Research Article

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Abbreviations
PERMA: Positive emotion, Engagement,
Relationships, Meaning, and Accomplishment;
MHC-SF: Mental Health Continuum-Short
Form; UWES: Utrecht Work Engagement
Scale; KOSS-SF: Korean Occupational
Stress Scale-Short Form; MBI-GS: Maslach
Burnout Inventory-General Survey; PWI-SF:
Psychosocial Well-being Index-Short Form;
CFA: confirmatory factor analysis; CFI:
comparative fit index; TLI: Tucker-Lewis
index; RMSEA: root mean square error of

Korean translation and validation of the Workplace Positive emotion, Engagement, Relationships, Meaning, and Accomplishment (PERMA)-Profiler

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ABSTRACT

Background: No tool is available for the multidimensional measurement of workplace well-being among Korean workers. In this study, the Workplace Positive emotion, Engagement, Relationships, Meaning, and Accomplishment (PERMA)-Profiler, a multidimensional workplace well-being measure, was translated into Korean, and its validity and reliability were assessed.

Methods: The Workplace PERMA-Profiler, including the positive emotion, engagement, relationships, meaning, and accomplishment domains, was translated according to international guidelines. The questionnaires included the Workplace PERMA-Profiler, Mental Health Continuum-Short Form, Utrecht Work Engagement Scale, Maslach Burnout Inventory-General Survey, Psychosocial Well-being Index-Short Form, and Korean Occupational Stress Scale-Short Form. A total of 316 Korean workers completed a web-based survey with adequate response. Cronbach's alpha values were calculated to assess scale reliability, and correlational and confirmatory factor analyses were used to assess validity.

Results: Cronbach's alpha values for the Korean Workplace PERMA-Profiler ranged from 0.70 to 0.95. Confirmatory factor analysis indicated that the 5-factor model had a marginally acceptable fit [$\chi^2(80)$ = 383.04, comparative fit index = 0.909, Tucker-Lewis index = 0.881, root mean square error of approximation = 0.110, and standardized root mean square residual = 0.054]. The 5-factor PERMA domains were correlated positively with work engagement and mental well-being in life, and negatively with burnout, occupational stressors, and stress responses. These results showed that the Workplace PERMA-Profiler has good convergent and divergent validity.

Conclusions: The Korean version of the Workplace PERMA-Profiler had good reliability and validity. It might be used as an indicator or evaluation tool for positive mental health interventions in the workplace.

Keywords: PERMA; Workplace; Well-being; Reliability; Validity; Korean

BACKGROUND

Well-being is defined broadly as "the quality and state of a person's life" [1]. Well-being is related to outcomes such as greater educational and occupational success, stronger

approximation; SRMR: standardized root mean square residual; EX: exhaustion; CY: cynicism; PE: professional efficacy; P: positive emotion; E: engagement; R: relationships; M: meaning; A: accomplishment; N: negative emotion; H: health; df: degrees of freedom.

friendships, and better physical health [2]. The role of well-being in the professional environment is important. There are 3 broad approaches to the understanding of well-being at work. The 3 approaches consider individual health of workers, mental illness of organizations and potential societal consequences. These eventually affect productivity as well [3-7]. Therefore, measurement of the abstract concept of well-being in the workplace is important for research and practice.

No single best model of well-being exists, but different conceptualizations can aid examination of the abstract construct of well-being and provide concrete domains that can be measured and developed. Several measurement instruments with positive approaches address mental health in general; most of these measures do not include the occupational arena [8]. Specifically, we focus on the 5 domains of the Positive emotion, Engagement, Relationships, Meaning, and Accomplishment (PERMA) theory defined by Seligman [9]: positive emotion (P), engagement (E), relationships (R), meaning (M), and accomplishment (A). Kern developed the Workplace PERMA-Profiler based on PERMA theory. Application of the PERMA factors in the different contexts of life and work suggested that the concepts of the original PERMA-Profiler and Workplace PERMA-Profiler are distinct. The Workplace PERMA-Profiler is adjusted to the workplace context, enabling the multidimensional evaluation of workers' well-being. The PERMA-Profiler has shown acceptable psychometric properties in assessments conducted with several different international samples [10].

In Korea, the original PERMA-Profiler has been translated and used in some studies, but its validity has not been reported [11,12]. The Workplace PERMA-Profiler has not been translated into Korean or validated in Korean studies. In this study, the Workplace PERMA-Profiler was translated into Korean, and the Korean version was validated.

