Assessing Employees' Positive Functioning at Work: Adaptation and Validation of the PERMA + 4 Scales into Turkish

İbrahim Demirci[1] · Özlem Keskin[1]

Abstract

Employees' well-being and psychological functioning in the workplace are crucial factors that influence both their productivity in professional life and their overall well-being in personal life. This study aims to adapt the PERMA+4 Positive Functioning at Work Scales, which comprehensively and multidimensionally assess individuals' well-being at work, into Turkish and to examine their psychometric properties. As part of the study, the long-form scale with 29 items and the short-form scale with 9 items were translated and adapted into Turkish. The study sample consisted of 297 individuals employed in various occupations. Confirmatory factor analysis revealed that the long form's nine-factor (Positive Emotion, Engagement, Relationships, Meaning, Accomplishment, Health, Mindset, Environment, and Economic Security) and the short form's unidimensional structure had acceptable levels of model fit. Item response theory-based evaluations of the short form revealed that the items had enough discriminative power, confirming the validity of its unidimensional structure. Internal consistency and test-retest reliability coefficients for both forms of the scale were found to be at acceptable levels. Correlations between the PERMA+4 Positive Functioning at Work Scales and the PERMA Scale provided evidence of convergent validity. The PERMA+4 Scales can be applied in scientific studies conducted in Türkiye and could be a useful instrument for figuring out what factors affect employees' motivation and well-being at work, as well as for organizing and assessing interventions meant to improve workplace well-being and positive functioning.

Keywords PERMA model · PERMA+4 · Well-being · Workplace positive functioning · Scale adaptation · Positive organizational psychology

Extended author information available on the last page of the article

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The pursuit of sustainable organizational success has prompted a paradigmatic shift toward a more holistic framework, wherein employees are evaluated not solely based on performance outcomes but also in terms of their well-being. With the influence of the Positive Psychology (PP) movement on the workplace, factors such as employees' happiness, motivation, resilience, and well-being have started to be recognized as critical for both career success and organizational success. Positive Organizational Psychology (POP) is a modern field of organizational psychology that applies the principles and research of PP to workplace settings. While traditional organizational psychology has often focused on areas such as stress, burnout, inefficiency, and failure, POP emphasizes employees' well-being, resilience, satisfaction, commitment, and the factors that drive motivation. In this context, there is a need for valid and reliable measurement tools to assess employees' well-being. The aim of this study is to adapt the PERMA+4 Positive Functioning at Work Scale and the PERMA+4 Short Scale, developed to evaluate employees' workplace well-being and psychological functioning, into Turkish and to examine their psychometric properties.

Focusing on the positive attributes and strengths of human psychology, Positive Psychology (PP) has introduced various models related to well-being in the literature. One of these models is Seligman's multidimensional PERMA well-being model, which consists of the components of Positive Emotion, Engagement, Relationships, Meaning, and Accomplishment (Seligman, 2011, 2018). Donaldson et al. (2022) adapted Seligman's classical well-being model to the workplace context by expanding its scope to include additional dimensions relevant to workplace well-being. In addition to Positive Emotion, Engagement, Relationships, Meaning, and Accomplishment, they introduced Physical Health, Mindset, Workplace Environment, and Economic Security, developing the PERMA+4 model. During the development of PERMA+4, criticisms of PP (Zyl et al., 2023) were considered, and a more comprehensive and evidence-based approach was established (Cabrera & Donaldson, 2023), ensuring an objective and holistic perspective.

Positive psychology is a subfield of psychology that examines individuals' positive traits, virtues, well-being, and functioning (Seligman & Csikszentmihalyi, 2000). Although being a relatively new topic of study, positive psychology has origins in humanistic psychology. The positive facets of human experience, potential, strengths, and personal growth are the main topics of both fields. This shared foundation is indicated by the fact that Maslow, one of the pioneers of humanistic psychology, used the phrase "positive psychology" in his own writings and that individuals such as Carl Rogers were interested in quantitative research (Rich, 2017). While positive psychology presents itself as a new and distinct movement, its thematic content and theoretical assumptions significantly overlap with those of humanistic psychology (Robbins, 2008). At times, positive psychology contradicts the core principles of humanistic psychology, which emphasize the individual's intrinsic capacity for growth, by steering individuals through interventions aimed at changing them in the direction defined as "optimal" by the practitioner. It is criticized for focusing on solving problems by enhancing individual strengths while neglecting systemic issues. As a person-centered approach, humanistic psychology, which is a historical precursor to positive psychology, emphasizes not only how individuals can change themselves but also how they can change their social environments (Joseph, 2021). The PERMA

model has drawn criticism for its individualistic viewpoint, lack of cultural sensitivity, and exclusion of environmental aspects, despite the fact that it offers a valuable foundation for comprehending personal well-being (Donaldson et al., 2022; Zyl et al., 2023). In response, the PERMA+4 model incorporates elements such as physical health, mindset, work environment, and economic security, addressing well-being not only in psychological but also in social, cultural, and structural contexts (Donaldson et al., 2022; Cabrera & Donaldson, 2023). According to the PERMA+4 model, each sub-dimension constitutes a critical component of workplace well-being (Donaldson et al., 2022; Cabrera & Donaldson, 2023):

