Ann Occup Environ Med. 2020 Jul 16;32:e27
https://doi.org/10.35371/aoem.2020.32.e27
eISSN 2052-4374

Annals of Occupational and Environmental Medicine AOEM

Research Article

Check for updates

Validation of the Work Engagement Scale-3, used in the 5th Korean Working Conditions Survey

Maro Choi, Chunhui Suh*, Seong Pil Choi, Chae Kwan Lee, and Byung Chul Son

Department of Occupational and Environmental Medicine & Institute of Environmental and Occupational Medicine, Inje University Pusan Paik Hospital, Busan, Korea

OPEN ACCESS

Received: Dec 18, 2019
Accepted: Jul 2, 2020

***Correspondence:**
Chunhui Suh
Department of Occupational and Environmental Medicine & Institute of Environmental and Occupational Medicine, Inje University Pusan Paik Hospital, 75 Bokji-ro, Busanjin-gu, Busan 47392, Korea.
E-mail: chsuh@paik.ac.kr

ORCID iDs
Maro Choi
https://orcid.org/0000-0001-6062-5270
Chunhui Suh
https://orcid.org/0000-0002-6077-5380
Seong Pil Choi
https://orcid.org/0000-0003-4836-5773
Chae Kwan Lee
https://orcid.org/0000-0001-6836-583X
Byung Chul Son
https://orcid.org/0000-0001-8046-8911

Abbreviations
CFA: confirmatory factor analysis; CFI: comparative fit index; EWCS: European Working Conditions Survey; JD-R: Job Demands-Resources; KOSHA: Korea

ABSTRACT

Background: The purpose of this study was to assess the reliability and validity of the 3-item version of the Work Engagement Scale (WES-3), which is based on the Job Demands-Resources (JD-R) model and was used in the 5th Korean Working Conditions Survey (KWCS).
Methods: This study used data from the 5th KWCS (n = 50,205), which was conducted in 2017 with a sample of the Korean working population. The survey gathered comprehensive information on working conditions to define workforce changes and the quality of work and life. The reliability and internal consistency of the WES-3 were assessed using the corrected item-total correlation and Cronbach's alpha coefficient. Confirmatory factor analysis (CFA) was used to test the construct validity of work engagement. The convergent validity was assessed using the correlation with the WHO-5 well-being index. Correlations between work engagement and JD-R factors were also calculated.
Results: The Cronbach's alpha for work engagement was 0.776, indicating acceptable internal consistency. The model comprising 3 work engagement and 2 burnout items showed an excellent fit (χ^2: 382.05, Tucker-Lewis index: 0.984, comparative fit index: 0.994, root mean square error of approximation: 0.043). The convergent validity was significant (correlation coefficient: 0.42). Correlations with burnout and job demands were negligible, whereas correlations with job resources and job satisfaction were weakly positive.
Conclusions: The results of our study confirm that the WES-3 has acceptable reliability and validity.

Keywords: Work engagement; KWCS; Validity; Reliability; Korean

BACKGROUND

Work engagement or employee engagement is an emerging concept in the area of employee well-being. Engagement was first conceptualized by Kahn as the "harnessing of organizational members' selves to their work roles; in engagement, people employ and express themselves physically, cognitively, and emotionally during role performances" [1]. A few years later, Maslach and Goldberg [2] proposed engagement as the antipode to burnout, i.e., a goal worth achieving to prevent workers from burnout.

Occupational Safety and Health Agency; KWCS: Korean Working Conditions Survey; MBI-GS: Maslach Burnout Inventory-General Survey; OSHRI: Occupational Safety and Health Research Institute; RMSEA: Root Mean Square Error of Approximation; TLI: Tucker-Lewis Index; UWES: Utrecht Work Engagement Scale; WES-3: Work Engagement Scale-3; WHO-5: World Health Organization Five Well-Being Index.

Competing interests

The authors declare that they have no competing interest.

Availability of data and materials

Data of the Korean Working Conditions Survey were provided by the Korea Occupational Safety and Health Agency and are available at http://www.kosha.or.kr/kosha/data/primitiveData.do.

Author Contributions

Conceptualization: Suh C, Choi M; Data curation: Choi M; Formal analysis: Choi M, Choi SP; Investigation: Choi M, Suh C, Choi SP; Writing - original draft: Choi M; Writing - review & editing: Choi M, Suh C, Choi SP, Lee CK, Son BC.