METHODS

The Workplace PERMA-Profiler was translated according to the International Society for Pharmacoeconomics and Outcomes Research task force guidelines [13,14], as follows. 1) Preparation; we obtained permission from the developer, Peggy Kern, to use and translate the Workplace PERMA-Profiler into Korean. 2) Forward translation; we had 2 independent translators translate the Workplace PERMA-Profiler into Korean; the translators were fully capable of translating the instrument with sufficient explanation. 3) Reconciliation; the translation panel compared and merged 2 versions of the newly translated the Workplace PERMA-Profiler and the original PERMA-Profiler as references [11,12], yielding a final single forward-translated Profiler. 4) Back translation; a professional translator translated the Korean version of the Workplace PERMA-Profiler back into the original language. 5) Back translation review; the developer compared the back-translated version of the Workplace PERMA-Profiler with the original instrument to identify any discrepancies. 6) Cognitive debriefing; we tested the translated Workplace PERMA-Profiler with 34 respondents to evaluate its understandability and interpretation. 7) Proofreading; a Korean linguist reviewed the final Profiler and corrected minor errors, such as typographic and grammatical errors. The full version of the Korean Workplace PERMA-Profiler was attached to **Appendices 1** and **2**.

The validation study was conducted as an online survey. The internal consistency, structural validity, and convergent and divergent validity of the Korean version of the Workplace PERMA-Profiler were investigated.

Study subjects

Participants were drawn from workers registered with an internet survey company, which had access to more than 1,300,000 potential participants in Korea, and recruited participants based on their gender, age and residential area. The survey company recruited Korean workers who lived in Korea and were aged ≥ 18 years from their pool of potential participants until the target number was reached. In general, it is recommended that at least 10 subjects per scale item be included for factor analysis [15], and more than 100 subjects for Cronbach's alpha values [16]. To ensure the acceptability of the statistical analysis, we decided to use a subjects-to-item ratio > 10. Eligible workers who agreed to participate in the online survey were given access to the self-report questionnaire. The instructions assured the protection of personal information and only those who wanted to participate in this study were asked to complete the questionnaire. Participating workers were awarded points for survey completion that could be cashed out and used for shopping. In total, 326 workers completed the web-based questionnaire; 3% of respondents with short response times were excluded because their responses were considered to be inadequate. The final sample consisted of 316 participants.

Measures

Participants completed an online self-reported survey that included the Korean Workplace PERMA-Profiler and questions from the Mental Health Continuum-Short Form (MHC-SF), Utrecht Work Engagement Scale (UWES), Korean Occupational Stress Scale-Short Form (KOSS-SF), Maslach Burnout Inventory-General Survey (MBI-GS), and Psychosocial Well-being Index-Short Form (PWI-SF). As questionnaires that measure concepts similar to those measured by the Korean Workplace PERMA-Profiler, we used the MHC-SF, which measures three dimensions of mental well-being in life, and the UWES, which measures work engagement. To measure the opposite concept of work engagement, we used the MBI-GS, which measures burnout. To assess occupational stressors and stress responses, we used the KOSS-SF and PWI-SF. The final section of the survey consisted of basic demographic questions about participants' age, gender, level of education attained, residential area, job type, and employment status.

The Korean Workplace PERMA-Profiler

The Korean version of the Workplace PERMA-Profiler was used to measure multidimensional well-being at work. It includes the 15 main PERMA items (3 items per domain) and 8 filler items that assess overall well-being (one item), physical health (3 items), negative emotion (3 items), and loneliness (one item). To allow for a broad range of responses with sufficient variation, responses are structured by a Likert scale ranging from 0 to 10, with 0 indicating extremely low levels and 10 indicating extremely high levels. Composite scores for each domain were calculated by taking the mean of the 3 domain items [17].

MHC-SF

The MHC-SF measures positive mental health. It comprises 14 items on emotional (3 items), psychological (6 items), and social (5 items) well-being. Total scores range from 0 to 70, with higher scores reflecting greater mental well-being in life. Cronbach's alpha value for the K-MHC-SF in a previous study was 0.93 [18].

UWES

Work engagement was measured using the UWES-9 [19], which investigates experience using the constructs of vigor, dedication, and absorption. Responses to items are given on a

frequency scale ranging from 0 (never) to 6 (always). Cronbach's alpha value for the UWES-Ķ in a previous study was 0.91[20].

KOSS-SF

Job stress was measured using 24 items of the KOSS-SF, a self-reported questionnaire for the estimation of unique and specific occupational stressors among Korean employees. Chang et al. [21] validated the reliability of the KOSS in a nationwide epidemiological study (the NSDSOS Project) conducted in Korea.

