

Emotional labor (KELS[®]11): scale development and validation in the Korean context

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ABSTRACT

Background: Emotional labor refers to the management of emotions and expressions to meet the emotional requirements of a job role. This study aimed to develop a revised version of the Korean Emotional Labor Scale (KELS[®]11), based on the first edition (KELS-24) introduced in 2014, and to provide practical applications and guidelines for its use in the Korean workplace through a validation process.

Methods: The revised version of KELS[®]11 was derived from the 24-item KELS, following a review process involving eight experts. To validate the scale's reliability and validity, a self-administered survey was conducted among 359 service industry workers using KELS[®]11, burnout, and depression scales. KELS[®]11 was reclassified, and its reliability and validity were evaluated. Receiver operating characteristic curve analysis was conducted to establish sex-specific cutoff values (normal vs. high-risk groups).

Results: KELS[®]11 was designed to account for individual, organizational, and cultural contexts. It consists of four subscales and 11 items: "emotional regulation" (2 items), "emotional dissonance" (3 items), "organizational monitoring" (2 items), and "organizational protective system for emotional labor" (4 items). KELS[®]11 demonstrated good validity (content validity ratio: 0.84; item convergence/discriminant validity success rates: 100%; correlation with burnout: $r = 0.185-0.436$, $p < 0.01$; correlation with depression: $r = 0.128-0.339$, $p < 0.05$) and reliability (Cronbach's alpha: 0.597-0.795). Additionally, sex-specific reference values were established to determine risk groups based on the intensity of emotional labor exposure.

Conclusions: KELS[®]11 is a validated and reliable measurement tool designed to assess the intensity and magnitude of emotional labor in the workplace. The revised tool reflects critical considerations in the development of emotional labor measurement scales.

Keywords: KELS[®]11; Validity; Reliability; Emotional labor

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BACKGROUND

Emotional labor refers to the process of managing emotions and expressions to meet the emotional demands of a job. It often involves regulating one's feelings to evoke a specific emotional response in others, as described by Hochschild.¹ This concept is particularly relevant in occupations that require high levels of interpersonal interaction, such as sales, healthcare, education, customer service, and social work. Emotional labor is a crucial component of many professions, significantly impacting workers' well-being, job performance, and organizational productivity.² Emotional labor, particularly surface acting—the act of displaying emotions that are not genuinely felt—is associated with stress stemming from the emotional dissonance between felt and displayed emotions. Over time, emotional labor can lead to increased cardiovascular strain, including elevated heart rate and blood pressure.³

Emotional labor is recognized as one of the most significant threats to mental health, as it requires workers to regulate their emotions according to the demands of their employers.^{4,5} Frequent interactions with customers can lead to prolonged displays of inauthentic emotions, resulting in chronic health issues.⁶ Consequently, emotional labor may increase the risk of psychological problems, including burnout, fatigue, and mental health conditions such as depressive symptoms and anxiety.^{2,7-9} Surface acting, in particular, is especially harmful because it often fosters feelings of inauthenticity and diminishes self-esteem.¹⁰ Workers who are subjected to chronic emotional labor frequently report lower sleep quality due to heightened stress and rumination, which can hinder recovery and exacerbate fatigue.¹¹

The measurement and evaluation of emotional labor typically involve assessing the intensity, frequency, and strategies employed in emotional regulation within the workplace, particularly in the service sector. This assessment is often grounded in Hochschild's framework, which distinguishes among surface acting, deep acting, and genuine emotional expression. This classification has shaped the conceptualization and operationalization of emotional labor across various professions. Measurement tools such as the Emotional Labor Scale (ELS)¹² offer reliable methods for assessing emotional

regulation strategies in occupational contexts. Accurate measurements enable organizations to implement strategies that mitigate adverse effects and enhance positive emotional practices in the workplace.

