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The Polish adaptation of the Burnout Assessment Tool (BAT-PL) by Schaufeli et al.

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Summary

Aim. The study aimed to present the Polish version of the Burnout Assessment Tool (BAT-PL) by Schaufeli et al. and to assess its validity and reliability. The tool measures the *core* symptoms of burnout (BAT-C): exhaustion, mental distance, cognitive and emotional impairment, and its *secondary* symptoms (BAT-S): psychosomatic complaints and psychological distress.

Method. The participants were 255 nursing staff members. The construct validity was assessed with a one-point job satisfaction scale, the Utrecht Work Engagement Scale (UWES-3) by Schaufeli et al. and the Job-related Affective Well-being Scale (JAWS) by van Katwyk et al.

Results. The results of the confirmatory factor analysis supported an assumed bi-factor structure. This applies to both BAT-C as the four core symptoms and a general factor representing burnout and BAT-S as a set of two secondary symptoms and a general factor. Both scales were strongly correlated with one another and differed from other measures of job-related well-being (job satisfaction, work engagement and negative emotions). The values of Cronbach's alpha and composite reliability indicated BAT-PL as a reliable measurement tool.

Conclusions. BAT-PL by Schaufeli et al. has good psychometric characteristics to be used in research on burnout and further validated in clinical practice.

Key words: burnout assessment tool, validation, occupational health

Introduction

Burnout syndrome is a central indicator of the work-related health deterioration process [1]. This phenomenon is particularly common in the healthcare sector, for which it is estimated that, depending on the profession, the percentage of burned-out

workers ranges between 35-80% [2-4]. Burnout is a significant predictor of deterioration in physical health (e.g. musculoskeletal complaints, hypercholesterolaemia [5]) and mental health (e.g. sleep disorders, depression [5-7]), and it also encourages unhealthy behaviours [8]. Moreover, burnout contributes to a lower quality of work [9], increasing absenteeism and inability to work [10, 11].

Among the burnout assessment methods [12], the Maslach Burnout Inventory (MBI) [13] is the most popular. However, more than forty years have passed since it was established and, during this time, requirements for employees have changed considerably. The expansion of digitisation has led to extending traditional burnout factors, such as work overload and emotional requirements [14-16], to include cognitive requirements related to information processing [17]. Previous studies have largely ignored those cognitive dysfunctions [18-20]. Moreover, there has been an increase in bureaucratic load and more tasks are perceived as redundant [21]. Thus, it has become a common experience for healthcare employees to be engaged mostly in preparing documentation, reports and statements instead of focussing on medical care [22-24].

In the context of the acceleration of work requirements and their transformation, a new understanding of burnout is needed. Schaufeli et al. [25, p. 29] have therefore defined burnout as "a work-related state of exhaustion that occurs among employees, which is characterized by extreme tiredness, reduced ability to regulate cognitive and emotional processes, and mental distancing. These four core dimensions of burnout are accompanied by depressed mood as well as by non-specific psychological and psychosomatic distress symptoms." The core symptoms of burnout may be accompanied with additional non-specific symptoms. They are usually not taken into account in the assessment until the burnout reaches a clinical level [26, 27]. However, it is the somatoform symptoms, low mood and work-related distress that motivate employees to seek professional help.

In the course of further work, based on the existing burnout tools and interviews with clinical psychologists and psychiatrists [28], a new Burnout Assessment Tool (BAT) was proposed [25]. It covers core symptoms (BAT-C) and secondary symptoms (BAT-S) that may be present, too. BAT-C comprises 23 statements describing four dimensions: exhaustion, cognitive and emotional impairment (inability to work) and mental distance (unwillingness to work). BAT-S, in turn, comprises 10 statements referring to two dimensions: psychosomatic complaints and symptoms of psychological distress constituting secondary symptoms that are different from the set of core symptoms. Each statement has the same format of responses in which 1 means that the respondent never feels this particular way, and 5 means that he/she always feels this particular way. The instructions directly refer to the context of work ("The following statements are related to your work situation and how you experience this situation. Please state how often each statement applies to you"). Therefore, BAT comprises two distinct scales, of which the first one consists of four subscales referring to core symptoms representing burnout, and the second scale consists of two subscales pertaining to secondary symptoms that reflect non-specific symptoms of burnout. The results for each subscale and the overall score for core and secondary

symptoms are calculated by adding responses, and then the dividing the sum by the number of statements.

