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Original article

Development of Korean Version Burnout Syndrome Scale (KBOSS) Using WHO's Definition of Burnout Syndrome

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ABSTRACT

Background: Burnout syndrome (BOS) is defined by the World Health Organization (WHO) as a syndrome conceptualized as resulting from chronic workplace stress that has not been successfully managed. This study aims to create the Korean version burnout syndrome scale (KBOSS) that conforms to WHO's definition of BOS and present the cut-off points for screening.
Methods: We developed the KBOSS based on WHO's definition of BOS. An online survey was conducted through a specialized online research company. We recruited 444 workers for this research. The validity of the KBOSS was assessed using factor analysis and Pearson's correlation. The KBOSS reliability was assessed using Cronbach's alpha coefficient. The cut-off points for each of the three dimensions were derived using the upper quartile score.
Results: The validity and reliability of the KBOSS were good. Regarding reliability, the scale's overall Cronbach's alpha was 0.813. Cronbach's alpha of each three-dimension was as follows: exhaustion, 0.916; cynicism, 0.865; and professional inefficacy, 0.819. The cut-off points of BOS three dimensions are exhaustion ≧ 21; cynicism ≧ 18; and inefficacy ≧ 15.
Conclusion: The developed questionnaire (KBOSS) can be a useful tool for screening of BOS.

1. Introduction

Burnout syndrome (BOS) is usually a psychological term for the experience of long-term exhaustion and diminished interest in the work context [1]. Rapid changes in the labor market and performance-oriented working environment because of the recent free-market economy and globalization cause excessive job demands for workers, which easily causes BOS [2]. Since BOS emerged as a social health problem, in 2019, the World Health Organization (WHO)'s 11th revision of the International Classification of Diseases (ICD-11) defined BOS as "a syndrome conceptualized as resulting from chronic workplace stress that has not been successfully managed" [3] (diagnostic code QD85) and distinguished it from other stress, anxiety, and mood disorders. It is characterized by three dimensions: (i) feelings of energy depletion or exhaustion increased mental distance from one's job, (ii) feelings of negativism or cynicism related to one's job, and (iii) reduced professional efficacy. In the BOS in the previous version (10th revision of the International Classification of Diseases), BOS was defined as a "problem related to life-management difficulty" (diagnostic code Z73), and its symptoms were restricted to those appearing in an exhausted state [4].

The conceptual history of BOS was first developed in the 1970s by Maslach et al., who described symptoms in healthcare workers.

Abbreviations: BOS, burnout syndrome; KBOSS, Korean version burnout syndrome scale; WHO, World Health Organization; MBI, Maslach Burnout Inventory; BCSQ, Burnout Clinical Subtypes Questionnaire; PHQ, Patient Health Questionnaires; FSS, Fatigue Severity Scale; GAD, Generalized Anxiety Disorder.