- Positive Emotions: Refers to employees experiencing happiness, enjoyment, hope, and satisfaction in the workplace.
- Engagement: Encompasses employees being fully immersed in their work, focusing on their tasks with high interest and experiencing a state of flow.
- Relationships: Represents the strengthening of employees' commitment to their workplace through supportive social relationships and strong bonds.
- Meaning: Involves employees finding their work meaningful and feeling that their efforts contribute to a larger purpose.
- Accomplishment: Covers employees achieving their goals, feeling successful at work, and receiving recognition for their efforts.
- Physical Health: Refers to employees' fitness, energy levels, and overall health status, as well as physical conditions that support productivity in the workplace.
- Mindset: Involves employees being open to growth and believing they can develop their skills through effort and learning.
- Work Environment: Includes employees' perceptions of the physical conditions in the workplace, as well as access to elements that enhance cognitive performance, such as natural light, nature, and other environmental factors.
- Economic Security: Represents employees' financial stability and the adequacy of their future financial security.

The integration of these workplace dimensions provides the PERMA+4 model with a comprehensive perspective, making it particularly adaptable to the complex demands of modern work environments. The individual accomplishment and happiness-focused framework of positive psychology is enhanced by the creative, critical, and socially conscious approach of humanistic psychology, which makes it possible to evaluate well-being both at the individual level and in a larger societal context. This synthesis strengthens both the scientific and humanistic dimensions of psychology, paving the way for a more inclusive understanding (DeRobertis & Bland, 2021). With its emphasis on environmental factors, the PERMA+4 model offers a more holistic perspective.

In today's workplaces, various studies have examined the effects of practices aimed at analysing and effectively guiding human resource potential and psychological capacity, which are measurable, improvable, and manageable, on employees' attitudes and behaviours (Donaldson et al., 2021; Keleş, 2011). A review of the literature reveals that work life fulfils various psychological needs beyond financial earnings. Spending long hours at the workplace (Oruç, 2019) and engaging in work-

related communication with colleagues (Ören & Yüksel, 2012) indirectly provide a social environment and psychological satisfaction, directly influencing individuals' well-being. For this reason, Positive Psychology's focus on human strengths and positive attributes has found its place in workplace research. Göçen (2019) states that in recent years, psychological studies have increasingly focused on the development of individuals' positive characteristics, and research emphasizing the meaning of life has begun to attract attention in the literature. Psychological well-being plays a guiding role in individuals' professional lives. This approach has led to a deeper examination of personal ideas from an organizational viewpoint, including psychological well-being, psychological capital, and meaning in life. Indeed, strengthening employees' positive emotions in the workplace, as well as enhancing their sense of meaning and well-being, is believed to have therapeutic and beneficial effects against negative or destructive emotional states.

In Türkiye, various scale development and adaptation studies have been conducted in this field. These studies primarily focus on variables that indirectly affect employees' well-being, such as incivility (Kutlu & Bilgin, 2017; Keçeci & Turgut, 2018; Gök et al., 2019), violence (Tutan & Kökalan, 2023), bullying (Aydın & Öcel, 2009), exclusion (Kurum & Erdemli, 2022), attitudes toward individuals with disabilities (Mamatoğlu et al., 2015), interpersonal conflict (Aytaç & Başol, 2018), psychological harassment (Tınaz et al., 2010), social courage behaviour (Uysal & Bayramoğlu, 2022), and cyberbullying (Kayman, 2017; Karabatak & Alanoğlu, 2020). Among the scales that directly measure workplace well-being, the Employee Well-Being Scale (Güzel & Mamatoğlu, 2024) consists of three dimensions: life well-being, workplace well-being, and psychological well-being. Another scale, the Strategies for Enhancing Subjective Well-Being at Work Scale (Eryılmaz & Ercan, 2016), includes the sub-dimensions of establishing positive relationships with the environment, fulfilling religious beliefs, satisfying desires, and maintaining mental control. Although these scales focus on workplace-related factors, there remains a need for more comprehensive measurement tools that thoroughly evaluate workplace well-being. In this context, the PERMA+4 Positive Functioning at Work Scale is expected to fulfil a significant gap in the field.