In addition to its first language versions – Flemish, Dutch and English [25], new language versions have been developed, such as Finnish, Irish, German and Japanese [29]. Previous research has revealed that BAT-C and BAT-S have good psychometric characteristics, including factor validity and internal reliability [12, 29-31].

According to the circular model of job-related well-being [32], the indicators of well-being include positive and negative emotions experienced at work, job satisfaction and work engagement (vigour, work dedication and work absorption). The existing studies confirm the construct validity of BAT-C and BAT-S for work engagement, boredom at work and workaholism [12, 31].

The study is aimed at a preliminary psychometric analysis of the Polish version of the BAT (BAT-PL), including its validity and reliability. Factor validity was verified with confirmatory factor analysis (CFA) based on a maximum likelihood estimation method. Model fit was assessed with the following indices: chi-square (χ^2), the Tucker-Lewis Index (TLI), the Comparative Fit Index (CFI), the Root Mean Square Error of Approximation (RMSEA) and the Standardised Root Mean Squared Residual (SRMR). For satisfactory goodness of fit, TLI and CFI should exceed 0.90 [33], and RMSEA and SRMR should be below 0.08 [34]. Convergent validity was measured with the Average Variance Extracted (AVE), the value of which for each latent variable in the model should exceed 0.50 [35]. Discriminant validity was assessed by examining whether AVE is higher than the squared coefficients of bivariate correlation between the indicators of core and secondary symptoms of burnout, job satisfaction, work engagement and negative affect [35]. Measurement reliability was established using two coefficients: Cronbach's alpha and composite reliability (CR). The minimum acceptable value for both measures is 0.70 [36]. Preliminary norms were developed using the percentile transformation [25].

Method

Participants

The study participants consisted of 252 nursing staff members (5% men), predominantly with higher education (87%), employed on a full-time basis with healthcare facilities (64% with hospitals) throughout Poland. Job tenure ranged between 1 and 43 years (M = 22.3, SD = 11.1). The participants were aged between 23 and 64 (M = 44.7, SD = 10.1; 11% under the age of 30 and 31% above the age of 50), most of them (79%) were in stable relationships, and half of them had dependent children. The measurement was conducted as an online survey in the second quarter of 2019 as part of a larger project on determinants of burnout. The participants were informed about the aim of the study and their rights in line with the Declaration of Helsinki. Written informed consent was obtained from all subjects.

Instruments

The following tools were used for examining construct validity:

1. Job satisfaction was assessed with one item: "*To what extent are you satisfied with your job?*" [37]. In terms of the validity and reliability, the single-item measures do not deviate from the scale measures of overall job satisfaction [38]. Responses were provided on a five-point scale, where 1 = very unsatisfied, and 5 = very satisfied.
2. Work engagement was measured with the ultra-short version of the Utrecht Work Engagement Scale (UWES-3) [39]. The scale comprises three items referring to the components of work engagement, i.e. vigour, work dedication and work absorption. Respondents provide their answers on a five-point scale, where 1 = never, and 5 = always. In this study, Cronbach's alpha was 0.75.
3. Negative emotions in the context of work were assessed using six items from the Job-related Affective Well-being Scale (JAWS) [40]. Respondents stated how often they experienced a particular emotion at work (e.g. angry, discouraged) on a five-point scale, where 1 = never, and 5 = very often. In this study, Cronbach's alpha was 0.88.

The BAT-PL translation

The Polish version of the Burnout Assessment Tool was translated from the English version, then consulted with two psychologists with experience in assessing burnout. Next, it was back-translated into English. Following a comparison of the original and resultant versions, the final questionnaire was established, which was approved as an official Polish translation by the co-author of the BAT (Wilmar Schaufeli). The pilot study was conducted in a group of white-collar workers, resulting in satisfactory psychometric characteristics [41].

Results

Descriptive statistics

The descriptive statistics of the analysed variables are presented in Table 1. The values of skewness and kurtosis indicate that the distribution of variables does not significantly differ from the normal distribution.