With the rise of positive psychology [3], scholars' interest in engagement changed from viewing it as a tool for the prevention of burnout to recognizing the positive aspects of engagement itself. Simply put, burnout results in negative performance [4], whereas engaged people show positive performance in their work. Several studies have shown that engaged employees perform better, are more productive, and have higher levels of job satisfaction [5-8]; furthermore, this effect increases over time [9]. Thus, questions about the level of workers' engagement and how that engagement could be fostered became important.

The Job Demands-Resources (JD-R) model is considered to provide the best description of the factors contributing to work engagement and burnout. Job demands are defined as "aspects of the job that require sustained physical or mental effort" [10]. Work intensity and work-life conflicts are examples of job demands. Job demands, which are the most important predictors of burnout [11], are negatively related to work engagement. However, for those who are optimistic, job demands can be taken as a challenge and may therefore be positively related to work engagement [12]. Resources are defined as "aspects of the job that may do any of the following: i) be functional in achieving work goals; ii) reduce job demands and the associated physiological and psychological costs; and iii) stimulate personal growth and development" [10]. Coworker support, supervisor support, and organizational trust are examples of job resources. Job resources are the most important antecedents of work engagement, and they also protect workers from burnout by buffering the effects of high job demands [12].

Recently, various items measuring work engagement and burnout were added to the 6th Europe Working Conditions Survey (EWCS) and the 5th Korean Working Conditions Survey (KWCS). To measure work engagement, three items from the Utrecht Work Engagement Scale (UWES) were used. The UWES is the most widely used operationalization of work engagement in academic studies [13]. Schaufeli defined work engagement as "a positive, fulfilling, work-related state of mind that is characterized by vigor, dedication, and absorption" [14]. The UWES originally consisted of a 17-item self-report questionnaire covering three dimensions of work engagement. A shorter version with 9 items was later introduced [15] and validated in many countries around the world, including Japan, China, and Brazil [16-18]. The UWES has since been shortened to a 3-item version [19], providing a simple measurement tool that can be easily incorporated into a variety of surveys. However, only the 9-item version has been translated into South Korean [20]. The purpose of the present study was to assess the reliability and validity of the 3-item version of the Work Engagement Scale (WES-3), using the items in the 5th KWCS.

METHODS

Data

This study was based on data from the 5th KWCS conducted in 2017 by the Korea Occupational Safety and Health Agency (KOSHA) with a sample of the Korean working population (n = 50,205). The basic sample design was multistage random sampling. Enumeration districts in the 2010 Population and Housing Census were used for sampling. Data were gathered via face-to-face interviews at homes using the questionnaire. The survey gathered comprehensive information on working conditions to define workforce changes and the quality of work and life. The survey targeted the economically active population aged ≥ 15 years who were paid workers or self-employed at the time of the interview [21]. This

study used data from the Korean Working Conditions Survey (2017) from the KOSHA. Thus, no separate ethics approval was required.

Measures

The measures are listed in **Table 1**. The items in the 5th KWCS were translated from the master version of the 6th EWCS.

Data analysis

The reliability and internal consistency of the items were assessed using the corrected item-total correlation and Cronbach's alpha coefficient. For the corrected item–total correlation, a cutoff value of 0.4 for item deletion was used [24]. For the Cronbach's alpha coefficient, a threshold of 0.7 was considered acceptable, a value > 0.8 was considered good, and a value > 0.9 was considered to show excellent internal consistency [25].