The KOSS-SF subscales used in this study were job demands (4 items, Cronbach's alpha = 0.58), insufficient job control (4 items, Cronbach's alpha = 0.67), inadequate social support (3 items, Cronbach's alpha = 0.55), job insecurity (2 items, Cronbach's alpha = 0.73), the organizational system (4 items, Cronbach's alpha = 0.67), lack of rewards (3 items, Cronbach's alpha = 0.72), and occupational climate (4 items, Cronbach's alpha = 0.71). Each questionnaire item was rated on a Likert scale ranging from 1 (not at all) to 4 (very much).

MBI-GS

Burnout was assessed with the Korean version of the MBI-GS [22]. The MBI-GS has three subscales: exhaustion (EX), cynicism (CY), and professional efficacy (PE). All items were scored on a 7-point frequency scale ranging from 0 (never) to 6 (always). High EX and CY scores and low PE scores are indicative of burnout. Cronbach's alpha values for the EX, CY, and PE subscales in a previous study were 0.90, 0.81, and 0.86, respectively [23].

PWI-SF

Psychosocial stress responses were evaluated with the PWI-SF, which was developed based on the General Health Questionnaire-60 to determine levels of psychosocial stress responses in the general population. Its reliability and validity have been established for Korean workers. Respondents score each item on a 4-point Likert scale, and scores are summed to determine the levels of psychosocial stress responses, with higher scores indicating greater stress levels [24]. Cronbach's alpha value for the PWI-SF in a previous study was 0.88 [25].

Data analysis

To test reliability, the internal consistency of the Korean Workplace PERMA-Profiler was assessed by calculating Cronbach's alpha values for the total score and individual factor scores (i.e., P, E, R, M, and A) [10].

To confirm the 5-factor structural validity of the instrument, confirmatory factor analysis (CFA) was conducted for the 15 items using robust maximum-likelihood estimation. The original 5-factor model and a 1-factor model were tested using the following model fit indices: the χ^2 test, comparative fit index (CFI), Tucker-Lewis index (TLI), root mean square error of approximation (RMSEA), and standardized root mean square residual (SRMR). We considered CFI and TLI values > 0.95 and RMSEA and SRMR values < 0.06 to indicate good model fit [26]. Pearson's coefficients (*r*) of correlation between the PERMA factors and other questionnaires including MHC-SF, KOSS-SF, UWES, MBI-GS, and PWI-SF were calculated to examine convergent and divergent validity. We used IBM SPSS AMOS version 25 (IBM Corp., New York, USA) for the analyses.

Ethics statement

The Institutional Review Board of Inje University Busan Paik Hospital exempted this study from review (no. 18-0236) because it did not involve the collection or recording of personal identifiable information and did not violate the rights of or harm of any study subject. All authors have seen and approved manuscript.

RESULTS

Participant characteristics

Table 1 shows the demographic characteristics of the participants. The majority of participants had graduated from university (65.5%) or had some college education (21.8%). Most participants were permanent workers contracted with company at least 1 years of employment (98.1%) and were engaged as office clerks (65.8%). The ages and regions of the participants were distributed evenly.

Table 1. Participant demographics (n = 316)

Characteristics	No. (%)
Gender	
Men	155 (49.1)
Women	161 (50.9)
Age	
20–29	69 (21.8)
30–39	79 (25.0)
40–49	85 (26.9)
≥ 50	83 (26.3)
City/province	
Seoul	56 (17.7)
Gyeonggi/Gangwon/Incheon	54 (17.1)
Chungbuk/Chungnam/Daejeon/Sejong	54 (17.1)
Jeonbuk/Jeonnam/Gwangju/Jeju	52 (16.5)
Gyeongbuk/Daegu	50 (15.8)
Gyeongnam/Busan/Ulsan	50 (15.8)
Job type	
Managers	24 (7.6)
Professionals and related workers	25 (7.9)
Technical and paraprofessional	25 (7.9)
Office clerks	208 (65.8)
Service workers	7 (2.2)
Sales workers	8 (2.5)
Skilled agricultural, forestry and fishery workers	3 (0.9)
Crafts and related workers	5 (1.6)
Machine operating and assembling workers	8 (2.6)
Elementary workers	3 (0.9)
Employment status[a]	
Permanent	310 (98.1)
Temporary/daily	6 (1.9)
Educational status[b]	
High school (12 or 13 years)	40 (12.7)
College (14 or 15 years)	69 (21.8)
University (16 years)	177 (56.0)
Graduate school (17 years)	30 (9.5)

[a]All employment is categorized depending on duration of his or her employment status; one or more than year as permanent, one month to a year as temporary, less than a month as daily employment; [b]We asked the participants, 'What is your highest level of education? Please indicate the total length of time that you have attended school.' The years of schooling were written in parentheses.

