, (b) Pearson's correlation coefficient for age, and (c) Spearman's correlation coefficient for years of experience. As statistically significant were considered p-values less than 0.05. We used the Statistical Package for Social

Sciences (SPSS), version 21.0 (IBM Corporation released 2012; IBM Corporation Armonk, NY) for the analysis.

RESULTS

Study population included 963 nurses. Most of the nurses were females (88.4%) in good/very good health. Mean age was 37.9 years, while mean years of experience was 12. One out of four nurses (25%) reported a chronic disease, while 64.1% working in COVID-19 ward/intensive care unit. Detailed demographic and work-related data of nurses are presented in table 1.

Intraclass correlation coefficient between the two measurements of the SIB during the test-retest study was 0.986 (95% confidence interval [CI]: 0.976 to 0.992, $p < 0.001$) indicating excellent reliability of the SIB.

Correlations between SIB and the other scales are presented in table 2. All correlations were statistically significant ($p < 0.001$ in all cases) and therefore concurrent validity of the SIB was excellent. In particular, we found a high correlation between CBI factors and the SIB, a moderate correlation between the PHQ-4 and the SIB, and a low to moderate correlation between the COVID-19-BS and the SIB.

Results from known-groups analysis are presented in table 3. SIB had high discriminant validity. In particular, nurses with a chronic disease, those with a very poor/poor/moderate health status, and those working in COVID-19

Table 1. Demographic and work-related data of nurses.

Variables	n	%
<i>Gender</i>		
Males	112	11.6
Females	851	88.4
Age (years)*	37.9	9.6
<i>Chronic disease</i>		
No	722	75.0
Yes	241	25.0
<i>Self-perceived health status</i>		
Very poor/poor/moderate	112	11.6
Good/very good	851	88.4
<i>Working in COVID-19 ward/intensive care unit</i>		
No	346	35.9
Yes	617	64.1
Years of experience*	12.0	9.2

*Mean, standard deviation

Table 2. Correlations between the single item burnout measure and the Copenhagen Burnout Inventory, the COVID-19 burnout scale, and the Patient Health Questionnaire-4.

Scale	Single item burnout	
	Correlation coefficient	p-value
<i>Copenhagen Burnout Inventory</i>		
Personal burnout	0.82	<0.001
Work-related burnout	0.72	<0.001
Client-related burnout	0.79	<0.001
<i>COVID-19 burnout scale</i>		
Emotional exhaustion	0.45	<0.001
Physical exhaustion	0.53	<0.001
Exhaustion due to measures against the COVID-19	0.21	<0.001
<i>Patient Health Questionnaire-4</i>		
Anxiety	0.42	<0.001
Depression	0.46	<0.001

ward/intensive care units had higher levels of burnout according to the SIB ($p < 0.001$ in all cases). Moreover, we found a positive relationship between years of experience and SIB score ($r = 0.13$, $p < 0.001$).

Table 3. Known-groups analysis between the single item burnout measure and demographic and work-related data of nurses.

Variables	Single item burnout measure		p-value
	Mean	Standard deviation	
<i>Gender</i>			0.48*
Males	6.32	2.57	
Females	6.51	2.58	
<i>Age (years)</i>		0.05**	0.14**
<i>Chronic disease</i>			
No	6.24	2.62	
Yes	7.20	2.31	
<i>Self-perceived health status</i>			
Very poor/poor/moderate	6.76	2.44	
Good/very good	5.79	2.78	
<i>Working in COVID-19 ward/intensive care unit</i>			
No	6.02	2.55	
Yes	6.75	2.56	
<i>Years of experience</i>		0.13***	<0.001***

* Independent samples t-test, ** Pearson's correlation coefficient, *** Spearman's correlation coefficient

DISCUSSION

We conducted a cross-sectional study to assess the psychometric properties of the single item burnout measure. We found that the single item burnout measure is a reliable and valid tool that we can use to measure occupational burnout easily and quickly.

A brief and sensitive tool such as SIB is imperative to identify worker burnout since this occupational phenomenon is related with physical and mental health, and turnover intention. Our results support the hypothesis that SIB can fulfill this gap due to its reliability, validity, ease of administration, and brevity. First, we found that the SIB had excellent reliability in our pilot study performing the test-retest method. Moreover, concurrent validity and known-groups analysis confirmed the high level of validity of SIB. We used three other scales (i.e., CBI, PHQ-4, COVID-19-BS) to measure concurrent validity of the SIB and six demographic and work-related data of nurses to measure discriminant validity.

Our findings were confirmed by several other studies that estimate the psychometric properties of the SIB.^{24–26} These studies used the Maslach Burnout Inventory as a gold standard to compare the SIB, while the study populations included general practitioners and primary care staff. Scholars found that SIB is a sensitive and specific tool to identify workers at high or low levels of burnout with a high degree of accuracy.