Table 1. Items from the 5th KWCS used in this study

Variables	Question	Response options
Work engagement	(1) At work, I feel bursting with energy (vigor); (2) I am enthusiastic about my job (dedication); (3) Time flies when I am working (absorption)	1 (Always) to 5 (Never)
Burnout	(4) I feel exhausted at the end of the working day (exhaustion); (5) I doubt the importance of my work (cynicism); (6) In my opinion, I am good at my job (professional efficacy) [22]	1 (Always) to 5 (Never)
Work-family conflict	How often in the last 12 months, have you… (1) worried about work when you were not working; (2) felt too tired after work to do some of the household jobs that need to be done; (3) found that your job prevented you from giving the time you wanted to give to your family; (4) found it difficult to concentrate on your job because of family responsibilities; (5) found that your family responsibilities prevented you from giving the time you should to your job.	1 (Always) to 5 (Never)
Work intensity	Do you have enough time to get the job done?	1 (Always) to 5 (Never)
Emotional demands	Does your main paid job involve being in situations that are emotionally disturbing for you?	1 (All of the time) to 7 (Never)
Job control	Are you able to choose or change… (1) the order of your tasks; (2) your methods of work; (3) the speed or rate of work?	Yes or No
Supervisor support	Your manager helps and supports you.	1 (Always) to 5 (Never)
Coworker support	Your colleagues help and support you.	1 (Always) to 5 (Never)
Opportunities for development (quality)	Do you agree or disagree with the following statements regarding the training received over the last 12 months? (1) The training has helped me improve the way I work; (2) I feel that my job is more secure because of my training; (3) I feel that my prospects for future employment are better.	1 (Strongly agree) to 5 (Strongly disagree)
Opportunities for development (quantity)	Over the past 12 months, how many days in total did you spend in training paid for or provided by your employer? Over the past 12 months, how many days in total did you spend in training paid for by yourself?	1 day or less, 2–3 days, 4–5 days, 6–9 days, 10–19 days, 20 days or more
Organizational trust	These questions are about your workplace. To what extent do you agree or disagree with the following statements? (1) Employees are appreciated when they have done a good job. (2) The management trusts the employees to do their work well. (3) Conflicts are resolved in a fair way. (4) The work is distributed fairly. (5) There is good cooperation between you and your colleagues. (6) In general, employees trust management.	1 (Strongly agree) to 5 (Strongly disagree)
Role clarity	You know what is expected of you at work.	1 (All of the time) to 5 (At no time)
Psychological well-being[a]	Please indicate which of the following five statements is closest to how you have been feeling over the last two weeks. (1) I have felt cheerful and in good spirits. (2) I have felt calm and relaxed. (3) I have felt active and vigorous. (4) I wake up feeling fresh and rested. (5) My daily life has been filled with things that interest me.	1 (All of the time) to 5 (At no time)
Job satisfaction	On the whole, how would you describe your feelings about the working conditions in your main paid job?	Very satisfied; Satisfied; Not very satisfied; Not at all satisfied

KWCS: Korean Working Conditions Survey; WHO-5: World Health Organization Five Well-Being Index.
[a]The inter-rater reliability of the psychological well-being measure (WHO-5) in a previous study was 0.80 [23].

https://doi.org/10.35371/aoem.2020.32.e27

Validity

CFA was used to test the construct validity of work engagement. The UWES assessment of work engagement comprises three theoretical constructs and is based on the idea that engagement is the antithesis of burnout. Four sets of models were tested to evaluate the work engagement construct and to determine whether work engagement could be differentiated from burnout (**Fig. 1**). The first model (M1) assumed that all items were loaded on one general well-being factor. The second model (M2) assumed that three work engagement items represented one factor and three burnout items represented another. The third model (M3) grouped four positive items (three items addressing work engagement and one differentiating professional efficacy from burnout) into one factor and two negative items (exhaustion and cynicism components of burnout) into another. In this case, professional efficacy was not reverse scored. The final model (M4) grouped three work engagement items into one and two negative items regarding burnout into a second factor. For the fit indices, the chi-square test, comparative fit index (CFI), Tucker-Lewis index (TLI), and root mean square error of approximation (RMSEA) were used. Generally, CFI and TLI values ≥ 0.95 and RMSEA ≤ 0.06 are considered acceptable [26,27]. Pearson's correlation coefficients between work engagement and the World Health Organization Five Well-Being Index (WHO-5) well-being index were calculated to examine convergent validity. Correlations between work engagement and other JD-R factors were also calculated. Correlations below 0.20 were considered weak, those between 0.2 and 0.30 were considered moderate, and those greater than 0.30 were considered strong [28]. IBM SPSS AMOS ver. 25 software (IBM Corp., New York, NY, USA) was used for analyses.