Internal reliability

Table 2 shows mean scores and Cronbach's alpha values for the PERMA factors. Cronbach's alpha values ranged from 0.70 to 0.95.

Structural validity

Table 3 shows the results of the CFA. Standardized covariances ranged from 0.63 to 0.89 in the 5-factors model and 0.50 to 0.87 in the 1-factor model. The 5-factor model showed marginally acceptable fit [χ^2 (80) = 383.05, CFI = 0.909, TLI = 0.881, RMSEA = 0.110, SRMR = 0.054]. The 5-factor model had a better fit than did the 1-factor model [$\Delta\chi^2$ (10) = 146.93, p < 0.05].

Convergent and divergent validity

Table 4 shows the Pearson's coefficients (r) of correlation among the PERMA factors, MHC-SF, KOSS-SF, UWES, MBI-GS, and PWI-SF. The 5 PERMA factors showed a moderate to strong positive correlation with the mental well-being in life ($0.39 \leq r \leq 0.67$ in MHC-SF), work engagement ($0.52 \leq r \leq 0.81$ in UWES), and professional efficacy subscale ($0.47 \leq r \leq 0.64$) in burnout. Meanwhile the PERMA factors showed a moderate negative correlation with the exhaustion subscale ($-0.50 \leq r \leq -0.19$) and cynicism subscale ($-0.51 \leq r \leq -0.37$) in burnout, occupational stressors ($-0.59 \leq r \leq -0.30$ in total KOSS-SF), and stress responses ($-0.62 \leq r \leq -0.30$ in PWI-SF).

Table 2. Mean scores and internal reliability (n = 316)

Factor/questions	Mean (standard deviation)	Cronbach's alpha
Positive emotion		0.88
P1: At work, how often do you feel joyful?	5.17 (2.2)	
P2: At work, how often do you feel positive?	5.95 (2.0)	
P3: At work, to what extent do you feel contented?	5.64 (2.1)	
Engagement		0.78
E1: At work, how often do you become absorbed in what you are doing?	6.94 (1.7)	
E2: To what extent do you feel excited and interested in your work?	5.48 (2.2)	
E3: At work, how often do you lose track of time while doing something you enjoy?	5.84 (2.1)	
Relationships		0.83
R1: To what extent do you receive help and support from coworkers when you need it?	6.51 (1.8)	
R2: To what extent do you feel appreciated by your coworkers?	5.73 (1.8)	
R3: How satisfied are you with your professional relationships?	6.07 (1.9)	
Meaning		0.86
M1: To what extent is your work purposeful and meaningful?	6.02 (1.9)	
M2: In general, to what extent do you feel that what you do at work is valuable and worthwhile?	6.57 (2.0)	
M3: To what extent do you generally feel that you have a sense of direction in your work?	6.32 (1.8)	
Accomplishment		0.70
A1: How often do you feel you are making progress towards accomplishing your work-related goals?	5.81 (1.8)	
A2: How often do you achieve the important work goals you have set for yourself?	6.66 (1.6)	
A3: How often are you able to handle your work-related responsibilities?	7.16 (1.5)	
Happiness, taking all things together, how happy would you say you are with your work?	5.96 (2.0)	-
Overall well-being (average of the above 16 items)	6.12 (1.4)	0.95
Negative emotion	4.68 (1.8)	0.75
N1: At work, how often do you feel anxious?		
N2: At work, how often do you feel angry?		
N3: At work, how often do you feel sad?		
Health	5.33 (1.9)	0.94
H1: In general, how would you say your health is?		
H2: How satisfied are you with your current physical health?		
H3: Compared with others of your age and sex, how is your health?		
Loneliness	4.52 (2.5)	-
How lonely do you feel at work?		