Since the introduction of the ELS by Brotheridge and Lee,¹² additional scales have been developed to measure emotional labor. Glomb and Tews¹³ created a conceptually grounded and psychometrically sound instrument known as the Discrete Emotions Emotional Labor Scale, that emphasizes the experience of discrete emotions. The Emotional Labor Inventory by Diefendorff et al.¹⁴ evaluates three dimensions: surface acting, deep acting, and the expression of naturally felt emotions. Researchers have further clarified the concept of emotional labor and created a series of scales applicable across various occupations and situations. For example, the Hospitality Emotional Labor Scale developed by Chu and Murrmann,¹⁵ specifically measures emotional labor within the hospitality industry. Cukur¹⁶ developed and validated the Teacher Emotional Labor Scale to evaluate emotional labor among educators. The Frankfurt Emotion Work Scale by Zapf et al.¹⁷ focuses on emotion regulation in the workplace and includes dimensions such as requirements for emotional expression and emotional dissonance. Yang et al.¹⁸ addressed four dimensions: surface acting, deep acting, genuine emotions, and emotional termination. This scale measures the extent to which service workers manipulate or alter their emotions and actively express them in specific cultural contexts. Recently, the Perth Emotional Labor Scale proposed by Clarke et al.¹⁹ evaluates emotional labor by considering factors such as attentional deployment, which refers to directing attention away from the current situation to activate the desired emotion. Yaro-sake et al.²⁰ developed an ELS to assess emotional labor among employees in the service industry.

As social problems and negative outcomes related to emotional labor continue to increase, Korean researchers have begun to focus on these issues. Chang et al.²¹ developed a Korean version of the Emotional Labor Scale (KELS-24), a 24-item measurement tool designed to assess the intensity of emotional labor while reflecting the specific organizational climate in Korea and the key dimensions of emotional labor, including deep acting, surface acting, and genuine expressions. Addi-

tionally, several items addressing organizational monitoring and protective systems against emotional labor are included in KELS-24. This is because long-lasting and repeated monitoring systems such as closed-circuit television, the deployment of surveillance agents disguised as customers, and organizational support mechanisms such as customer handling manuals and guidelines can significantly influence employees' emotions. In recent years, an increasing body of research has explored the relationship between emotional labor and health outcomes using KELS-24.^{7,22-24} However, this tool requires revision as the organizational climate in Korean workplaces has rapidly evolved due to campaigns and legislation aimed at protecting workers engaged in emotional labor. Furthermore, several studies conducted using KELS-24, as well as Delphi analysis to develop the revision, have shown that some items are redundant and others are difficult to apply to specialized occupations (e.g., non-face-to-face workers such as call center workers), and failed to accurately assess the extent of emotional labor, necessitating a more streamlined and effective tool.

The purpose of this study is to develop KELS®11, a revised version of the Korean Emotional Labor Scale, based on KELS-24. Additionally, it aims to provide practical applications and guidelines for the effective assessment of emotional labor in Korean workplaces through a validation process.

METHODS

Procedures

We conducted a literature review and held expert consultations to draft an initial version that was subsequently validated for reliability and validity. To develop a draft of the revised KELS, the authors finalized the survey items through workshops with the research team, a Delphi study, and advisory meetings. In the Delphi process, eight experts evaluated whether items should be retained, revised, or excluded. Positive responses regarding the retention or revision of an item were used to calculate the content validity ratio (CVR) for each item.²⁵ Polit et al.²⁶ recommended that items with a CVR of 0.78 or higher, based on evaluations from three or more panelists, could be considered evidence of satisfactory con-

tent validity.²⁷ The CVR was calculated using Lawshe's formula.²⁵

$$CVR = (n_e - N/2) / N/2$$

, where n_e is the number of panelists identifying an item as "essential" and N is the total number of panelists.

Using Lawshe's formula, we determined that a CVR of 0.75 or higher indicated a high level of consensus among experts. Based on this validation process, we developed the revised draft, which we named KELS®11.

Measures

To validate KELS®11, we conducted a survey targeting 359 service workers (114 males and 245 females). The survey included demographic information (sex, age, and occupation), the KELS®11, and measures for depression (using the Patient Health Questionnaire-9)²⁸ and burnout (the emotional exhaustion subscale of the Maslach Burnout Inventory).²⁹ We sampled service industry workers engaged in varying levels of emotional labor across different sectors and collected data for analysis through face-to-face surveys.