1 Psychometric Properties of the Positive Functioning at Work (PERMA + 4) Scales

The dimensionality of the PERMA+4 Scale was examined through Exploratory Factor Analysis conducted on the 58-item pool, which resulted in a 27-item structure encompassing nine factors. This nine-factor solution, with each subscale consisting of three to four items, was refined further. Two items within the work environment factor showed unacceptably low loadings and were thus revised for the Confirmatory Factor Analysis (CFA). At the conclusion of the study, a 29-item scale consisting of nine factors. In analyses conducted to examine the factor structure of the PERMA+4 Scale, the nine-factor model emerged as the most prominent. This model assumed that PERMA+4 Scale comprises nine interrelated but distinct dimensions that do not stem from a single higher-order construct, and it demonstrated a strong fit with

the data as indicated by robust statistical indices. In contrast, a first-order hierarchical model positing a single overarching structure encompassing the nine dimensions was also tested. Although this model showed an acceptable fit, the nine-factor model demonstrated superior fit. These findings suggest that PERMA+4 Scale has a multidimensional structure comprising nine interrelated but distinct components, rather than reflecting a single general factor. In internal consistency analyses, Cronbach's alpha coefficient for the overall PERMA+4 Scale was 0.94. Among the subscales, alpha values ranged from 0.66 (environment) to 0.93 (positive emotions), with the environment subscale demonstrating relatively lower reliability. McDonald's hierarchical omega coefficient was 0.83 for the overall PERMA+4 Scale, while subscale values ranged from 0.69 (environment) to 0.93 (positive emotions), indicating how well each dimension explained its own unique variance (Donaldson & Donaldson, 2021).

The short form of the PERMA+4 Scale was developed using Item Response Theory (IRT). The analyses demonstrated that this 9-item short form possesses a high level of discriminative power. The item difficulty parameters also fall within acceptable limits. Scale information function analysis revealed that the 9-item short version provides a comparable amount of information to the original 15-item version. Notably, items related to Positive Emotions, Engagement, Meaning, and Accomplishment were identified as the most informative elements of the scale. These findings support the validity and reliability of the PERMA+4 Short Scale as an effective tool for measuring positive functioning in the workplace (Donaldson et al., 2023).

The PERMA+4 model represents a multidimensional state of well-being by incorporating Positive Emotions, Engagement, Relationships, Meaning, and Accomplishment, which directly influence an individual's well-being, along with Physical Health, Mindset, Work Environment, and Economic Security, which are considered to have a direct impact on workplace well-being. Studies comparing the psychometric properties of the PERMA Scale and its workplace-adapted version suggest that modifications in the scale's content, when transitioning from a general context to a workplace-specific context, may affect the measurement model and structural equivalence; however, the scale can still maintain strong psychometric properties (Rice, 2024). The PERMA+4 Scale has started to be adapted to various cultures. For instance, the German version (Lorenz et al., 2023) and the Spanish version (García-Selva et al., 2024) of the PERMA+4 Positive Functioning at Work Scale have demonstrated strong validity and reliability in capturing the multidimensional nature of positive workplace functioning. The Russian adaptation of the PERMA+4 short form yielded acceptable results (Smolyanov & Guriev, 2025). The purpose of this study was to adapt and validate both the long (29 items) and short (9 items) versions of the PERMA+4 Short Scale in Turkish, as well as to investigate their psychometric qualities within Turkish culture. The study's scope included answers to the following research questions.

RQ1 Is the factor structure of the Turkish version of the PERMA+4 Positive Functioning at Work Scale consistent with the original scale?

RQ2 What is the internal consistency reliability of the scale?

RQ3 What is the test-retest reliability of the scale?

RQ4 What is the relationship between the Turkish version of the PERMA+4 Scale and the PERMA-Profiler?

RQ5 To what extent does the scale predict scores on the PERMA-Profiler?

RQ6 What are the item discrimination parameters of the PERMA+4 Short Scale according to IRT?

2 Method

2.1 Participants

The study group consists of employees aged 18 and above, residing in various cities across Türkiye. Participants were recruited on a voluntary basis after responding to an announcement about the study on different platforms. Before participation, informed consent was obtained. A total of 297 employees completed the demographic information form, the PERMA-Profiler, and the Turkish-adapted long (29-item) and short (9-item) versions of the PERMA+4 Scale. In terms of demographic characteristics, participants' ages ranged between 18 and 63 years ($N=297$, M=37.87, SD=9.39). Most of the participants were women ($n=170$, 57.2%), single ($n=192$, 64.6%), graduates of undergraduate or associate degree programs ($n=212$, 71.4%), and public sector employees ($n=215$, 72.4%). The proportion of male participants was 42.8% ($n=127$), while married participants made up 35.4% ($n=105$). Educational background distribution included high school or primary education graduates ($n=33$, 10.6%) and postgraduate degree holders ($n=52$, 17.5%). The private sector workforce accounted for 27.6% ($n=82$) of the sample. Regarding work tenure, 23.6% ($n=70$) had less than 5 years of experience, 19.9% ($n=59$) had 6–10 years, 22.2% ($n=66$) had 11–15 years, 12.8% ($n=38$) had 16–20 years, 21.5% ($n=64$) had more than 20 years of experience. To calculate test-retest reliability coefficients, the inventory was re-administered to a subgroup of 46 participants (19 men and 27 women, aged 20–57; M=39.83, SD=8.96) after a three-week interval.