Table 3. Confirmatory factor analysis of the 15 items of the Korean version of the Workplace PERMA-Profiler

Items	Factor loadings		Correlation coefficients in the 5-factor model					
	1-factor model	5-factor model		F1 (P)	F2 (E)	F3 (R)	F4 (M)	F5 (A)
P1	0.82[a]	0.85[a]						
P2	0.79[a]	0.81[a]	F1 (P)	1.00				
P3	0.85[a]	0.89[a]	F2 (E)	0.98[a]	1.00			
E1	0.62[a]	0.63[a]	F3 (R)	0.88[a]	0.86[a]	1.00		
E2	0.87[a]	0.87[a]	F4 (M)	0.89[a]	0.99[a]	0.87[a]	1.00	
E3	0.70[a]	0.70[a]	F5 (A)	0.74[a]	0.87[a]	0.74[a]	0.89[a]	1.00
R1	0.66[a]	0.72[a]	Model fit		1-factor		5-factor	
R2	0.69[a]	0.77[a]	χ^2 (df)		529.98 (90)[a]		383.05 (80)[a]	
R3	0.79[a]	0.86[a]	CFI		0.868		0.909	
M1	0.79[a]	0.79[a]	TLI		0.846		0.881	
M2	0.82[a]	0.84[a]	RMSEA		0.125		0.110	
M3	0.79[a]	0.83[a]	SRMR		0.063		0.054	
A1	0.65[a]	0.69[a]	1-factor model vs. 5-factor model: 146.93 (10)[a]					
A2	0.50[a]	0.65[a]						
A3	0.52[a]	0.64[a]						

The robust maximum likelihood estimation method was used.
PERMA: Positive emotion, Engagement, Relationships, Meaning, and Accomplishment; P: positive emotion; E: engagement; R: relationships; M: meaning; A: accomplishment; df: degrees of freedom; CFI: comparative fit index; TLI: Tucker-Lewis index; RMSEA: root mean square error of approximation; SRMR: standardized root mean square residual.
[a]$p < 0.05$.

Table 4. Convergent and divergent validity; Pearson's correlations with other scales

Scale/factors or constructs	Mean	P	E	R	M	A	Overall
Korean Workplace PERMA-Profiler							
Positive emotion	5.59 (1.87)	1.00					
Engagement	6.09 (1.67)	0.80[a]	1.00				
Relationship	6.10 (1.60)	0.74[a]	0.68[a]	1.00			
Meaning	6.30 (1.69)	0.78[a]	0.82[a]	0.74[a]	1.00		
Accomplishment	6.55 (1.29)	0.59[a]	0.68[a]	0.56[a]	0.69[a]	1.00	
Overall well-being	6.12 (1.44)	0.91[a]	0.91[a]	0.85[a]	0.92[a]	0.78[a]	1.00
Negative emotion	4.68 (1.80)	−0.34[a]	−0.09	−0.19[a]	−0.16[a]	−0.06	−0.21[a]
Physical health	5.32 (1.88)	0.55[a]	0.45[a]	0.53[a]	0.53[a]	0.40[a]	0.57[a]
Loneliness	4.51 (2.52)	−0.16	−0.01	−0.16	0.00	−0.02	−0.09
MHC-SF	2.02 (0.85)	0.65[a]	0.57[a]	0.58[a]	0.60[a]	0.48[a]	0.67[a]
Emotional well-being	2.23 (1.04)	0.58[a]	0.50[a]	0.46[a]	0.46[a]	0.39[a]	0.56[a]
Psychological well-being	2.12 (0.92)	0.60[a]	0.53[a]	0.54[a]	0.58[a]	0.47[a]	0.63[a]
Social well-being	1.79 (0.92)	0.58[a]	0.51[a]	0.54[a]	0.54[a]	0.42[a]	0.60[a]
UWES	3.01 (1.19)	0.75[a]	0.78[a]	0.63[a]	0.75[a]	0.60[a]	0.81[a]
Vigor	2.79 (1.30)	0.75[a]	0.72[a]	0.61[a]	0.69[a]	0.52[a]	0.77[a]
Dedication	3.10 (1.25)	0.70[a]	0.74[a]	0.59[a]	0.74[a]	0.58[a]	0.77[a]
Absorption	3.16 (1.27)	0.66[a]	0.73[a]	0.58[a]	0.69[a]	0.59[a]	0.74[a]
KOSS-SF	2.47 (0.34)	−0.59[a]	−0.37[a]	−0.47[a]	−0.42[a]	−0.30[a]	−0.50[a]
Job demand	2.55 (0.58)	−0.19[a]	0.03	−0.10	−0.01	0.01	−0.07
Insufficient job control	2.42 (0.51)	−0.38[a]	−0.39[a]	−0.38[a]	−0.44[a]	−0.43[a]	−0.45[a]
Interpersonal conflict	2.33 (0.53)	−0.46[a]	−0.33[a]	−0.48[a]	−0.36[a]	−0.21[a]	−0.43[a]
Job insecurity	2.41 (0.77)	−0.34[a]	−0.19[a]	−0.14[a]	−0.19[a]	−0.11	−0.23[a]
Lack of reward	2.69 (0.59)	−0.44[a]	−0.28[a]	−0.36[a]	−0.32[a]	−0.16[a]	−0.37[a]
MBI-GS							
Exhaustion	3.25 (1.28)	−0.50[a]	−0.28[a]	−0.26[a]	−0.29[a]	−0.19[a]	−0.37[a]
Cynicism	2.61 (1.25)	−0.51[a]	−0.47[a]	−0.37[a]	−0.48[a]	−0.38[a]	−0.51[a]
Professional efficacy	3.85 (0.92)	0.47[a]	0.53[a]	0.50[a]	0.60[a]	0.64[a]	0.61[a]
PWI-SF	23.91 (8.45)	−0.62[a]	−0.44[a]	−0.45[a]	−0.47[a]	−0.30[a]	−0.50[a]
Low social performance and self-confidence	11.59 (3.92)	−0.56[a]	−0.43[a]	−0.44[a]	−0.47[a]	−0.43[a]	−0.54[a]
Depression	2.58 (1.93)	−0.47[a]	−0.31[a]	−0.36[a]	−0.38[a]	−0.30[a]	−0.43[a]
Sleep disturbance and anxiety	1.82 (1.43)	−0.40[a]	−0.21[a]	−0.25[a]	−0.26[a]	−0.26[a]	−0.32[a]
Low general well-being and vitality	7.91 (2.70)	−0.59[a]	−0.41[a]	−0.38[a]	−0.39[a]	−0.31[a]	−0.49[a]