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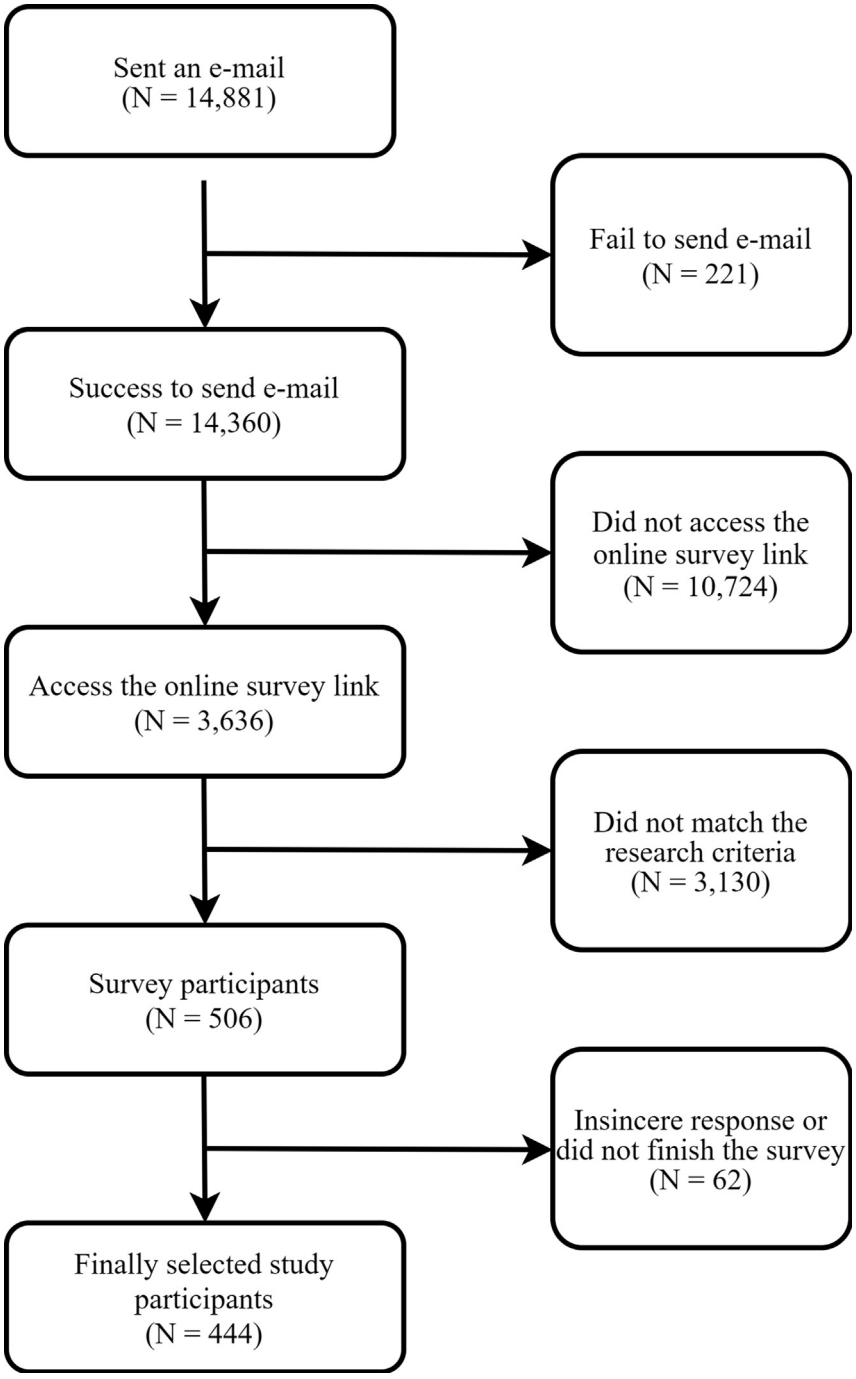

Fig. 1. Flow diagram displaying the process of selection of study participants.

They reported for the first time several characteristics in healthcare workers, especially emotional exhaustion, depersonalization (negative or cynical attitudes toward patients), and a reduced sense of personal accomplishment [5]. These three dimensions are also in good agreement with the present WHO standards.

After several studies, Maslach and Jackson developed the Maslach Burnout Inventory (MBI), a scale for measuring BOS, which is still universally used to evaluate BOS [6]. The original MBI gradually evolved, and it is categorized into several types, which are Maslach Burnout Inventory-Human Services Survey (MBI-HSS), Maslach Burnout Inventory-Educator Survey (MBI-ES), and Maslach Burnout Inventory-General Survey (MBI-GS), depending on the worker's job [5]. Additionally, Burnout Clinical Subtypes Questionnaire-36 (BCSQ-36) and Burnout Clinical Subtypes Questionnaire-12 (BCSQ-12), a shortened questionnaire for BCSQ-36, were further developed to diagnose BOS [7].