2.2 Instruments

PERMA+4 Positive Functioning at Work Scale The Positive Functioning at Work Scale was developed and validated to assess the nine elements of the PERMA+4 Model. (Donaldson, 2019; Donaldson & Donaldson, 2021). The scale consists of 29 self-report items. The Physical Health and Relationships subdimensions contain four items each, while the remaining subdimensions consist of three items each. Research findings indicate that the scale demonstrates good model fit in both the first-order nine-factor model and the second-order hierarchical model. Additionally, the instrument exhibits convergent, discriminant, predictive, and incremental validity and maintains measurement invariance across different workplace contexts (Donald-

son & Donaldson, 2021). The scale follows a 7-point Likert format, ranging from 1 (Strongly Disagree) to 7 (Strongly Agree). There are no reverse-scored items. In this study, Cronbach's alpha coefficient was found as 0.927.

PERMA + 4 Short Form The 9-item short form of the PERMA+4 Scale was developed to address the need for a valid and concise instrument for measuring workplace well-being. It was created using IRT (Donaldson et al., 2023). In this version, each subdimension is represented by a single item, resulting in a one-dimensional, 9-item scale. Unlike the long version, the response format is a 0–10 scale, ranging from 0 (Not at all) to 10 (Completely Agree). In this study, Cronbach's alpha coefficient was found as 0.902.

PERMA-Profiler The PERMA-Profiler was developed by Butler and Kern (2016) and adapted into Turkish by Demirci et al. (2017). It was designed to assess Seligman's five-dimensional model, which includes Positive Emotions, Engagement, Relationships, Meaning, and Accomplishment. The scale consists of 15 items, with three items per dimension. Each dimension is scored separately by calculating the mean scores of its corresponding items. Additionally, the scale includes eight filler items: three measuring feelings of well-being, three assessing negative emotions, one measuring loneliness, and one evaluating general well-being. The authors of the scale recommend using the 23-item form, as it provides valuable additional information. For the total well-being score, they suggest including the Happiness item (p23) in addition to the five subdimensions. The scale is scored on a 0–10 Likert scale, ranging from 0 (Not at all) to 10 (Completely agree). In this sample, CFA results incorporating the Health subdimension into the model indicate a good model fit: $\chi^2(120) = 282.614$, $p < .001$, $CFI = 0.938$, $NNFI = 0.920$, $RMSEA = 0.068$ (90% CI: 0.059, 0.076), $SRMR = 0.046$. In this study, Cronbach's Alpha internal consistency coefficients for the subdimensions were found as follows: Positive Emotions: 0.897, Engagement: 0.757, Relationships: 0.783, Meaning: 0.822, Accomplishment: 0.739, Health: 0.919, The Cronbach's alpha coefficient for overall well-being was calculated as 0.952.

2.3 Personal Information Form

In this study, a Personal Information Form was utilized to collect participants' demographic information, including gender, age, marital status, education level, occupation, tenure, and workplace details.

2.4 Translation and Adaptation of the Scales into Turkish

For the adaptation of the PERMA+4 Scales (long form: 29 items; short form: 9 items) into Turkish, the research team contacted Stewart I. Donaldson, the original developer of the scale, via email, and official permission was obtained. The translation-back translation method was employed in the adaptation process. The scale was first translated into Turkish by three experts in the field, with special attention given to ensuring that the items remained consistent with the original scale while also being

culturally and linguistically appropriate for the Turkish population. Following this, two bilingual experts reviewed both the English and Turkish versions, discussing necessary linguistic and semantic refinements. The revised Turkish version was then back-translated into English by two independent experts, after which the research team carefully examined the back-translated version, making final modifications to ensure semantic equivalence with the original. To further assess clarity and comprehension, the items were read aloud to five participants in a cognitive interview process, where their feedback was noted, and necessary revisions were made to enhance clarity and accuracy. For example, during the cognitive interviewing process, one participant stated, "Considering the economic conditions in our country, the phrase 'I feel economically secure' seems somewhat ambiguous to me. I may not feel secure, but I could maintain my economic stability even if I didn't receive a salary for a few months." Following this feedback, the item was reviewed and revised. In this way, items that were found to be unclear based on participant feedback were updated accordingly. Finally, a pilot study was conducted with 50 participants to evaluate the clarity and comprehensibility of the items, and after reviewing the item analysis results and confirming the scale's suitability, the main data collection phase was initiated.