PERMA: Positive emotion, Engagement, Relationships, Meaning, and Accomplishment; P: positive emotion; E: engagement; R: relationships; M: meaning; A: accomplishment; MHC-SF: Mental Health Continuum-Short Form; UWES: Utrecht Work Engagement Scale; KOSS-SF: Korean Occupational Stress Scale-Short Form; MBI-GS: Maslach Burnout Inventory-General Survey; PWI-SF: Psychosocial Well-being Index–Short Form.
[a]$p < 0.01$ by Pearson's correlation.

DISCUSSION

We translated the Workplace PERMA-Profiler into Korean and conducted a survey of Korean workers. In this study, the Korean version of the Workplace PERMA-Profiler demonstrated good reliability and convergent, divergent, and structural validity. Therefore, it can be used to assess multidimensional well-being in the workplace among Korean workers.

The measure showed strong internal consistency. Cronbach's alpha values for the internal consistency (reliability) of the factors ranged from 0.70 to 0.95, similar to those for the original PERMA-Profiler (0.69–0.95) [10]. The accomplishment (A) dimension had the lowest internal consistency. Among questions, the mean values of A1 and A3 responses differed the most. Korean workers are probably good at handling (A3) and achieving (A2) work-related matters, but might be less likely to feel that they are making progress towards accomplishing their work-related goals (A1).

The CFA indicated that the 5-factor PERMA model had a marginally acceptable fit [χ^2 (80) = 383.04, CFI = 0.909, TLI = 0.881, RMSEA = 0.110, SRMR = 0.054], rather than completely supporting the 5-factor structure. However, the original PERMA-Profiler (CFI =0.894, TLI =0.864, RMSEA =0.107) and Japanese Workplace PERMA-Profiler (CFI = 0.892, TLI = 0.858, RMSEA = 0.105) had similar values [10,27]. This marginally acceptable fit suggests that the 5-factor PERMA model might not be the most appropriate model measuring workplace well-being or the items might not adequately separate the 5 factors in the Korean workplace context. For example, Korean workers might consider item E2 ("To what extent do you feel excited and interested in your work?") closer to positive emotion than to engagement. Korean workers may also meet difficulties distinguishing between the concepts of meaning and accomplishment. Further research is needed to investigate how Korean workers understand each scale item using focus group interviews or other applicable methods.

Convergent validity was well supported. Work engagement showed the strongest positive correlations with this measure, especially with the PERMA-E dimension. In addition, the 3 dimensions of mental well-being in life had the strongest positive correlations with the PERMA-P dimension. These results support the postulate that mental well-being in life, work engagement, and occupational well-being are strongly correlated [28]. As engagement has been defined as the opposite experience of burnout, the burnout (exhaustion and cynicism) and engagement (vigor and dedication) scales should be negatively related [29,30]. As expected, our results showed that the core dimensions of burnout (exhaustion and cynicism) were correlated negatively with the PERMA-E dimension. In comparison, professional efficacy showed a moderate positive correlation with the PERMA-E dimension. The low degree of correlation ($r = -0.19$) between the PERMA-A dimension and exhaustion suggests that these 2 domains are not completely separated because workers might experience exhaustion in the process of work accomplishment.