Many scales serve as useful tools for confirming BOS, but it has limitations to use test scores to make a clear screening if the worker has BOS. This is because the many current scales do not provide a cut-off score, or even if a cut-off score is presented, it is defined in various criteria, such as a case in which some of the three dimensions (exhaustion, cynicism, and inefficacy) are satisfied [8–10].

There are limitations to substituting the existing scale in the field as it is. There are cultural and linguistic differences between

countries. Therefore, even though the recent scales are useful tools, it is difficult to use them directly to evaluate the burnout of Korean workers. Past in Korea, these measurement scales have been translated and used inevitably [11]. In a study conducted by Park et al., the BOS evaluation tool was developed by reflecting Korean culture [12]. However, these evaluation tools do not sufficiently reflect the recent concept of BOS by WHO or suggest cut-off points for screening.

Accordingly, we developed the Korean version burnout syndrome scale (KBOSS) based on WHO's definition of BOS. In addition, we would like to present the cut-off points for screening to screen for BOS.

2. Methods

2.1. Research participants

The sample size was calculated for a 95% confidence interval with a 5% error, assuming the prevalence of BOS to be 30%. The prevalence was set by referring to the results of a meta-analytic study that revealed that the prevalence of BOS was about 30% [13]. According to a previous study [14], at least a total of 324 subjects are required. An online survey was conducted through the online research specialized company Macromill Embrain (www.embrain.com), a specialized online research company. The company has a total of 1,320,728 research panels, and this study has targeted some of these large numbers of members. A research panel is a survey respondent who previously announced his or her intention to participate in the survey, provided personal information through a contract with Macromill Embrain, and was different from general internet members. Only those who answered that they were waged workers over the age of 19 were selected. All survey data were provided by Macromill Embrain with personal information anonymized. The authors requested a survey of about 400 workers over the age of 19, according to the gender and age group ratio of Macromill Embrain. The company conducted a questionnaire online, as shown in the figure presented using the company's panel data [Fig. 1]. The final study participants were 444 workers. This study was approved by the Institutional Review Board of Inha University Hospital.

2.2. Questionnaire development

For questionnaire development, experts' meetings were organized among occupational and environmental medicine specialists, psychiatrists, and health science doctors. Questionnaires were reviewed and supplemented with research contents by referring to MBI-HSS (MP) (22 items, designed for professionals in the human service), MBI-GS (16 items, designed for use with most occupational groups other than human service and education), and BCSQ-36 (36 items, 12 items for each subtype, self-administered questionnaire). All three questionnaires reflect the three factors of BOS (MBI-HSS, MBI-GS; exhaustion, cynicism, and professional efficacy, BCSQ-36; frenetic, under-challenged, and worn-out). The higher score, the higher intensity of the BOS. In addition, Korean studies were also referred to in consideration of the cultural characteristics [15,16]. Referring to the previous BOS questionnaires, a total of 15 items were completed with five items of exhaustion, five items of cynicism, and five items of inefficacy. The final 12 items were completed by excluding one item with the inadequate transmission of meaning in the exhaustion section and removing one item each of cynicism and inefficacy with lower factor values in factor analysis.

Sociodemographic data included nine items on subjects' age, sex, working condition, educational background, and marital status.

To evaluate depressive symptoms, we administered the currently widely used Patient Health Questionnaires (PHQ-9). The total score ranged from 0 to 27 on a 4-point scale (0 to 3, "not at all" to "almost every day") of 9 questions. The total score is calculated by adding each item's score assigned according to severity. For this study, a depressive symptoms cut-off score of 10 or more was considered [17].

For assessing an estimated degree of fatigue, the Fatigue Severity Scale (FSS), translated into Korean by Jung and Song, was used [18]. The FSS consists of nine items, and each item is scored on a 7-point Likert scale. The higher the score, the more severe the degree of fatigue, and a total score of 5 or more indicated severe fatigue [19].

For evaluating anxiety symptoms, the Generalized Anxiety Disorder-7 (GAD-7), standardized by Seo et al. was used [20]. The total score ranges from 0 to 21 on a 4-point scale of 7 questions that can confirm anxiety symptoms during the past 2 weeks. The total score is calculated by adding the scores of each item assigned according to the frequency of symptoms. A score of 10 or more was considered to confirm anxiety symptoms [21].