2.5 Procedure

Participants were recruited through WhatsApp groups and email lists. Participants were first provided with detailed information regarding the purpose of the study. The invitation emphasized the voluntary nature of participation and the importance of contributing to the validation of a psychological assessment tool. The scales were administered through Google Forms, and informed consent was obtained from all participants before data collection. Completing the form took approximately 10 min. For the test-retest procedure, participants who consented to follow-up were given anonymous identifiers. After a 3-week interval, they were contacted via email and asked to complete the same scale again using their identifier.

2.6 Data Analysis

Once data collection was completed, the obtained data were organized on a computer for statistical processing. The analyses were conducted using the JASP (JASP Team, 2024) and JAMOVI (The jamovi Project, 2024) software package. To investigate the psychometric qualities of the PERMA+4 Scale, a CFA was conducted to confirm the factor structure developed by Donaldson and Donaldson (2021) and to determine its suitability for the Turkish cultural context. Since the items did not exhibit a normal distribution, the Maximum Likelihood Robust (MLR) estimation method, which is commonly used for ordinal data, was applied. To assess the model fit in the confirmatory factor analysis, the Chi-Square Goodness-of-Fit Test (χ^2), Comparative Fit Index (CFI), Tucker–Lewis Index (TLI), Standardized Root Mean Square Residual (SRMR), and Root Mean Square Error of Approximation (RMSEA) were used (Kline, 2016). The criteria for acceptable model fit were $\chi^2/df \geq 2$, $CFI \geq 0.90$, $NNFI \geq 0.90$, RMSEA and $SRMR < 0.08$, while good model fit was determined by $\chi^2/$

df≥5, CFI≥0.95, TLI≥0.95, RMSEA and SRMR<0.05. When comparing models, those with lower Akaike Information Criterion (AIC) and Expected Cross-Validation Index (ECVI) values were preferred (Çokluk et al., 2014; Hoyle, 1995; Han & McGrath, 2023; Şimşek, 2020; Sümer, 2000).

For construct validity, the skewness values were between −1.74 and 0.04, and kurtosis values ranged from −0.88 to 3.13. The skewness values for the test-retest correlation coefficient of the scale scores ranged from −1.16 to 5.63, while kurtosis values ranged from −2.22 to 0.19. These results indicate that the data followed a normal distribution (Kline, 2016).

The convergent validity of the scale was examined by analysing the correlations between the Positive Functioning at Work Scale and the PERMA-Profiler. After the correlation analysis, the predictive power of the PERMA+4 Scale (both long and short forms) on PERMA well-being scores was tested. First, the regression assumptions for the prediction of PERMA well-being scores by the PERMA+4 Long Form subdimensions were examined. The multicollinearity statistics (tolerance values ranging from *0.418* to *0.849* and VIF values between *1.178* and *2.393*) indicate that there is no severe multicollinearity issue in the model. The Durbin-Watson statistic (*1.927*, *p=*.527) suggests that there is no significant autocorrelation among residuals. The Q-Q plot showed that residuals mostly followed a normal distribution; however, an influential observation (192) that caused a substantial deviation from normality was removed. After its removal, the data met the assumptions for regression analysis. The regression assumptions for the prediction of PERMA well-being total score by the PERMA+4 Short Form were checked. The multicollinearity statistics (tolerance=*1.000*, VIF=*1.000*) indicate no multicollinearity concerns. The Durbin-Watson statistic (*1.883*, *p=*.310) suggests no significant autocorrelation among residuals, while the Q-Q Plot revealed that the residuals had a normal distribution.

In addition to Classical Test Theory (CTT), IRT was applied to evaluate the validity of individual items. The Graded Response Model (GRM), which is suitable for Likert scales, was used in the IRT analysis. Item discrimination (α) and item difficulty (b) parameters were calculated. According to Baker (2001), an α value below 0.64 indicates low discrimination, values between 0.65 and 1.34 indicate moderate discrimination, and values above 1.35 suggest high discrimination. Regarding item difficulty, higher b values indicate that an item performs well for individuals with high workplace well-being, whereas lower b values indicate that an item is effective for individuals with low workplace well-being (Baker, 2001). The GRM was used as it is suitable for the Likert scale format of the questionnaire.