Statistical analysis

We conducted exploratory factor analysis (EFA) to investigate the factor structure of the 11 items and determine whether the data aligned with the hypothesized factors. The number of factors was identified using eigenvalues of one or higher from the correlation matrix of the observed variables. We employed orthogonal rotation via varimax to calculate factor loadings and assessed whether each survey item was grouped with its initially hypothesized factor. To evaluate model fit in the factor analysis, we calculated the Kaiser-Meyer-Olkin value, considering values above 0.90 as indicative of excellent fit. Additionally, we performed Bartlett's test of sphericity, interpreting a p -value greater than 0.05 as an indication of insufficient sample size relative to the number of items.³⁰ Criterion validity was assessed using depression and burnout as outcome variables, with the four KELS®11 factors serving as independent variables. Pearson's correlation analysis was used to calculate correlation coefficients. Convergent and discriminant validity were evaluated using a Multitrait-Multimethod

Matrix to derive correlation coefficients.³¹ Factor analysis was performed for construct validity, while correlation analysis was conducted for item discriminant and criterion validity.

To assess internal consistency (reliability), Cronbach's alpha was calculated with a value of 0.70 or higher considered indicative of high reliability among the measured items.³⁰ Finally, receiver operating characteristic (ROC) analysis was conducted to determine the sex-specific cut points (normal vs. risk) of the scale. All statistical analyses were analyzed using IBM SPSS Statistics version 23.0 (IBM Corp., Armonk, NY, USA).

RESULTS

In the present study, we aimed to revise the KELS-24, which was developed to objectively and quantitatively measure the intensity and magnitude of emotional labor in a Korean work setting through a validation process. Originally, the KELS-24 consisted of five subscales (24 items) related to emotional labor: emotional de-

mands and regulation (5 items), overload and conflict in customer service (3 items), emotional disharmony and heart (6 items), organizational surveillance and monitoring (3 items), and lack of a supportive and protective system in the organization (7 items), all measured using a 4-point Likert scale. However, some items were redundant and failed to adequately assess the intensity and magnitude of emotional labor in previous studies. Additionally, certain subscales or items could not predict outcome variables such as burnout and depressive symptoms. To address these limitations, we propose a revised version of the KELS-24 (KELS®11) developed through a four-step validation process.

Content validity

The draft of KELS®11 developed through the Delphi method and an open workshop is presented in [Table 1](#). The Korean version of KELS®11 is included in the [Supplementary Table 1](#). We restructured the questionnaire to include three subscales and 11 items based on content validity analysis: "emotional regulation" (2 items),

Table 1. Subscales and items of KELS®11^a

Item		Extremely disagree	Disagree	Agree	Absolutely agree
Emotional regulation	1. When dealing with customers, I have no choice but to express my feelings according to the company's guidelines or demands.	1	2	3	4
	2. In the course of dealing with clients at work, I hide my honest feelings.	1	2	3	4
Emotional dissonance	3. I have to deal with customers who ask for work beyond my ability or authority.	1	2	3	4
	4. When I respond to customers, I feel like I'm selling my emotions as well.	1	2	3	4
	5. I get hurt in the process of dealing with customers.	1	2	3	4
Organizational monitoring	6. I am monitored to ensure that I respond to customers as required by the company (CC TV, etc.)	1	2	3	4
	7. When there is a problem with customer service, I am treated unfairly by the company through no fault of my own.	1	2	3	4
Organizational protective system for emotional labor	8. There are formal systems and procedures in the workplace to help and solve problems that arise in the process of dealing with customers.	4	3	2	1
	9. There are behavioral guidelines or manuals in the workplace to deal with malicious customer.	4	3	2	1
	10. Behavioral guidelines and manuals for customer-facing interaction can help protect me.	4	3	2	1
	11. I have the authority and autonomy to address the needs of my customers.	4	3	2	1

KELS: Korean Emotional Labor Scale.

^aThe following questionnaire is designed to assess your level of emotional labor. Based on your current working conditions, please mark V closest to your thoughts on the survey below.

“emotional dissonance” (3 items), and “organizational monitoring and insufficient organizational protective system” (6 items). Item number 11 was included in the draft of KELS®11 because all panel members agreed that it is essential for assessing the intensity of emotional labor. To confirm the content validity, we calculated the CVR using Lawshe’s Content Validity Index and obtained a CVR of 0.84.