2.3. Questionnaire (KBOSS)

The questionnaire was developed through literature review and expert meetings.

Occupational and environmental medicine specialists, health science doctors, and psychiatrists participated in the discussion for questionnaire development. Through several expert meetings, the researchers tried to reflect cultural characteristics and linguistic differences in Korea. In addition, after the meetings, the prototype questionnaire was provided to several related experts who spoke Korean fluently and revised through feedback. After the questionnaire development process, we finally confirmed the KBOSS questionnaire. KBOSS consists of 12 items. It consists of four items each for exhaustion, cynicism, and inefficacy. Each item is scored on a 7-point Likert scale. The score is calculated for all three dimensions, 4 to 28 points. BOS is diagnosed through the determination of whether it exceeds the cut-off point of each three dimensions.

2.4. Statistical analysis

Factor analysis was conducted to confirm the validity of this study. For verifying the criterion validity, the relationship between depressive symptoms, anxiety, and fatigue was confirmed. A reliability test was performed to validate the internal consistency of each subcategory using Cronbach's alpha.

For setting the cut-off point, the KBOSS each of three-dimensional upper quartile scores was used.

We used SPSS version 19.0 and MedCalc version 19.4 to perform the descriptive statistical analysis and all other statistical analyses.

3. Results

3.1. General characteristics

A total of 444 workers answered the survey, and the demographic characteristics of the subjects are presented in Table 1. All study subjects were workers over 19 years old; the average age was 40.6. According to the survey results, the prevalence of depression, severe fatigue, and anxiety was 32.4%, 22.3%, and 16.7%, respectively.

3.2. Reliability

To estimate the overall internal consistency of the KBOSS, we calculated Cronbach's alpha for all the 12 items on the scale. The overall Cronbach's alpha was 0.813. Cronbach's alpha of each three-

Table 1
Subject's characteristics

Variables	Numbers	%
Age		
20–29	107	24.1
30–39	107	24.1
40–49	113	25.5
50–59	117	26.4
Sex		
Male	212	47.7
Female	232	52.3
Occupation		
Field worker	30	6.8
Office worker	168	37.8
Service worker	246	55.4
Nature of employment		
Permanent	365	82.2
Temporary/contract based	79	17.8
Job duration		
<2 years	142	32.0
2–5 years	138	31.1
5–10 years	75	16.9
>10 years	89	20.0
Educational background		
<high school graduate	1	0.2
high school graduate	87	19.6
≥ college/university graduate	356	80.2
Marital status		
Never married	211	47.5
Married	209	47.1
Divorced or widowed	24	5.4
Shift work		
Yes	79	17.8
No	365	82.2
Working hours per week		
≤40 hours	184	41.4
41–51 hours	187	42.4
52–59 hours	53	11.9
≥ 60 hours	20	4.5

dimension was as follows: exhaustion, 0.916; cynicism, 0.865; and professional inefficacy, 0.819.

3.3. Validity

Fifteen questions were finally decided through an expert meeting, and factor analysis was conducted primarily for these 15 questions. As a result of the factor analysis, a question had low factor loading (item15), and two other questions presented an overlap in meaning (items 2 and, 4); therefore, a total of three questions were excluded.

Finally, factor analysis was conducted for the remaining 12 questions (Table 2). Results showed that it was grouped into three-dimensional factors, and the total explained variance for these three factors was 73.18%.

To determine the criterion validity, the correlation between the total score of the KBOSS and the total score of PHQ-9, FSS, and GAD-7 needed to be statistically significant. Each is a reliable survey method for depression, fatigue, and anxiety, which is well known as highly related to BOS. FSS showed a rather higher correlation of 0.592 (p-value < 0.001), and PHQ-9 (0.553, p-value < 0.001) and GAD-7 (0.509, p-value < 0.001) also showed significant correlation (Table 3). All three factors were significantly related to BOS.