3 Results

3.1 Construct Validity

As part of the CFA, six different models were tested to examine the factor structure of the scale. First, the baseline model (Model 1), which included 29 items and 9 subdimensions, was tested. Then, based on modification index suggestions, error covariances were added between item pairs i21-i23, i9-i10, and i28-i29 within the

same subdimensions, forming Model 2. In Model 3, an alternative structure was tested, in which all 9 subdimensions were grouped under a single higher-order "well-being" factor. To further improve the model, the same four item pairs were allowed to covary, resulting in Model 4. For the construct validity of the short form, Model 5 was tested, if all 9 items loaded onto a single factor. Finally, based on modification index suggestions, an error covariance was introduced between item pair i1-i5, creating Model 6. These models were designed to explore the structural validity of both the long and short forms of the scale by incorporating different structural modifications. The fit indices for the CFA results are presented in Table 1.

The comparison of models indicated that Model 2 was the best-fitting model, while Model 4 also demonstrated acceptable fit indices. An examination of Model 2's factor loadings revealed that the item factor loadings ranged from 0.495 to 0.917, whereas in the second-order CFA (Model 4), item factor loadings varied between 0.504 and 0.981. In this second-order model, the factor loadings of the subdimensions were 0.859 for Positive Emotions, 0.722 for Engagement, 0.817 for Relationships, 0.747 for Meaning, 0.808 for Accomplishment, 0.723 for Health, 0.827 for Mindset, 0.751 for Work Environment, and 0.368 for Economic Security. To further assess the properties of the scale, item-total correlations were examined, revealing coefficients ranging from 0.44 to 0.84 across the subdimensions. Similarly, in the short form (Model 6), factor loadings ranged from 0.37 to 0.85, while item-total correlation coefficients varied between 0.37 and 0.76. The detailed descriptive statistics, item-rest correlations, and standardized factor loadings for each item are presented in Table 2. The second-order CFA (Model 4) path diagram presented in Fig. 1.

Table 1 Goodness-of-Fit indices for the CFA models

Index	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
χ^2	645.837	569.799	711.606	635.481	59.440	42.431
df	341	338	368	365	27	26
χ^2/df	1.89	1.68	1.93	1.74	2.20	1.63
CFI	0.912	0.933	0.901	0.922	0.962	0.981
NNFI	0.895	0.920	0.891	0.913	0.949	0.973
RMSEA (%90 CI)	0.055 (0.049, 0.061)	0.048 (0.042, 0.054)	0.056 (0.051, 0.062)	0.050 (0.044, 0.056)	0.064 (0.046, 0.081)	0.046 (0.025, 0.066)
SRMR	0.066	0.053	0.072	0.061	0.041	0.038
ECVI	3.335	3.040	3.433	3.140	0.440	0.353
AIC	20226.970	20139.246	20256.155	20168.945	6259.785	6233.835
BIC	20574.181	20497.538	20503.636	20427.507	6326.272	6304.016

Note. Estimation method: Maximum Likelihood Robust (MLR). Model test is Yuan–Bentler with robust Huber–White standard errors. CFI = Comparative Fit Index; TLI = Tucker–Lewis Index; RMSEA = Root Mean Square Error of Approximation; SRMR = Standardized Root Mean Square Residual; ECVI = Expected Cross-Validation Index; AIC = Akaike Information Criterion; BIC = Bayesian Information Criterion. Model 1: Baseline model with 29 items and 9 subdimensions. Model 2: Model 1 with error covariances added between item pairs i21-i23, i9-i10, and i28-i29 within the same subdimensions. Model 3: Model where 9 factors are grouped under a higher-order "workplace well-being" factor. Model 4: Model 3 with error covariances added between item pairs i21-i23, i9-i10, and i28-i29 within the same subdimensions. Model 5: Short-form model with 9 items loading onto a single factor. Model 6: Model 5 with error covariance added between items 1 and 5

Table 2 Descriptives, Item-rest correlations and standardized factor loadings of PERMA+4 scales