Construct validity

Factor analysis

To confirm the construct validity of KELS®11, we conducted an EFA using the survey dataset ($n = 359$), which included 114 males (31.8%) and 249 females (68.2%). The age distribution of the participants revealed that most were in their 30s, followed by those in their 20s, 40s, and 50s. Participants in their 20s and 30s comprised 65% of the total sample, indicating a higher proportion of younger workers.

Based on the principal component factor analysis of the 11 proposed items on the ELS, the items were initially grouped into three factors, accounting for a total variance of 62.95%. Factor 1 was reclassified into two categories: “emotional regulation” (items 1 and 2) and “emotional dissonance” (items 3, 4, and 5). Although these items were grouped based on similar components, they were deemed distinct in terms of question content. “Emotional regulation” refers to the intensity of exposure to emotional labor, whereas “emotional dissonance” represents an internal response to emotional labor. Items 8, 9, 10, and 11 were grouped together under Factor 2, while items 6 and 7 were categorized under Factor 3, which were reclassified as “organizational protective system for emotional labor” (items 8, 9, 10, and 11) and “organizational monitoring” (items 6 and 7), respectively. Ultimately, the 11-item Korean Emotional Labor Scale (KELS®11) was restructured into four subscales. All items were scored on a 1-2-3-4 Likert scale (some items were reverse-scored on a 4-3-2-1 Likert scale) (Table 2).

Convergent and discriminant validity

To evaluate convergent and discriminant validity between each item and the pre-conceptualized subscale in the final version of KELS®11, a Multitrait-Multimethod

Table 2. Results of factor analysis for KELS®11

	Factor		
	1	2	3
KELS_4	0.794	0.020	0.205
KELS_2	0.756	0.093	−0.019
KELS_1	0.748	0.094	0.051
KELS_5	0.726	0.028	0.199
KELS_3	0.680	0.051	0.362
KELS_9	−0.036	0.902	0.053
KELS_10	0.042	0.847	0.040
KELS_8	0.081	0.791	0.037
KELS_11	0.162	0.553	0.243
KELS_6	0.134	0.090	0.817
KELS_7	0.237	0.153	0.775

The bold font is the factor loading value included in the subscales.
KELS: Korean Emotional Labor Scale.

Matrix analysis was conducted. Convergent validity was considered acceptable when the correlation between each item and its corresponding factor was at least 0.40, whereas discriminant validity was established when the correlation between each item and its corresponding subscale was greater than its correlation with unrelated subscales. The success rates of the convergent and discriminant validity were calculated as the percentage of successful tests out of the total number of tests performed.

The results showed that convergent validity and discriminant validity were strong for all four subscales, with correlation coefficients (r) above 0.64 and 0.52, respectively. For all the subscales, the success rates for item convergent and discriminant validity were 100% (Tables 3 and 4).

Criterion validity

To assess the criterion validity of KELS®11, a correlation analysis was conducted between its four subscales and the outcome variables burnout and depression. The results showed that the four subscales of KELS®11 showed significant positive correlations with burnout ($r = 0.185$ – 0.436 , $p < 0.01$) and depression ($r = 0.128$ – 0.348 , $p < 0.05$) (Table 5).

Reliability

In the present study, an internal consistency method (Cronbach’s alpha) was performed to evaluate the reliability of KELS®11. As shown in Table 6, Cronbach’s

Table 3. Convergent and discriminant validity of four subscales and items of KELS®11

Subscale	No. of items	Correlation coefficient		Item convergent validity		Item discriminant validity	
		Convergent validity	Discriminant validity	No. of success	Success rate (%)	No. of success	Success rate (%)
Emotional regulation	2	0.880–0.889	0.131–0.498	2/2	100	8/8	100
Emotional dissonance	3	0.831–0.875	0.109–0.515	3/3	100	12/12	100
Organizational monitoring	2	0.819–0.870	0.201–0.410	2/2	100	8/8	100
Organizational protective system for emotional labor	4	0.642–0.871	0.028–0.245	4/4	100	16/16	100

KELS: Korean Emotional Labor Scale.