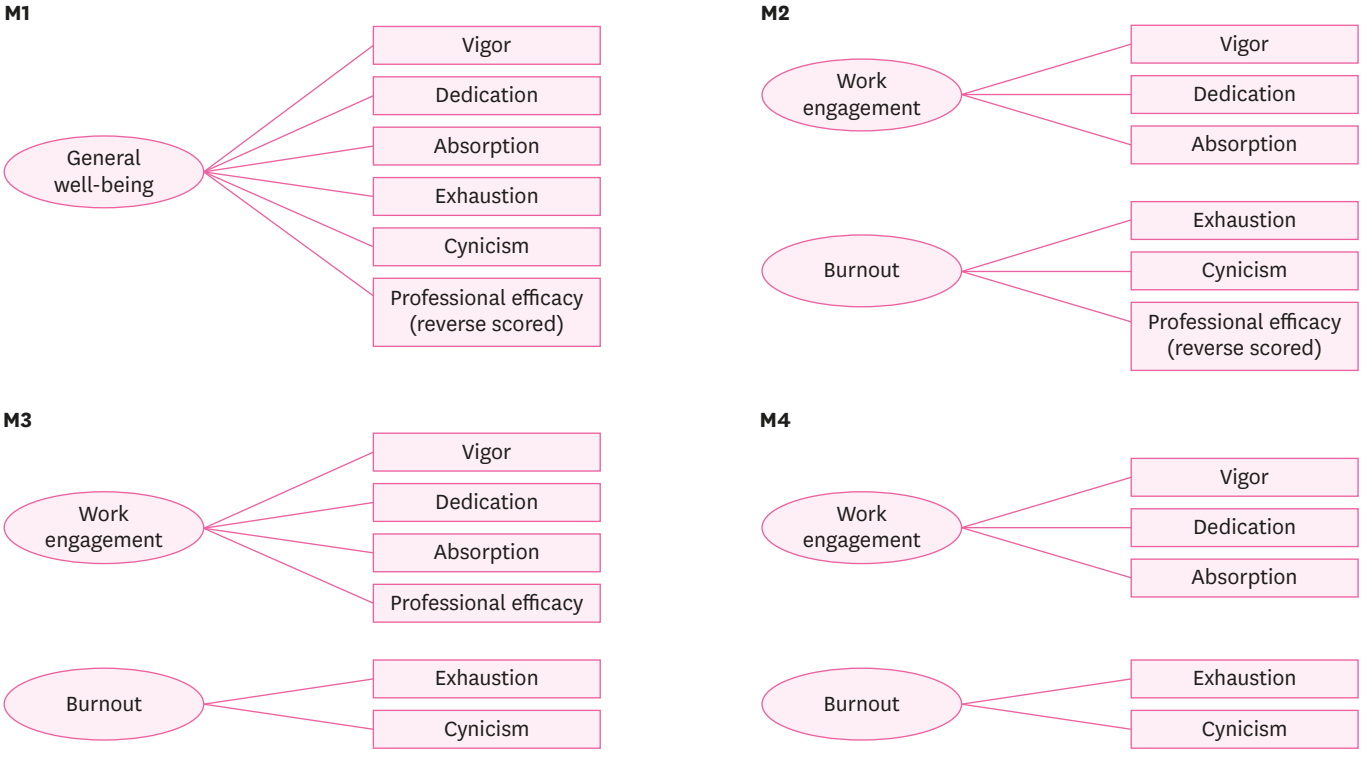

Fig. 1. Models for construct validity.

Table 2. Characteristics of the study population

Variables	No. (%)
Total	50,205 (100.0)
Gender	
Men	28,679 (57.1)
Women	21,526 (42.9)
Age (years)	
15–19	417 (0.8)
20–29	7,002 (13.9)
30–39	10,578 (21.1)
40–49	12,323 (24.5)
50–59	11,704 (23.3)
60 and older	8,182 (16.3)
Occupation	
Managers	291 (0.6)
Professionals and related workers	10,027 (20.0)
Office clerks	9,496 (18.9)
Service workers	6,020 (12.0)
Sales workers	6,623 (13.0)
Skilled agricultural, forestry, and fishery workers	2,725 (5.4)
Crafts and related workers	4,870 (9.7)
Machine operation and assembly workers	5,381 (10.7)
Elementary workers	4,653 (9.3)
Military workers	119 (0.2)
Employment status	
Self-employed	10,707 (21.3)
Employee (≥ 1 year)	30,125 (60.0)
Employee (< 1 year) & miscellaneous	9,373 (18.7)

RESULTS

Characteristics of the study population

Respondents' characteristics are shown in **Table 1**. The total number of respondents came to 50,205 (male 57%, female 43%). Of these, 69, 106, and 79 people refused to answer or provided unclear responses to the vigor, dedication, and absorption items, respectively. The highest proportion of respondents in terms of age were people in their 40s (24.5%), and professionals were the most frequent respondents in terms of occupational category (20.0%). Sixty percent of respondents were employees who had been employed for more than a year at their current position (**Table 2**).