Scales	Items	Mean	SD	Item-rest correlation	Standardized Factor Loadings	Std. error	z-value
Positive emotion	1	5.259	1.465	0.631	0.701	0.043	16.186
	2	5.731	1.364	0.785	0.846	0.041	20.401
	3	5.825	1.476	0.699	0.858	0.024	35.145
Engagement	4	6.091	1.069	0.545	0.740	0.049	15.115
	5	6.421	1.044	0.569	0.787	0.051	15.350
	6	5.333	1.544	0.447	0.505	0.067	7.507
Relationships	7	6.071	1.243	0.556	0.657	0.050	13.186
	8	5.428	1.436	0.665	0.798	0.039	20.529
	9	5.380	1.468	0.740	0.702	0.052	13.513
	10	4.929	1.477	0.748	0.753	0.048	15.815
Meaning	11	6.094	1.296	0.827	0.884	0.043	20.431
	12	6.152	1.260	0.836	0.913	0.027	33.231
	13	5.970	1.364	0.796	0.837	0.039	21.442
Accomplishment	14	5.475	1.400	0.605	0.718	0.051	14.177
	15	5.721	1.222	0.755	0.880	0.031	27.953
	16	5.882	1.170	0.600	0.719	0.064	11.303
Health	17	5.391	1.357	0.638	0.699	0.047	14.942
	18	5.175	1.605	0.690	0.719	0.039	18.640
	19	5.458	1.442	0.712	0.815	0.047	17.357
	20	5.448	1.347	0.783	0.886	0.027	33.407
Mindset	21	5.936	1.174	0.478	0.763	0.051	15.049
	22	5.418	1.509	0.701	0.762	0.041	18.470
	23	4.673	1.783	0.522	0.736	0.046	15.876
Environment	24	5.185	1.635	0.441	0.791	0.047	16.911
	25	5.391	1.760	0.545	0.551	0.072	7.646
	26	4.956	1.983	0.557	0.525	0.074	7.121
Economic security	27	3.418	1.933	0.558	0.981	0.108	9.100
	28	3.077	2.082	0.771	0.567	0.083	6.798
	29	3.290	1.962	0.725	0.504	0.090	5.597
PERMA+4 Short Form	1	7.081	2.372	0.762	0.829	0.028	29.285
	2	7.337	2.455	0.792	0.851	0.024	36.070
	3	7.835	2.261	0.652	0.702	0.044	16.085
	4	7.774	2.451	0.730	0.793	0.032	24.739
	5	7.357	2.164	0.699	0.790	0.032	24.487
	6	7.145	2.309	0.646	0.690	0.040	17.358
	7	5.916	2.840	0.714	0.708	0.037	19.375
	8	6.916	2.649	0.653	0.688	0.041	16.619
	9	3.963	3.112	0.372	0.367	0.049	7.497

Note. SD=Standard Deviation, Std. error=Standard error

3.2 Reliability

The reliability analyses of the scale demonstrated that the McDonald's ω and Cronbach's α values for the subdimensions were as follows: Positive Emotions (0.847, 0.841), Engagement (0.720, 0.715), Relationships (0.784, 0.839), Meaning (0.909,
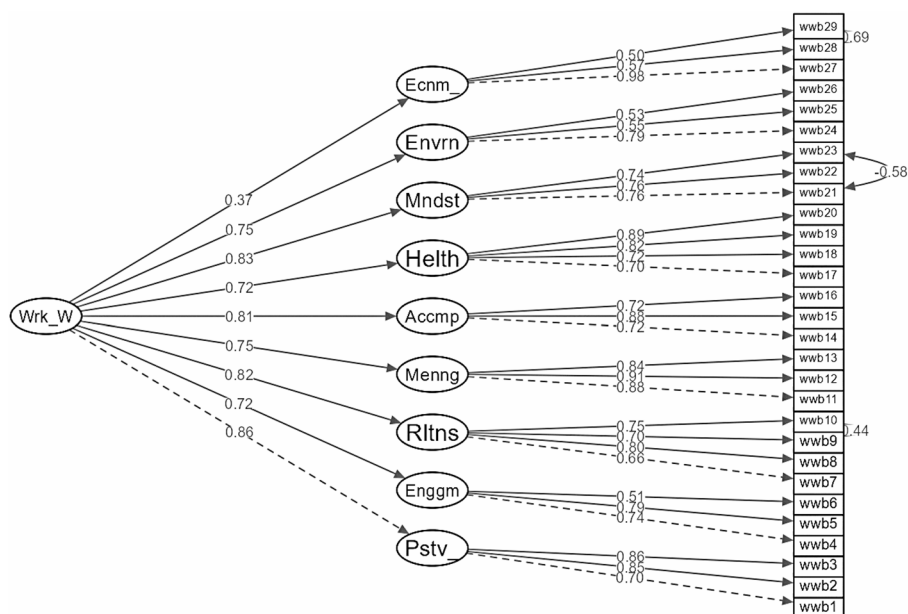
Fig. 1 Path Diagram for the PERMA+4 Scale. Note: This figure illustrates the second-order CFA model of the Workplace Well-Being Scale (Wrk_W), including its nine latent factors: Economic Security (Ecnm), Environment (Envm), Mindset (Mndst), Health (Helth), Accomplishment (Accmp), Meaning (Menng), Relationships (Rltns), Engagement (Enggm), and Positive Emotion (Pstv)

0.910), Accomplishment (0.828, 0.806), Health (0.863, 0.860), Mindset (0.865, 0.738), Work Environment (0.624, 0.694), and Economic Security (0.633, 0.823). Additionally, the total reliability scores for the PERMA+4 Scale and PERMA+4 Short Scale were 0.957, 0.933 and 0.909, 0.902, respectively. These values indicate that the variables exhibit an acceptable level of reliability. Examining the test-retest reliability coefficients, the reliability scores were found to be 0.701 for Positive Emotions, 0.689 for Engagement, 0.744 for Relationships, 0.780 for Meaning, 0.695 for Accomplishment, 0.700 for Physical Health, 0.774 for Mindset, 0.656 for Work Environment, and 0.621 for Economic Security. Furthermore, the test-retest correlation for the total score of the scale was 0.895, while the short form exhibited a test-retest reliability of 0.824. These findings suggest that the scale demonstrates an overall acceptable level of reliability. The results are presented in Table 3.