Table 4. Correlation coefficients between items and four subscales of KELS®11

Item	Emotional regulation	Emotional dissonance	Organizational monitoring	Organizational protective system for emotional labor
KELS_1	0.889	0.498	0.294	0.138
KELS_2	0.880	0.490	0.255	0.131
KELS_3	0.466	0.832	0.402	0.151
KELS_4	0.515	0.875	0.335	0.120
KELS_5	0.437	0.831	0.307	0.109
KELS_6	0.261	0.296	0.870	0.201
KELS_7	0.262	0.410	0.819	0.233
KELS_8	0.101	0.143	0.165	0.759
KELS_9	0.079	0.028	0.185	0.871
KELS_10	0.119	0.101	0.192	0.860
KELS_11	0.192	0.219	0.245	0.642

The bold font is the correlation coefficients between the total of the subscales and each item.

KELS: Korean Emotional Labor Scale.

Table 5. Correlations between four subscales of KELS®11, burnout and depression

Subscale		Burnout	Depression
Emotional regulation	Correlation coefficient	0.361	0.237
	<i>p</i> -value	<0.001	<0.001
Emotional dissonance	Correlation coefficient	0.436	0.338
	<i>p</i> -value	<0.001	<0.001
Organizational monitoring	Correlation coefficient	0.326	0.230
	<i>p</i> -value	<0.001	<0.001
Organizational protective system for emotional labor	Correlation coefficient	0.185	0.128
	<i>p</i> -value	<0.001	0.015

KELS: Korean Emotional Labor Scale.

alpha for the four subscales ranged from 0.597 to 0.795.

User guidelines and reference values for determining risk vs. normal group

In this study, reference values based on sex were proposed to evaluate the intensity of exposure to emotional labor during task performance. The reference values for determining risk groups according to the intensity of exposure to emotional labor were determined separately

for men and women and are presented in Table 7. The sex-specific cutoff values of each assessment tool were derived from the results of the ROC analysis using depression scores collected from the survey. These cutoff values were determined on the point at which the area under the ROC curve (AUC) was maximum in the ROC analysis of depression, and the cutoff points were used to present the sex-specific reference values for each subscale (Table 7).

Table 6. Cronbach's alphas for four subscales of KELS®11

Subscale	Item no.	Cronbach's alpha
KELS®11	Emotional regulation	KELS_1
		KELS_2
	Emotional dissonance	KELS_3
		KELS_4
		KELS_5
	Organizational monitoring	KELS_6
		KELS_7
	Organizational protective system for emotional labor	KELS_8
		KELS_9
		KELS_10
		KELS_11

KELS: Korean Emotional Labor Scale.

Table 7. Sex-specific cut-off values and reference values for four subscales of KELS®11

	Emotional regulation		Emotional dissonance		Organizational monitoring		Organizational protective system for emotional labor	
	Male	Female	Male	Female	Male	Female	Male	Female
Depression								
AUC	0.589	0.581	0.619	0.693	0.621	0.613	0.506	0.583
Sensitivity	82.4	37.5	100	92.5	50.0	37.5	76.5	84.8
Specificity	29.9	75.4	20.8	35.7	64.9	82.9	27.3	28.6
Cut-point	5	6	6	7	4	5	8	8
Reference values	Normal: 2–5 Risk: 6–8	Normal: 2–6 Risk: 7–8	Normal: 3–6 Risk: 7–12	Normal: 3–7 Risk: 8–12	Normal: 2–4 Risk: 5–8	Normal: 2–5 Risk: 6–8	Normal: 4–8 Risk: 9–16	Normal: 4–8 Risk: 9–16

KELS: Korean Emotional Labor Scale; AUC: area under the receiver operating characteristic curve.

DISCUSSION

Measuring emotional labor involves evaluating the effort that individuals exert to regulate their emotions to adjust to organizational or societal goals and expectations, particularly in their work environments. Some contextual considerations needed to develop an ELS are workplace setting and cultural diversity because emotional labor can vary significantly across occupations (e.g., service vs. healthcare vs. education),³² and cultural norms influence emotional display rules and emotional labor.³³ In the present study, we propose a revision of the KELS-24 that reflects the three important dimensions of emotional labor and the particularities of Korea's organizational culture.