Reliability

The corrected item-total correlation was 0.56–0.65; thus, no item was deleted. The Cronbach's alpha for work engagement was 0.776, indicating acceptable internal consistency (**Table 3**).

Table 3. Corrected item-total correlations and Cronbach's alpha of WES-3

Items	Corrected item-total correlation	Cronbach's alpha if item was deleted
Vigor	0.628	0.681
Dedication	0.651	0.654
Absorption	0.559	0.756
Cronbach's alpha	0.776	

A value above the threshold of 0.7 is considered acceptable, > 0.8 is considered good, and a value > 0.9 indicates excellent internal consistency.
WES: 3-item version of the Work Engagement Scale.

https://doi.org/10.35371/aoem.2020.32.e27

Validity

The results of CFA are shown in **Table 3**. As expected, M1, with one latent well-being factor, was not a good fit for the data. M2, with 2 different well-being factors, i.e., work engagement and burnout, also showed a poor fit. M3, which included four positive items (3 work engagement items and 1 unreversed burnout item) showed an excellent model fit (fit indices: χ^2[9]: 633.97, TLI: 0.986, CFI: 0.993, RMSEA: 0.039). M4, which had three work engagement and 2 burnout items, also showed an excellent fit (χ^2[4]: 382.05, TLI: 0.984, CFI: 0.994, RMSEA: 0.043) (**Table 4**). The convergent validity was significant, with correlation coefficients of 0.42 for vigor, 0.37 for dedication, and 0.27 for absorption.

Correlations with JD-R factors

Correlations with other items in the 5th KWCS are shown in **Table 5**. The correlations with other work engagement items were moderate (0.47 to 0.60), and those with the total score were high (0.80 to 0.85). Correlations for exhaustion and cynicism were negligible (−0.04 to 0.07), and that for reduced professional efficacy was weak to moderate and negative (−0.59 to −0.44). Correlations with job demands were negligible (−0.23 to 0.05), and those with job resources (0.02 to 0.44) and job satisfaction (0.20 to 0.30) were weakly positive (**Table 5**).

Table 4. Confirmatory factor analysis fit indices of WES-3

Model	χ^2	df	TLI	CFI	RMSEA
M1[a]	12608.18	9	0.624	0.839	0.167
M2[b]	12599.72	8	0.577	0.839	0.177
M3[c]	634.97	8	0.986	0.993	0.039
M4[d]	382.05	4	0.984	0.994	0.043

CFI and TLI values ≥ 0.95 and RMSEA ≤ 0.06 are considered to indicate excellent fit.
TLI: Tucker-Lewis index; CFI: comparative fit index; RMSEA: root mean square error of approximation; WES-3: 3-item version of the Work Engagement Scale.
[a]Grouped 3 work engagement items and 3 burnout items together; [b]grouped 3 work engagement items and 3 burnout items separately; [c]grouped 4 positive items and 2 negative items; [d]grouped 3 work engagement items and 2 negative burnout items.

Table 5. Correlation coefficients of WES-3 with KWCS items

Measures	Vigor	Dedication	Absorption	Total
Work engagement				
Vigor	1			0.83
Dedication	0.60	1		0.85
Absorption	0.47	0.50	1	0.80
Burnout				
Exhaustion	0.04	0.02	0.07	0.05
Cynicism	−0.01[a]	−0.05	−0.04	−0.04
Reduced professional efficacy	−0.51	−0.51	−0.44	−0.59
Psychological well-being	0.42	0.37	0.27	0.42
Job demands				
Work-family conflict	−0.06	−0.07	−0.08	−0.09
Work intensity	−0.19	−0.20	−0.17	−0.23
Emotional demands	−0.02	−0.03	−0.03	−0.03
Job resources				
Job control	0.02	0.06	0.07	0.06
Supervisor support	0.36	0.38	0.34	0.31
Coworker support	0.24	0.26	0.22	0.29
Opportunities for development (quality)	0.21	0.19	0.13	0.22
Opportunities for development (quantity)	0.05	0.09	0.08	0.09
Organizational trust	0.36	0.38	0.33	0.44
Role clarity	0.27	0.33	0.27	0.35
Job satisfaction	0.28	0.26	0.20	0.30