3.4. Cut-off scores

For setting the cut-off point, the KBOSS each of three-dimensional upper quartile scores was used [10]. In previous research on mental health scales, the differences between males and females are often demonstrated by analyzing the cut-off points by classifying gender; however, the differences in gender were insignificant in this research.

In WHO's conceptual definition of BOS, it can be confirmed if a case satisfies all three characteristics (exhaustion, cynicism, and inefficacy) [3]. Therefore, in this study, the case that satisfied all three dimensions was defined as BOS by referring to the WHO definition.

3.5. BOS prevalence derived using the KBOSS

The prevalence of BOS according to gender, age, and working type is shown in Table 4. When the prevalence was classified according to gender, age, and working type, the overall BOS prevalence rate was 8.6%. The prevalence of BOS did not show a significant difference in each classification.

4. Discussion

This study derived meaningful results as it developed the KBOSS and proposed a method that can be used for early screening and intervention. WHO defined BOS's characteristics in three dimensions: (i) feelings of energy depletion or exhaustion and increased mental distance from one's job, (ii) feelings of negativism or cynicism related to one's job, and (iii) reduced professional efficacy. Therefore, it is reasonable to diagnose BOS when all three characteristics are satisfied than when using the total score.

BOS's previous studies have already demonstrated an association with depression, fatigue, and anxiety [22–24]. PHQ-9, FSS, and GAD-7 were also, respectively, each a reliable survey method for depression, fatigue, and anxiety. These three were selected for symptoms that showed symptoms that workers complaining of BOS would commonly complain of clinically. In statistical analysis, all of them showed a significant correlation, but not much high correlation coefficient was found. This seems to be a result that appears because BOS can show various clinical features rather than one specific.

Table 2
Factor analysis for the 12 questions in the KBOSS

Factor items	Communality	Factors		
		Factor 1	Factor 2	Factor 3
Item4	0.864	0.928	−-0.197	0.467
Item3	0.806	0.894	−0.213	0.449
Item1	0.677	0.823	−0.117	0.401
Item13	0.614	0.775	−0.010	0.328
Item10	0.784	−0.111	0.885	−0.486
Item12	0.599	−0.223	0.761	−0.519
Item9	0.504	−0.085	0.704	−0.296
Item11	0.336	−0.115	0.560	−0.421
Item8	0.697	0.381	−0.526	0.829
Item5	0.677	0.430	−0.538	0.811
Item7	0.628	0.384	−0.336	0.786
Item6	0.562	0.529	−0.468	0.702
Factor names		Exhaustion	Cynicism	Inefficacy
Eigenvalue		5.277	2.474	1.030
Proportion of variance		43.979	20.614	8.584
Cumulative percentage of variance		43.979	64.593	73.177
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.880		
Bartlett's Test of Sphericity	Approx. χ^2		3239.545	
	df		66	
	Sig.		.000	

Extraction Method: CFA (common factor analysis), Rotation Method: Direct Oblimin.

Table 3
Correlations between the scores of KBOSS and the total score of PHQ-9, FSS, and GAD-7

Scales	PHQ-9	FSS	GAD-7
KBOSS	0.553**	0.592**	0.509**

*: p-value<0.01, **: p-value < 0.001.

Based on the results, we proposed to diagnose BOS when all three dimensions of the cut-off score are satisfied (exhaustion ≧ 21; cynicism ≧ 18; and inefficacy ≧ 15). A relationship has already been established between BOS and depression from many previous studies [22]. However, research on the relationship between BOS and anxiety has been limited, although there is evidence for a burnout-anxiety connection [23]. Fatigue is also associated with BOS, as indicated by previous study results, but the evidence is weak compared to depression [24]. Depression is the most common mental health screening tool in the workplace [22]. When the prevalence rates of PHQ-9 and KBOSS were compared, the sensitivity is 73.7%, specificity is 71.4%.