The work-related psychosocial factors (insufficient job control, interpersonal conflict, and lack of reward) showed moderate negative correlations with the PERMA-P, R, and M dimensions. However, the relationships to job demands were weak. According to the job-demands resources model, well-being at work is not correlated strongly with job demands [31]. Stress responses (low social performance, depression, sleep disturbance, and low general well-being) also had moderate negative correlations with PERMA factors, except A. The PWI-SF is generally used to evaluate psychological well-being by measuring

psychological distress [24], but it could also be partially applicable to occupational well-being, based on our findings.

This study has some limitations. First, the research sample came from a pooled online panel, and selection bias might exist. Second, social desirability bias, which is the tendency of respondents to answer questions to avoid embarrassment and project a favorable image to others, could also exist. Third, the Workplace PERMA-Profiler may not measure all aspects of occupational well-being in the Korean workplace. Since the PERMA theory has been developed and validated in other countries, it may not fully reflect the Korean workplace culture differences. Despite of these limitations, there is no doubt that the Korean Workplace PERMA-Profiler is highly reliable in measuring well-being in workplace. This is the first reported set of norms for the workplace PERMA-Profiler in Korea. Since there is heterogeneity in how well-being can be defined and evaluated, well-being needs to be understood as a multidimensional construct and very different context. The Workplace PERMA-Profiler was developed in the context of occupational setting with 5 domains those help evaluate different aspects of well-being. Given the importance of occupational well-being to healthy living, we propose practical application of the Workplace PERMA-Profiler in evaluating the occupational well-being and a series of changes after psychological interventions.

CONCLUSIONS

The Korean version of the Workplace PERMA-Profiler showed good reliability and validity. It might be used as a tool to evaluate well-being in the workplace or as an indicator for positive mental health interventions at work.

ACKNOWLEDGEMENTS

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Appendix 1. The Korean Workplace PERMA-Profiler: presented one question per one screen or a full measure as part of a paper questionnaire

		0%										100%
1	당신에게 일은 얼마나 목적과 의미가 가득합니까?	전혀아님										완전히
		0 1 2 3 4 5 6 7 8 9 10										
2	당신은 업무 목표를 달성하는 과정에서 얼마나 자주 성장하고 있다고 느낍니까?	전혀아님										항상
		0 1 2 3 4 5 6 7 8 9 10										
3	당신은 얼마나 자주 직장에서 하는 일에 몰두합니까?	전혀아님										항상
		0 1 2 3 4 5 6 7 8 9 10										
4	당신의 건강에 대해 어떻게 생각합니까?	매우나쁨										최상
		0 1 2 3 4 5 6 7 8 9 10										
5	당신은 직장에서 얼마나 자주 즐거움을 느낍니까?	전혀아님										항상
		0 1 2 3 4 5 6 7 8 9 10										
6	동료들은 당신이 필요할 때 얼마나 도와줍니까?	전혀없음										완전히
		0 1 2 3 4 5 6 7 8 9 10										
7	당신은 직장에서 얼마나 자주 불안함을 느낍니까?	전혀아님										항상
		0 1 2 3 4 5 6 7 8 9 10										
8	당신은 스스로 정한 중요한 업무 목표를 얼마나 자주 달성합니까?	전혀아님										항상
		0 1 2 3 4 5 6 7 8 9 10										
9	당신은 자신이 하는 일이 얼마나 중요하고 가치있다고 생각합니까?	전혀아님										완전히
		0 1 2 3 4 5 6 7 8 9 10										
10	당신은 직장에서 얼마나 자주 긍정적으로 생각합니까?	전혀아님										항상
		0 1 2 3 4 5 6 7 8 9 10										
11	당신은 얼마나 일이 신나고 흥미진진합니까?	전혀아님										완전히
		0 1 2 3 4 5 6 7 8 9 10										
12	당신은 직장에서 얼마나 외로움을 느낍니까?	전혀아님										완전히
		0 1 2 3 4 5 6 7 8 9 10										
13	당신은 지금 당신의 신체적인 건강상태에 얼마나 만족합니까?	전혀아님										충분히
		0 1 2 3 4 5 6 7 8 9 10										
14	당신은 직장에서 얼마나 자주 화가 납니까?	전혀아님										항상
		0 1 2 3 4 5 6 7 8 9 10										
15	동료들이 당신에게 얼마나 고마워한다고 느낍니까?	전혀아님										완전히
		0 1 2 3 4 5 6 7 8 9 10										
16	당신은 얼마나 자주 맡은 일을 잘 해낼 수 있습니까?	전혀아님										항상
		0 1 2 3 4 5 6 7 8 9 10										
17	당신은 일하면서 목표가 얼마나 명확합니까?	전혀아님										완전히
		0 1 2 3 4 5 6 7 8 9 10										
18	같은 성별의 또래에 비해, 당신의 건강은 어떻습니까?	매우나쁨										최상
		0 1 2 3 4 5 6 7 8 9 10										
19	당신은 일을 하면서 만나는 사람들과의 관계에 얼마나 만족합니까?	전혀아님										완전히
		0 1 2 3 4 5 6 7 8 9 10										
20	당신은 직장에서 얼마나 자주 슬픔을 느낍니까?	전혀아님										항상
		0 1 2 3 4 5 6 7 8 9 10										
21	직장에서 좋아하는 일을 할 때, 시간이 가는 줄 모를 만큼 몰입할 때가 얼마나 자주 있습니까?	전혀아님										항상
		0 1 2 3 4 5 6 7 8 9 10										
22	당신은 직장에서 어느 정도로 만족감을 느낍니까?	전혀아님										완전히
		0 1 2 3 4 5 6 7 8 9 10										
23	모든 것을 고려했을 때, 당신은 일하는 것이 얼마나 행복합니까?	전혀아님										완전히
		0 1 2 3 4 5 6 7 8 9 10										