Over the past few decades, most emotional labor scales have focused on observing changes in the labor market structure, which requires employees to have high-level attitudes toward regulating their emotions to

achieve organizational goals. Few studies have examined the chronic effects of emotional labor, especially among individuals with long-term work experience. A standardized model for the measurement and evaluation of emotional labor has not yet been found, and existing scales remain complex and multidimensional. Moreover, the application to current situations or contexts of social and cultural differences has been neglected.³⁴ Given these limitations, researchers have emphasized the importance of the ELS measure and evaluation of emotional labor in various professions and sociocultural contexts. Researchers have documented that emotion regulation and display rules for perceiving emotions differ significantly across cultures.³⁵

Two primary dimensions influence emotional labor: individual and organizational factors.^{36,37} First, from an individual perspective, emotional labor has been recognized as being associated with work experiences, personality traits, and the cultural values of employees.

Some employees may be inherently unsuitable for the emotional labor required by certain occupations,⁵ suggesting that some people adapt or conform well to the job characteristics of emotional labor, whereas others do not. Second, from an organizational perspective, many researchers have recognized that emotional labor can be effectively regulated and managed to produce a positive impact. In other words, when job autonomy³⁸ and an authentic organizational climate³⁹ are present, employees are better equipped to handle emotional dissonance. Sufficient organizational support is more likely to increase the job satisfaction of employees,⁴⁰ a positive outcome that shows a significant relationship with appropriate control or management of emotional labor.^{7,22,41,42}

The revised version of the Korean Emotional Labor Scale (KELS®11) consists of 11 items in four subscales: “emotional regulation” (2 items), “emotional dissonance” (3 items), “organizational monitoring” (2 items), and “organizational protective system for emotional labor” (4 items). “Emotional regulation” evaluates the degree to which emotion regulation is required when interacting with customers, as well as the level of demand and regulation for the duality and diversity of emotional expressions. “Emotional dissonance” assesses the degree of emotional damage or hardship experienced by emotional labor workers, such as hurt feelings or self-esteem, due to conflicts with customers or a lack of discretion in the process of dealing with customers. “Emotional regulation” is not merely a measure of intensity; rather, it refers to the process of modifying one's emotions to align with organizational expectations. In contrast, “emotional dissonance” pertains to the psychological strain arising from the mismatch between felt and displayed emotions. For example, “emotional regulation” is when workers have to hide their emotions when responding to customers who demand excessive services and have no choice but to respond according to the rules of the workplace, while “emotional dissonance” is when workers perceive that they feel humiliated or hurt their self-esteem in the process of responding to excessive service demands.

“Organizational monitoring” examines whether workers respond properly to customers and assesses the extent to which they unilaterally apply this to personnel

reviews or evaluations. The “organizational protective system for emotional labor” evaluates the degree to which organizational management is implemented when problems arise in the process of dealing with customers and the level of support systems in the workplace that can alleviate these problems.

In the present study, sex-specific reference values were presented to evaluate the intensity of exposure to emotional labor and to determine the normal or at-risk group because exposure and intensity of emotional labor appear to differ depending on sex. A growing body of literature has documented that the intensity of emotional labor differs by sex.^{1,43-46} For example, Brody and Hall⁴⁷ reported that women are often expected to display more nurturing and caring emotions, while men may be expected to suppress emotions such as vulnerability. Also, exposure and outcome of emotional labor such as poor mental health differs by sex. Suh and Punnett⁴⁸ reported that the risk of poor mental health was higher for men than for women. Sex-specific cutoff values were obtained based on the results of the ROC analysis of depression scores.