Only 30,125 answers from employees with > 1 year on the job were used for "Supervisor support" and "Opportunities for development (quantity)."
WES-3: 3-item version of the Work Engagement Scale; KWCS: Korean Working Conditions Survey.
[a]$p < 0.05$. All other correlations, $p < 0.01$.

https://doi.org/10.35371/aoem.2020.32.e27

DISCUSSION

The current study is the first to validate the three-item version of the Work Engagement Scale in Korea. The internal consistency was acceptable; Cronbach's alpha was > 0.776, and inter-item and item-total correlations were > 0.40. The construct validity of work engagement was assessed via CFA. The model with three work engagement items and two burnout items showed an excellent fit (χ^2[4]: 382.05, TLI: 0.984, CFI: 0.994, RMSEA: 0.043). Convergent validity using the WHO-5 well-being index was significant. These results suggest that the WES-3 is a reliable measure of work engagement in the Korean context.

We assumed that work engagement consists of three dimensions and that it is antithetical to burnout. Among our tested models, M3 and M4 showed excellent fit (**Table 4**). Vigor and dedication vs. exhaustion and cynicism are considered the core dimensions of work engagement and burnout, and absorption vs. professional inefficacy constitute, to some degree, a consequence of the former dimensions [11,29]. Some controversies about the relationships among these dimensions have arisen, e.g., associating professional efficacy with work engagement or with burnout [14,29,30]. Our data from M3 suggested that professional efficacy was associated with work engagement. However, this association may be the result of our using the third item measuring burnout, which is a positive item that asks about professional efficacy. However, it is questionable whether inefficacy can be assessed by simply reversing the score for efficacy [30]. The single item addressing professional efficacy may have been interpreted as referring to self-efficacy in personal resources. Thus, a questionnaire consisting only of negative items may be needed to avoid the reverse-scoring dilemma. M4 also showed an excellent fit, indicating that the 3 work engagement items and two core burnout items represent distinctive components of well-being.

Convergent validity was assessed using Pearson's correlation. Correlations with psychological well-being were moderate to strong, consistent with the findings of a previous study [31]. Correlations with other psychosocial factors at work were also assessed. The expected results were observed in correlations between work engagement and the JD-R model. As described earlier, work demands may lower work engagement; however, in certain personalities, they may increase work engagement. Thus, a negligible or weakly negative correlation was expected. In a study that validated the work engagement scale in 5 separate countries [19], the correlations of work engagement with work overload, emotional demand, and work–home conflict ranged from −0.01 to 0.17, −0.07 to 0.10, and −0.10 to −0.08, respectively. In our study, correlations with emotional demand and work-home conflict were consistent with those in other countries. Work intensity was also negligible, although it differed from work overload. Correlations with job resources were mostly weakly positive, consistent with other studies [19]. Correlations with supervisor support, coworker support, role clarity, and organizational trust were 0.19 to 0.37, 0.11 to 0.30, 0.29 to 0.37, and 0.37 to 0.39, respectively. However, the correlations of job control and opportunity with development were lower than those reported in other studies. Survey items may have differed among countries; observed differences may also have varied according to the culture of the country. Investigations of cross-national invariances of these measures are needed.

Correlations with job satisfaction were also positive, consistent with other studies [32,33]. However, the correlation with burnout was unexpected. We anticipated a weakly negative correlation between work engagement and burnout [16,20], but our results showed no correlation. The following considerations may explain this result. First, unlike most

other studies, our research included a variety of occupations. There are 5 types of burnout questionnaires, which differ among occupational groups. The items used in this study were from the Maslach Burnout Inventory-General Survey (MBI-GS) questionnaire, which is best suited for general use. Nonetheless, it cannot assess burnout of workers in all occupations. This was apparent for certain occupational groups who answered the questionnaire [30]. Second, work engagement and burnout could be independent factors from the beginning. Although work engagement and burnout are conceptual opposites, in reality, work engagement and burnout can coexist in one's mind. For example, an employee can be engaged in task A, while feeling burnout in task B. If employees were asked whether they were feeling engaged or experiencing burnout in their job, they might well say both. These reactions can coexist, and they might be mutually independent. Finally, the translation may have affected the results. KOSHA translated items from the EWCS and then used those items in the KWCS. The translated wording was not identical to the Korean version of UWES [20] and the MBI-GS [34]. The psychological meaning of questionnaire items can be altered during the translation process. Such changes may have lowered the correlation between work engagement and burnout, as compared to findings from other studies.