Appendix 2. The Korean Workplace PERMA-Profiler, grouped version: presented each group per a single page

Mobile/Web Page 1

	전혀아님 0%									항상 100%	
당신은 업무 목표를 달성하는 과정에서 얼마나 자주 성장하고 있다고 느낍니까?	0	1	2	3	4	5	6	7	8	9	10
당신은 얼마나 자주 직장에서 하는 일에 몰두합니까?	0	1	2	3	4	5	6	7	8	9	10
당신은 직장에서 얼마나 자주 즐거움을 느낍니까?	0	1	2	3	4	5	6	7	8	9	10
당신은 직장에서 얼마나 자주 불안함을 느낍니까?	0	1	2	3	4	5	6	7	8	9	10
당신은 스스로 정한 중요한 업무 목표를 얼마나 자주 달성합니까?	0	1	2	3	4	5	6	7	8	9	10

Mobile/Web Page 2

	매우나쁨									매우좋음	
당신의 건강에 대해 어떻게 생각합니까?	0	1	2	3	4	5	6	7	8	9	10

Mobile/Web Page 3

	전혀아님 0%									완전히 100%	
당신에게 일은 얼마나 목적과 의미가 가득합니까?	0	1	2	3	4	5	6	7	8	9	10
동료들은 당신이 필요할 때 얼마나 도와줍니까?	0	1	2	3	4	5	6	7	8	9	10
당신은 자신이 하는 일이 얼마나 중요하고 가치있다고 생각합니까?	0	1	2	3	4	5	6	7	8	9	10
당신은 얼마나 일이 신나고 흥미진진합니까?	0	1	2	3	4	5	6	7	8	9	10
당신은 직장에서 얼마나 외로움을 느낍니까?	0	1	2	3	4	5	6	7	8	9	10

Mobile/Web Page 4

	전혀아님									매우만족	
당신은 지금 당신의 신체적인 건강상태에 얼마나 만족합니까?	0	1	2	3	4	5	6	7	8	9	10

Mobile/Web Page 5

	전혀아님 0%									항상 100%	
당신은 직장에서 얼마나 자주 긍정적으로 생각합니까?	0	1	2	3	4	5	6	7	8	9	10
당신은 직장에서 얼마나 자주 화가 납니까?	0	1	2	3	4	5	6	7	8	9	10
당신은 얼마나 자주 맡은 일을 잘 해낼 수 있습니까?	0	1	2	3	4	5	6	7	8	9	10
당신은 직장에서 얼마나 자주 슬픔을 느낍니까?	0	1	2	3	4	5	6	7	8	9	10
직장에서 좋아하는 일을 할 때, 시간이 가는 줄 모를 만큼 몰입할 때가 얼마나 자주 있습니까?	0	1	2	3	4	5	6	7	8	9	10

Mobile/Web Page 6

	매우나쁨									매우좋음	
같은 성별의 또래에 비해, 당신의 건강은 어떻습니까?	0	1	2	3	4	5	6	7	8	9	10