BOS is of great interest recently because it is closely related to not only the individual worker's mental health but also the productivity of companies and society [25]. WHO has clarified the definition of BOS in ICD-11, and it has been increasingly recognized worldwide as an occupational disease. Compensation for BOS has been awarded in Denmark, France, Latvia, Portugal, and Sweden [26]. On the other hand, the social debate on BOS has recently started in Korea. This study can provide useful data to understand the fact that workers in Korea, who are still exposed to high labor intensity and working hours around the world, could have a high prevalence and incidence of BOS. According to the results of our study, the number of BOS satisfying all three dimensions was 38 out of a total of 444 workers, with a prevalence rate of 8.6%. Recently, the Korean working environment has changed in social perception, the working hours per week have decreased, but it is still above the OECD countries average [27]. Nevertheless, as to the prevalence of our study results being lower than that of studies in other countries, we used the quartile score to set the cut-off point on this scale, and when all three dimensions were satisfied, it was defined as BOS, which was more stringent than other scales.

Table 4
Prevalence of BOS when setting three dimension cut-off points

Variables	Total	BOS group* (%)	p
Age			0.238
20–29	107	11 (10.3)	
30–39	107	18 (16.8)	
40–49	113	5 (4.4)	
50–59	117	4 (3.4)	
Sex			—
Male	212	19 (9.0)	
Female	232	19 (8.2)	
Working type			0.199
Field worker	30	2 (6.7)	
Office worker	168	14 (8.3)	
Service worker	246	22 (8.9)	
Employment form			0.157
Permanent	365	33 (9.0)	
Precarious	79	5 (6.3)	
Job duration			0.213
<2 years	142	17 (12.0)	
2–5 years	138	9 (6.5)	
5–10 years	75	7 (9.3)	
>10 years	89	5 (5.6)	
Shift work			0.157
Yes	79	6 (7.6)	
No	365	32 (8.8)	
Working hours per week			0.238
≤40 hours	184	12 (6.5)	
41–51 hours	187	18 (9.6)	
52–59 hours	53	4 (7.5)	
≥ 60 hours	20	4 (20.0)	

*__BOS group:__ all three dimension's cut-off points are satisfied.

Reviewing the prevalence of workers in the 30s age group and working hours over 60 or more hours per week showed the BOS prevalence of over 15%. By age, the prevalence of BOS was higher among young workers. An important reason for the high prevalence of BOS among young workers is that they have significantly severe working pressure. This is a group with relatively low work proficiency because of short work experience and exposure to competition such as promotion and performance evaluation. The group with a low prevalence of BOS is considered to have been less likely to develop BOS because of less workload by promotion in the workplace or short working time (the 50s, more than 10 years of job duration). The prevalence of BOS among workers with over 60 hours per week was 20.0%, which is the highest compared to other groups. This suggests that working over 60 hours is an important inflection point for the outbreak of BOS.

Despite these various meaningful results, there are some limitations to this study. Although there were a large number of study participants, the larger population studies are further needed in the future to clearly understand the reliability and accuracy of the KBOSS. Additionally, the prevalence of BOS was measured equally by workers who participated in the development of the KBOSS. It is necessary to apply KBOSS to other worker groups to show the prevalence of BOS in future studies. Through this, we will be able to objectively determine the prevalence and actual condition of BOS in Korean workers.

5. Conclusion

The KBOSS presented good results, thereby providing evidence of its validity and reliability. The cut-off points of BOS's three dimensions propose exhaustion (≧21), cynicism (≧18), and inefficacy (≧15).

Authors' contributions

Conceptualization: SGP. Investigation and making scale: SGP, WHK, KBM, JYM, SHH, Methodology: HDK. Writing, original draft: HDK. Writing, review, and editing: SGP, WHK, KBM, JYM.

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Institution and ethics approval and informed consent

This study was approved by the Institutional Review Board of Inha University Hospital.

Disclaimer

None.

Conflicts of interest

The authors declare no conflict of interest.