Literature supports our results from the known-groups

analysis. In particular, a recent systematic review confirms that healthcare professionals working with COVID-19 patients are more likely to experience burnout, stress, and depression.²⁷ Moreover, we found that nurses with a very poor/poor/moderate health status and those with a chronic disease experienced higher levels of burnout. This finding is suggested from previous research where healthcare workers suffered from several diseases such as depression, anxiety, stress.^{28–30}

Our study had several limitations. First, we assessed the reliability and validity of the SIB using different methods and tools. However, other analyses such as sensitivity and specificity analysis could be performed in order to get more valid results. Also, other tools such as Maslach Burnout Inventory could be used as gold standard in order to compare the SIB with them. Moreover, we used a big sample of nurses but further studies with different professionals (e.g. physicians, workers in primary care services, dentists, etc.) should be conducted in order to expand our results. Additionally, we performed known-groups analysis using six demographic and work-related data of nurses. Future research could use more demographic and work-related variables in order to investigate the discriminant validity of the SIB.

In conclusion, the single item burnout measure is a reliable and valid tool that we can use to measure occupational burnout. Since burnout among healthcare workers is highly prevalent, tools like the SIB could be used as sensitive and brief screening measures to identify individuals at high risk of burnout.

ΠΕΡΙΛΗΨΗ

Μία ερώτηση για την εκτίμηση της εξουθένωσης είναι ένα αξιόπιστο και έγκυρο εργαλείο για τη μέτρηση της επαγγελματικής εξουθένωσης

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ΣΚΟΠΟΣ Η εκτίμηση της αξιοπιστίας και της εγκυρότητας μίας μόνο ερώτησης για τη μέτρηση της εξουθένωσης σε ένα δείγμα νοσηλευτών στην Ελλάδα. **ΥΛΙΚΟ-ΜΕΘΟΔΟΣ** Διεξήχθη διαδικτυακά μια συγχρονική μελέτη με 963 νοσηλευτές στην Ελλάδα. Η συλλογή των δεδομένων πραγματοποιήθηκε τον Οκτώβριο του 2022. Μετρήθηκαν δημογραφικά και επαγγελματικά χαρακτηριστικά των νοσηλευτών, όπως το φύλο, η ηλικία, η ύπαρξη χρόνιου νοσήματος, η κατάσταση της υγείας, τα έτη προϋπηρεσίας και η εργασία σε κλινική/μονάδα εντατικής θεραπείας (ΜΕΘ)

για ασθενείς με COVID-19. Για τη μέτρηση της επαγγελματικής εξουθένωσης χρησιμοποιήσαμε μια ερώτηση για την εκτίμηση της εξουθένωσης (single item burnout, SIB) και το ερωτηματολόγιο Copenhagen Burnout Inventory (CBI). Επί πλέον, χρησιμοποιήσαμε την κλίμακα COVID-19 burnout scale (COVID-19-BS) για να μετρήσουμε την εξουθένωση των νοσηλευτών κατά τη διάρκεια της πανδημίας και το ερωτηματολόγιο Patient Health Questionnaire-4 (PHQ-4) για τη μέτρηση του άγχους και της κατάθλιψης των νοσηλευτών. **ΑΠΟΤΕΛΕΣΜΑΤΑ** Ο συντελεστής ενδοταξικής συσχέτισης μεταξύ των δύο μετρήσεων του SIB στη μελέτη ελέγχου-επανελέγχου ήταν 0,986, γεγονός που δηλώνει εξαιρετική αξιοπιστία του SIB. Βρέθηκε υψηλή συσχέτιση ανάμεσα στο CBI και στο SIB ($p < 0,001$), μέτρια συσχέτιση ανάμεσα στο PHQ-4 και στο SIB ($p < 0,001$) και μικρή έως μέτρια συσχέτιση ανάμεσα στο COVID-19-BS και στο SIB ($p < 0,001$). Επομένως, η συγκλίνουσα εγκυρότητα του SIB ήταν εξαιρετική. Επί πλέον, βρέθηκε ότι το SIB είχε υψηλή διακριτική ικανότητα. Πιο συγκεκριμένα, οι νοσηλευτές που έπασχαν από κάποιο χρόνιο νόσημα, οι νοσηλευτές με πολύ κακή/κακή/μέτρια κατάσταση υγείας και οι νοσηλευτές οι οποίοι εργαζόνταν σε κλινική/ΜΕΘ για ασθενείς με COVID-19 είχαν υψηλότερα επίπεδα εξουθένωσης σύμφωνα με το SIB ($p < 0,001$ σε όλες τις περιπτώσεις). Επί πλέον, βρέθηκε θετική συσχέτιση ανάμεσα στα έτη προϋπηρεσίας και στη βαθμολογία στο SIB (συντελεστής συσχέτισης=0,13, $p < 0,001$). **ΣΥΜΠΕΡΑΣΜΑΤΑ** Το SIB είναι ένα σύντομο, αξιόπιστο και έγκυρο εργαλείο που θα μπορούσε να χρησιμοποιηθεί σε προσυμπτωματικό επίπεδο για την αναγνώριση των ατόμων που βρίσκονται σε υψηλό κίνδυνο να εμφανίσουν εξουθένωση.

Λέξεις ευρητηρίου: Εγκυρότητα, Εργασία, Ερώτηση μέτρησης της εξουθένωσης, COVID-19 burnout scale, Copenhagen Burnout Inventory, Patient Health Questionnaire-4

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