This study had some limitations. First, the WES-3 was not directly compared with other validated versions of UWES. However, the WES-3 showed good reliability and excellent validity in this study. Further studies comparing WES-3 and the existing UWES-K [20] are needed. Second, the evaluation of convergent and divergent validity based on the JD-R model was limited because the questionnaires in the KWCS were not previously validated. Although we reported the correlation coefficients of those factors (**Table 5**), the ability of the KWCS to show convergent and divergent validity remains limited. Further studies assessing the validity of the psychosocial factors of work in the KWCS are needed. Finally, the WES-3 differs from the ultra-short version of UWES. For instance, the same items were used for the vigor and dedication dimensions, but not for absorption. “Time flies when I am working” was used in WES-3, whereas “I am immersed in my work” was used in the ultra-short version of UWES. Since this is a developer-selected item, it is likely that the UWES-3 items would be used in subsequent surveys.

Despite these limitations, this study is the first to validate the three-item version of the Work Engagement Survey in South Korea. The nine-item Korean version of UWES [20] was validated in 2017, but in aspects of decreasing respondent burden and increasing response rates due to survey length [35], validation of the WES-3 is very meaningful. We used the survey data from the KWCS, a large sample of more than 50,000 Korean workers that includes all occupational groups. Thus, we can generalize the validation of the WES-3 to Korean workers in general. Because the questionnaire measuring work engagement was included in the national survey, we hope that data on work engagement become more accessible and central to human resources management in Korea.

CONCLUSIONS

In summary, this study confirmed that the WES-3 has acceptable internal consistency, excellent model fit, and significant positive correlation with psychological well-being. Therefore, the WES-3 is an acceptable measure of work engagement in South Korea.

https://doi.org/10.35371/aoem.2020.32.e27

ACKNOWLEDGEMENTS

We would like to thank the Safety and Health Policy Research Department (Occupational Safety and Health Research Institute; OSHRI) for offering raw data of KWCS. The paper's contents are solely the responsibility of the author and do not necessarily represent the official view of the OSHRI.

REFERENCES

1. Kahn WA. Psychological conditions of personal engagement and disengagement at work. Acad Manage J 1990;33:692-724.
2. Maslach C, Goldberg J. Prevention of burnout: new perspectives. Appl Prev Psychol 1998;7(1):63-74. CROSSREF
3. Seligman ME, Csikszentmihalyi M. Positive psychology. An introduction. Am Psychol 2000;55(1):5-14. PUBMED | CROSSREF
4. Bakker AB, Demerouti E, Verbeke W. Using the Job Demands-Resources model to predict burnout and performance. Hum Resour Manage 2004;43(1):83-104. CROSSREF
5. Bakker AB, Demerouti E. Towards a model of work engagement. Career Dev Int 2008;13(3):209-23. CROSSREF
6. Christian MS, Garza AS, Slaughter JE. Work engagement: a quantitative review and test of its relations with task and contextual performance. Person Psychol 2011;64(1):89-136. CROSSREF
7. Rich BL, Lepine JA, Crawford ER. Job engagement: antecedents and effects on job performance. Acad Manage J 2010;53(3):617-35. CROSSREF
8. Schaufeli WB. Work engagement in Europe. Organ Dyn 2018;47(2):99-106. CROSSREF
9. Shimazu A, Schaufeli WB, Kamiyama K, Kawakami N. Workaholism vs. work engagement: the two different predictors of future well-being and performance. Int J Behav Med 2015;22(1):18-23. PUBMED | CROSSREF
10. Demerouti E, Bakker AB, Nachreiner F, Schaufeli WB. The job demands-resources model of burnout. J Appl Psychol 2001;86(3):499-512. PUBMED | CROSSREF
11. Lee RT, Ashforth BE. A meta-analytic examination of the correlates of the three dimensions of job burnout. J Appl Psychol 1996;81(2):123-33. PUBMED | CROSSREF
12. Bakker AB, Demerouti E, Sanz-Vergel AI. Burnout and work engagement: the JD-R approach. Annu Rev Organ Psychol Organ Behav 2014;1(1):389-411. CROSSREF
13. Farndale E, Beijer S, Van Veldhoven M, Kelliher C, Hope-Hailey V. Work and organisation engagement: aligning research and practice. J Org Effect 2014;1:157-76. CROSSREF
14. Schaufeli WB, Salanova M, González-Romá V, Bakker AB. The measurement of engagement and burnout: a two-sample confirmatory factor analytic approach. J Happiness Stud 2002;3(1):71-92. CROSSREF
15. Schaufeli WB, Bakker AB, Salanova M. The measurement of work engagement with a short questionnaire: a cross-national study. Educ Psychol Meas 2006;66(4):701-16. CROSSREF
16. Fong TC, Ng SM. Measuring engagement at work: validation of the Chinese version of the Utrecht Work Engagement Scale. Int J Behav Med 2012;19(3):391-7. PUBMED | CROSSREF
17. Shimazu A, Schaufeli W, Kosugi S, Suzuki A, Nashiwa H, Kato A, et al. Work engagement in Japan: validation of the Japanese version of the Utrecht Work Engagement Scale. Appl Psychol 2008;57(3):510-23. CROSSREF