APPENDIX 1. English version of Korean version burnout syndrome scale (KBOSS)

Please answer the questions that best reflect your current state in the workplace. Mark each item with the appropriate score from 1 (strongly disagree) to 7 (strongly agree).

Strongly disagree	Disagree	Disagree somewhat	Neither agree nor disagree	Agree somewhat	Agree	Strongly agree
1	2	3	4	5	6	7

Exhaustion	1. I feel mentally exhausted in relation to my work.	1	2	3	4	5	6	7
	2. When I think about my work, I feel chest discomfort.	1	2	3	4	5	6	7
	3. When I think about work, I feel tired and helpless.	1	2	3	4	5	6	7
	4. I feel exhausted and tired from my work these days.	1	2	3	4	5	6	7
Cynicism	5. My work is not important and is considered useless.	1	2	3	4	5	6	7
	6. I feel that my attitude toward work is not active, but has become more passive.	1	2	3	4	5	6	7
	7. My current job does not seem to help my career development.	1	2	3	4	5	6	7
	8. I feel that my identity is gradually disappearing in relation to work.	1	2	3	4	5	6	7
Inefficacy	9. If I have a hard time at work, I tend to respond appropriately.*	1	2	3	4	5	6	7
	10. I am making a helpful contribution to my current job.*	1	2	3	4	5	6	7
	11. When I get good results at work, I feel a sense of accomplishment.*	1	2	3	4	5	6	7
	12. In my work, I am confident that I can achieve good results.*	1	2	3	4	5	6	7

Total score	Exhaustion	Cynicism	Inefficacy

*9, 10, 11, and 12 are reverse coded items

APPENDIX 2. Forms of Korean version burnout syndrome scale (KBOSS)

업무와 관련해 귀하의 최근 상태를 가장 잘 반영하는 것에 답해주세요. 각각 항목에 대해 “1점” (전혀 그렇지 않다)부터 “7점” (매우 그렇다)” 까지 있으니 해당되는 점수에 표시해주십시오.

전혀 그렇지 않다	상당히 그렇지 않다	그렇지 않다	중간이다	그렇다	상당히 그렇다	매우 그렇다
1	2	3	4	5	6	7

탈진	1. 업무와 관련해 정신적으로 지쳐 있음을 느낀다.	1	2	3	4	5	6	7
	2. 업무를 생각하면 가슴이 답답함을 느낀다.	1	2	3	4	5	6	7
	3. 업무를 생각하면 피곤하고, 무기력한 느낌이 든다.	1	2	3	4	5	6	7
	4. 나는 요즘 업무로 인해 에너지가 고갈되는 느낌, 피로감을 느낀다.	1	2	3	4	5	6	7
냉소주의	5. 직장에서 현재 내가 하는 일이 중요하지 않고, 쓸모 없는 일로 여겨진다.	1	2	3	4	5	6	7
	6. 최근 업무를 대하는 자세가 적극적이지 않고, 소극적으로 바뀌었다고 느낀다.	1	2	3	4	5	6	7
	7. 현재 업무는 나의 경력계발에 도움이 되지 않는 것으로 여겨진다.	1	2	3	4	5	6	7
	8. 업무와 관련해서 직장에서 나의 존재가치가 점점 사라지고 있다고 느낀다.	1	2	3	4	5	6	7
비능률	9. 직장 업무에서 어려움이 생기면, 나는 적절하게 잘 대응하는 편이다.*	1	2	3	4	5	6	7
	10. 나는 현재 소속된 직장에 도움이 되는 기여를 하고 있다고 느낀다.*	1	2	3	4	5	6	7
	11. 직장에서 좋은 성과를 냈을 때, 나는 성취감을 느낀다.*	1	2	3	4	5	6	7
	12. 업무에서 나는 좋은 성과를 낼 수 있다는 자신감이 있다.*	1	2	3	4	5	6	7

총 점	탈진	냉소주의	비능률

* 9, 10, 11, 12번 문항은 역계산

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