KELS®11 is designed to reflect two dimensions: the emotional state of employees themselves, which is experienced by both customers and the organization. This point is also deeply related to the characteristics of Korea's organizational culture rooted in Confucianism, as well as the occupational outlook, such as the disregard for service jobs. These cultural factors distinguish Korean emotional labor from Western workplace cultures, leading to key differences in emotional labor measurement tools. Social attitudes toward service jobs or workers are strongly influenced by cultural values such as hierarchy, respect for authority, and formality. These values manifest themselves in a variety of ways, including the expectation of courteous and efficient service to employees compared to other professions, which often differs from the obvious friendliness common in Western countries. According to a study by Kong and Jogaratnam,⁴⁹ these organizational cultural differences have a significant impact on how service interactions are perceived and performed. Service jobs are often more formal and can be attributed to broader social norms of moderation and conservatism, a difference that contrasts with the more casual and personal approach typ-

ical of service interactions in the West.⁵⁰ This hierarchy and organizational culture influence the interaction between service workers and customers. Service workers have a tacit consensus and a tendency to take for granted that they should show respect for customers who are considered higher in the social hierarchy. The slogans of the companies such as "customer is king," "until customer satisfied," and "customer line" are proof of this tendency. In addition, the collectivist nature of Korean culture emphasizes group harmony and conformity, leading service workers to prioritize the needs of the group over individual expression, which leads to a more introverted attitude. However, Western cultures, which tend to be individualistic, differ in that they encourage personal expression, making friendliness more explicit in the service interactions. These characteristics provide important clues as to how Korea's emotional labor differs from that of the West. In view of this, we included organizational dimensions such as organizational monitoring and the emotional labor protection system in KELS®11.

KELS®11 has several strengths. First, KELS®11 is a measurement tool that can objectively evaluate the intensity of emotional labor experienced by customer-facing workers at a geometric level that reflects the three core dimensions of emotional labor as well as Korean organizational culture. Second, KELS®11 is a standardized measurement tool derived from reliability and validity analysis, which can quantitatively evaluate the emotional labor intensity of customer-facing workers. Third, KELS®11 acknowledges that the intensity of emotional labor differs by sex and provides sex-specific cutoff reference values.

Despite these strengths, KELS®11 has some limitations. First, some validity and reliability problems may be raised due to its relatively low AUC and Cronbach's α values. This limitation could be addressed and supplemented through feasibility evaluation from the nationwide surveys ($n = 5,000$) through stratified sampling of sex, age, and occupational groups in order to secure more reliable and valid measurement tools and to provide sex-specific reference cut-off points in the future. Second, we used the Patient Health Questionnaire-9 (PHQ-9) as the gold standard for emotional labor to establish depression, which has been proven to be related

to emotional labor. However, this approach may overlook the possibility that other stressors may confound the relationship between emotional labor and depression, and a high level of emotional labor doesn't make everyone suffer from depression. Therefore, there is a methodological limitation in classifying emotional labor risks using the depression screening tool such as PHQ-9.

As a result, the proposed KELS®11 could be used as a standardized tool to objectively and quantitatively measure the intensity of emotional labor of customer-facing workers by confirming the validity and reliability of test results. The KELS is expected to be used as a measurement tool to prepare and implement policies to reduce stress caused by emotional labor in the workplace, and it can be used as a tool for pre- and post-evaluation to understand the performance of these policies. Intervention strategies to improve emotional labor must be combined with individual and organizational interventions to achieve meaningful change.

CONCLUSIONS

This study demonstrated that KELS®11 is a valid and reliable measurement tool to objectively and quantitatively assess the intensity and magnitude of emotional labor. The revised scale incorporated important considerations in its development process and was designed to ensure its applicability across individual, organizational, and cultural contexts. KELS®11 was designed to address the limitations in the original KELS-24, improving the clarity and precision of its items. The findings indicate that KELS®11 exhibits strong validity and reliability, making it a robust and practical tool for evaluating emotional labor intensity. Further research is needed to confirm the validity and reliability of KELS®11 and to elucidate the causal relationships between emotional labor and various health outcomes (physical, mental, and occupational).

NOTES

Abbreviations

AUC: area under the receiver operating characteristic curve; CVR: content validity ratio; EFA: exploratory factor analysis; ELS: Emotional Labor Scale; KELS: Korean

Emotional Labor Scale; PHQ-9: Patient Health Questionnaire-9; ROC: receiver operating characteristic.

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Competing interests

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Author contributions

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SUPPLEMENTARY MATERIAL

Supplementary Table 1. KELS®11 subfactors and questionnaires.

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