18. Vazquez AC, Magnan ES, Pacico JC, Hutz CS, Schaufeli WB. Adaptation and validation of the Brazilian version of the Utrecht Work Engagement Scale. Psico-USF 2015;20(2):207-17.
CROSSREF

19. Schaufeli WB, Shimazu A, Hakanen J, Salanova M, De Witte H. An ultra-short measure for work engagement: the UWES-3 validation across five countries. Eur J Psychol Assess 2017;35(4):577-91.
CROSSREF

20. Kim WH, Park JG, Kwon B. Work engagement in South Korea: validation of the Korean version 9-item Utrecht Work Engagement Scale. Psychol Rep 2017;120(3):561-78.
CROSSREF

21. Occupational Safety & Health Research Institute (KR). Final Report of the fifth Korean Working Conditions Survey. Ulsan: Occupational Safety & Health Research Institute; 2017.

22. Maslach C, Jackson SE, Leiter MP, Schaufeli WB, Schwab RL. Maslach Burnout Inventory. Palo Alto: Consulting Psychologists Press; 1986.

23. Moon YS, Kim HJ, Kim DH. The relationship of the Korean version of the WHO Five Well-Being Index with depressive symptoms and quality of life in the community-dwelling elderly. Asian J Psychiatr 2014;9:26-30.
PUBMED | CROSSREF

24. Aday LA, Cornelius LJ. Designing and conducting health surveys: a comprehensive guide. San Francisco: John Wiley & Sons; 2006.

25. Taber KS. The use of Cronbach's alpha when developing and reporting research instruments in science education. Res Sci Educ 2018;48(6):1273-96.
CROSSREF

26. Bentler PM, Bonett DG. Significance tests and goodness of fit in the analysis of covariance structures. Psychol Bull 1980;88(3):588-606.
CROSSREF

27. Browne MW, Cudeck R. Alternative ways of assessing model fit. Sociol Methods Res 1992;21(2):230-58.
CROSSREF

28. Hemphill JF. Interpreting the magnitudes of correlation coefficients. Am Psychol 2003;58(1):78-9.
PUBMED | CROSSREF

29. González-Romá V, Schaufeli WB, Bakker AB, Lloret S. Burnout and work engagement: independent factors or opposite poles? J Vocat Behav 2006;68(1):165-74.
CROSSREF

30. Schaufeli WB, Salanova M. Efficacy or inefficacy, that's the question: burnout and work engagement, and their relationships with efficacy beliefs. Anxiety Stress Coping 2007;20(2):177-96.
PUBMED | CROSSREF

31. Bartels AL, Peterson SJ, Reina CS. Understanding well-being at work: Development and validation of the eudaimonic workplace well-being scale. PLoS One 2019;14(4):e0215957.
PUBMED | CROSSREF

32. Panthee B, Shimazu A, Kawakami N. Validation of Nepalese version of Utrecht Work Engagement Scale. J Occup Health 2014;56(6):421-9.
PUBMED | CROSSREF

33. Karanika-Murray M, Duncan N, Pontes HM, Griffiths MD. Organizational identification, work engagement, and job satisfaction. J Manag Psychol 2015;30(8):1019-33.
CROSSREF

34. Shin KH. The Maslach Burnout Inventory-General Survey (MBI-GS): an application in South Korea. Korean J Ind Organ Psychol 2003;16:1-17.

35. Fisher GG, Matthews RA, Gibbons AM. Developing and investigating the use of single-item measures in organizational research. J Occup Health Psychol 2016;21(1):3-23.
PUBMED | CROSSREF