Table 1. **Descriptive statistics and correlations between the analysed variables**

Job burnout: core symptoms	M	SD	Min	Max	S	K	EX	MD	CI	EI	BAT-C	PD	PC	BAT-S	UWES	SAT	NA
Exhaustion (EX)	2.91	0.78	1	5	0.05	-0.47	-										
Mental distancing (MD)	2.18	0.75	1	4.6	0.48	0.11	0.68	-									
Cognitive impairment (CI)	1.89	0.62	1	3.8	0.52	0.13	0.47	0.52	-								
Emotional impairment (EI)	2.09	0.69	1	4	0.45	-0.30	0.56	0.57	0.60	-							
Global index: BAT-C	2.35	0.60	1	3.96	0.20	-0.48	0.89	0.84	0.73	0.80	-						
Job burnout: secondary symptoms																	
Psychological distress (PD)	2.68	0.84	1	5	0.25	-0.46	0.70	0.53	0.38	0.57	0.69	-					
Psychosomatic complaints (PC)	2.48	0.77	1	5	0.17	-0.26	0.64	0.50	0.39	0.47	0.64	0.74	-				
Global index: BAT-S	2.58	0.75	1	5	0.17	-0.36	0.72	0.55	0.41	0.56	0.71	0.94	0.93	-			
Well-being indicators																	
Work engagement (UWES)	3.61	0.67	1	5	-0.73	1.14	-0.29	-0.48	-0.35	-0.31	-0.42	-0.30	-0.23	-0.29	-		
Job satisfaction (SAT)	3.78	0.75	1	5	-0.52	0.54	-0.47	-0.55	-0.23	-0.41	-0.52	-0.48	-0.36	-0.45	0.50	-	
Negative affect (NA)	2.95	0.84	1	5	0.10	-0.34	0.70	0.62	0.40	0.58	0.73	0.63	0.55	0.63	-0.33	-0.57	-

Note. *M* – mean; *SD* – standard deviation; *Min* – minimum value; *Max* – maximum value; *S* – skewness; *K* – kurtosis. The format of responses is from 1 to 5. The values of the indicators are the sum of responses divided by the number of items. All correlation coefficients are statistically significant at $p < 0.05$.

The core symptoms of burnout moderately correlated with one another, whereas among the secondary symptoms strong correlations were noted. Similarly, a strong correlation was revealed between BAT-C and BAT-S. As expected, the primary and secondary symptoms correlated negatively with work engagement and job satisfaction, and positively with work-related negative affect. The age of the participants (r = – 0.08–0.06, p > 0.05) and their job tenure (r = – 0.09–0.07, p > 0.05) were unrelated to both, the overall result of the BAT-C and BAT-S, and particular core and secondary symptoms.

The factor structure of BAT

Factor validity for BAT-C and BAT-S was verified with confirmatory factor analysis (CFA). Two types of models were analysed, i.e. model of correlated latent factors, in which factors of core and secondary symptoms were inter-correlated, and the bi-factor model, in which each item was loaded on a factor representing a particular symptom domain (orthogonal factors) as well as on a general factor. The models were analysed separately for BAT-C and BAT-S. The relevant goodness-of-fit indices are presented in Table 2.

Table 2. **Goodness-of-fit indices of the BAT-C and BAT-S models**

Model	χ2	Df	p	χ2/df	TLI	CFI	RMSEA [90% CI]	SRMR
BAT-C								
Correlated factors	521.53	223	<0.001	2.34	0.92	0.93	0.07 [0.07; 0.08]	0.06
Bi-factor	386.39	206	<0.001	1.88	0.94	0.96	0.06 [0.05; 0.07]	0.05
BAT-S								
Correlated factors	64.46	33	0.001	1.95	0.97	0.98	0.06 [0.04; 0.08]	0.04
Bi-factor	33.70	24	0.09	1.40	0.99	0.99	0.04 [0.00; 0.07]	0.02

Note. BAT-C = job burnout – core symptoms; BAT-S = job burnout – secondary symptoms.

The results of the analysis revealed that the model of four correlated BAT-C factors (with significant error correlation between EX2 and EX3, and EI1 and EI2 resulting from the fact that these pairs of items belong to the same subscale, have a similar content range and appear directly after each other; see Table 3 for symbols) yielded acceptable fit, which, however, was lower than for the bi-factor model. In the bi-factor model, items EX6 and MD1 had the highest loadings on a general factor. Also, the model of two correlated BAT-S factors (with PC1 and PC2 significant error correlation for the same reasons as stated above) was well-fitted to the data, although worse than the bi-factor model. In the case of the bi-factor model, item PD3 loaded most highly on a general factor. Thus, the assumed factor structure of the BAT-C was confirmed with respect to the possibility to identify four core symptoms, which are also saturated by a general factor representing burnout. Similar results were obtained for BAT-S with two factors of secondary symptoms and a general factor representing non-specific symptoms of burnout.

Convergent validity

Convergent validity was assessed with AVE, whose value for the general factors and each latent variable in the model exceeded the criterion of 0.5. An exception was the psychosomatic symptoms factor; however, its AVE was still close to the point of reference. The detailed results are presented in Table 3. As can be seen, for two items (EX2 and MD5) factor loadings were lower than for other items.

Table 3. **Factor loadings and validation indices of the confirmatory factor analysis of BAT**

Factors	Factor loadings	Validation indices
Core symptoms (BAT-C)		AVE = 0.602 CR = 0.971 α-Cronbach = 0.945
Exhaustion (EX)		
EX1. At work, I feel mentally exhausted	0.834	AVE = 0.602 CR = 0.923 α-Cronbach = 0.92
EX2. Everything I do at work requires a great deal of effort	0.566	
EX3. After a day at work, I find it hard to recover my energy	0.770	
EX4. At work, I feel physically exhausted	0.754	
EX5. When I get up in the morning, I lack the energy to start a new day at work	0.814	
EX6. I want to be active at work, but somehow, I am unable to manage	0.768	
EX7. When I exert myself at work, I quickly get tired	0.805	
EX8. At the end of my working day, I feel mentally exhausted and drained	0.861	
Mental distance (MD)		
MD1. I struggle to find any enthusiasm for my work	0.815	AVE = 0.533 CR = 0.846 α-Cronbach = 0.83
MD2. At work, I do not think much about what I am doing and I function on autopilot	0.744	
MD3. I feel a strong aversion towards my job	0.811	
MD4. I feel indifferent about my job	0.773	
MD5. I'm cynical about what my work means to others	0.438	
Cognitive impairment (CI)		
CI1. At work, I have trouble staying focused	0.793	AVE = 0.654 CR = 0.904 α-Cronbach = 0.90
CI2. At work I struggle to think clearly	0.862	
CI3. I'm forgetful and distracted at work	0.821	
CI4. When I'm working, I have trouble concentrating	0.829	
CI5. I make mistakes in my work because I have my mind on other things	0.731	

table continued on the next page

Emotional impairment (EI)		
EI1. At work, I feel unable to control my emotions	0.715	AVE = 0.611 CR = 0.887 α-Cronbach = 0.89
EI2. I do not recognize myself in the way I react emotionally at work	0.778	
EI3. During my work I become irritable when things don't go my way	0.747	
EI4. I get upset or sad at work without knowing why	0.844	
EI5. At work I may overreact unintentionally	0.817	
Secondary symptoms (BAT-S)		AVE = 0.543 CR = 0.921 α-Cronbach = 0.91
Psychological Distress (PD)		
PD1. I have trouble falling or staying asleep	0.693	AVE = 0.581 CR = 0.873 α-Cronbach = 0.86
PD2. I tend to worry	0.825	
PD3. I feel tense and stressed	0.854	
PD4. I feel anxious and/or suffer from panic attacks	0.770	
PD5. Noise and crowds disturb me	0.651	
Psychosomatic complaints (PC)		
PC1. I suffer from palpitations or chest pain	0.676	AVE = 0.490 CR = 0.837 α-Cronbach = 0.83
PC2. I suffer from stomach and/or intestinal complaints	0.692	
PC3. I suffer from headaches	0.683	
PC4. I suffer from muscle pain, for example in the neck, shoulder or back	0.796	
PC5. I often get sick	0.644	

Note. AVE – average variance extracted; CR – composite reliability coefficients

Divergent validity

Discriminant validity was assessed with the Fornell-Larcker criterion [35] with respect to job satisfaction, work engagement and work-related negative emotions. The AVE for BAT-C (0.60) was higher than its squared correlation with job satisfaction (0.27), work engagement (0.18) and negative emotions (0.53). Also, AVE for BAT-S (0.53) was higher than the value of its squared correlation with job satisfaction (0.20), work engagement (0.08) and negative emotions (0.40). Therefore, BAT-C and BAT-S can be regarded as distinct from the aforementioned work-related well-being measures.

Reliability

The reliability of the BAT-PL was evaluated with Cronbach's alpha internal consistency coefficient and the composite reliability (CR) index. As can be seen in Table 3, the values of Cronbach's alpha ranged from 0.84 for the psychosomatic symptoms subscale to 0.93 for the exhaustion subscale. For the overall results of BAT-C and BAT-S, the obtained values were higher than 0.90. Similarly, CR ranged from 0.84 for the psychosomatic symptoms subscale to 0.92 for the exhaustion subscale, and it exceeded the value of 0.90 for BAT-C and BAT-S. This points to the reliability of BAT-PL understood as the internal consistency of the tool.

Preliminary norms

The relative level of burnout can be described in reference to preliminary norms calculated on the basis of the studied group of nurses. According to the BAT manual [25], it is recommended to transform the raw results into a percentile scale. The score of each person can then be assigned to one of four categories: low (below the 25th percentile), average (between the 25th and 75th percentile), high (between the 75th and 95th percentile) or very high (above the 95th percentile). Table 4 thus presents the obtained norms in terms of primary and secondary symptoms of burnout in the studied group of nurses.

Table 4. **Preliminary norms for BAT-C and BAT-S in the sample of nurses (N = 252): range of scores**

Burnout Level	BAT-C	BAT-S
Low	1.00 – 1.90	1.00 – 1.89
Average	1.91 – 2.77	1.90 – 3.19
High	2.78 – 3.32	3.20 – 3.69
Very high	3.33 – 5.00	3.70 – 5.00

Using these norms, it is possible to describe individual outcomes with the statement: "This person has a high (or low) level of burnout compared to the average in the group of Polish nurses". However, the study group does not fully represent the population of Polish nurses despite the geographical diversity of their employment; the deviations relate to the distribution of sex to a lesser extent than to age [42]. Thus, the norms presented here are preliminary and require revision in future studies.

Discussion

The study was aimed at a preliminary psychometric analysis of the Polish version of the Burnout Assessment Tool (BAT-PL – original version by Schaufeli et al.) [25], which redefines burnout with regard to the contemporary work requirements. The factor structure of BAT-PL revealed that burnout is a syndrome of four correlated core symptoms – BAT-C, which in turn is correlated with secondary symp-

toms (BAT-S). Moreover, items of the core symptoms are saturated by the general factor of burnout, just as items of the secondary symptoms are saturated with the general factor of non-specific accompanying symptoms. This factor structure was also confirmed for other language versions [12, 29, 31]. However, in our study, the correlations obtained between latent factors were slightly lower than in the representative Flemish and Dutch group [25]. Also, factor loadings of two items from the exhaustion and mental distance subscales were slightly lower than in the Flemish and Dutch group. Nonetheless, in that group item response theory (IRT) modelling also confirmed that the BAT-C can assess burnout as a general factor [30], which is undoubtedly an asset of this tool.

The validation results also revealed that the scales of core and secondary symptoms of the BAT-PL are distinct from other work-related well-being indices, both positive and negative. Similar results differentiating between burnout and work engagement were obtained for Japanese employees [31] and Finnish civil servants [43]. The BAT-PL has high internal reliability and the presented internal consistency coefficients were close to those noted in other studies [25, 29, 31].

From a practical perspective, the BAT-PL can be used for individual assessment and for screening to identify employees at risk of burnout, as well as for comparative analyses of different professional groups [28, 30]. Therefore, this tool can be useful for both clinical practice and occupational medicine, but such an application in the Polish context requires further research to develop population norms for different occupations and clinical cut-off points.

Nonetheless, both the present study and the tool itself have their limitations. First of all, the study was conducted among nursing staff. Due to the unequal prevalence of gender in this professional group, almost all of the respondents were women. It is recommended that other professional groups and males should be included in further studies. Secondly, the participants assessed their level of burnout below the maximum values for the dimensions of core symptoms, except for the exhaustion symptom subscale. This may be due to selection bias where individuals with more severe symptoms of burnout might have been reluctant to participate in a study. This points to an important direction of further research to include employees receiving professional care due to their burnout level. What is more, further validity analyses are needed, in particular of discriminant validity against symptoms of depression. Finally, a high correlation between BAT-C and BAT-S ($r = 0.71$; 50.41% of common variance) points to the low ability of the tool to differentiate between core and secondary symptoms, which suggests that they may be represented by a single factor.

Conclusions

Bearing in mind the above-mentioned limitations, the Polish adaptation of the Burnout Assessment Tool (BAT-PL) by Schaufeli et al. should be considered as having promising psychometric properties for research on a new understanding of burnout and for further exploration of this phenomenon in clinical practice. In particular, an analysis of correlations between core (BAT-C) symptoms and secondary (BAT-S) symptoms

can contribute to a better understanding of contemporary determinants and development of burnout and its consequences at the level of individuals and organisations.

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