3.3 Convergent Validity

The findings indicate strong and significant correlations between similar dimensions of the PERMA+4 Model and the PERMA Model. Specifically, Health ($r=.406$), Positive Emotions ($r=.616$), Relationships ($r=.580$), Meaning ($r=.531$), Accomplishment ($r=.598$), and Engagement ($r=.406$) all showed significant positive correlations. Additionally, there were high positive correlations between the PERMA Scale and both the PERMA+4 Long Form ($r=.743$) and the PERMA+4 Short Form ($r=.839$). These findings suggest that the dimensions within the PERMA model are

Table 3 Reliability analyses of the PERMA+4 scale and PERMA+4 short scale

Scales	Coefficient ω	Coefficient α	Test-Retest Coefficient
Positive emotion	0.847	0.841	0.701
Engagement	0.720	0.715	0.689
Relationships	0.784	0.839	0.744
Meaning	0.909	0.910	0.780
Accomplishment	0.828	0.806	0.695
Health	0.863	0.860	0.700
Mindset	0.865	0.738	0.774
Environment	0.624	0.694	0.656
Economic security	0.633	0.823	0.621
PERMA+4	0.957	0.933	0.895
PERMA+4 Short Form	0.909	0.902	0.824

Note. Coefficient ω=McDonald's Omega coefficient; Coefficient α=Cronbach's Alpha coefficient

Table 4 Descriptive statistics and correlations of PERMA and PERMA+4 factors

PERMA+4	Mean	SD	PE	EN	RE	ME	AC	HE	WB
			PERMA Factors						
Positive emotion	16.81	3.75	0.616**	0.613**	0.544**	0.568**	0.568**	0.549**	0.643**
Engagement	17.85	2.91	0.351**	0.406**	0.343**	0.386**	0.387**	0.308**	0.412**
Relationships	21.81	4.64	0.482**	0.488**	0.580**	0.446**	0.458**	0.432**	0.531**
Meaning	18.22	3.61	0.511**	0.506**	0.485**	0.531**	0.531**	0.440**	0.564**
Accomplishment	17.08	3.22	0.476**	0.554**	0.453**	0.519**	0.598**	0.478**	0.566**
Health	21.47	4.83	0.567**	0.519**	0.500**	0.496**	0.483**	0.711**	0.568**
Mindset	16.03	3.64	0.468**	0.508**	0.464**	0.543**	0.562**	0.498**	0.559**
Environment	15.53	4.25	0.425**	0.386**	0.467**	0.381**	0.414**	0.341**	0.457**
Economic security	9.78	5.14	0.302**	0.241**	0.293**	0.316**	0.304**	0.309**	0.335**
PERMA+4	154.58	24.72	0.677**	0.671**	0.669**	0.669**	0.684**	0.662**	0.743**
PERMA+4 Short Form	61.32	16.76	0.780**	0.749**	0.715**	0.775**	0.772**	0.738**	0.839**

Note. SD=Standard Deviation, ** $p<.01$, PE=Positive emotion, EN=Engagement, RE=Relationships, ME=Meaning, AC=Accomplishment. HE=Health, WB=PERMA Well-Being

consistently aligned with and supportive of the broader concept of workplace well-being. Consequently, it can be concluded that the PERMA components are strongly and coherently related both among themselves and with overall workplace well-being. The detailed results are presented in Table 4.

The regression model predicting PERMA well-being scores from the PERMA+4 Scale subdimensions was found to be significant, as supported by ANOVA results ($F_{(9,286)}=52.006$, $p<.001$). The PERMA+4 Positive Functioning at Work Scale subdimensions explained 62.1% of the variance in PERMA well-being ($R^2 = 0.621$, Adjusted $R^2 = 0.609$). The Durbin-Watson statistic was 1.85, indicating no significant autocorrelation. Examining the standardized regression coefficients (β), the strongest predictors were Positive Emotions ($\beta=0.209$, $p<.001$) and Physical Health ($\beta=0.201$, $p<.001$). Meaning ($\beta=0.179$, $p=.001$), Accomplishments ($\beta=0.125$, $p=.017$), Economic Security ($\beta=0.118$, $p=.003$), and Environment ($\beta=0.107$, $p=.013$) also had significant positive effects on the dependent variable. However, Relationships ($\beta=0.051$,

$p=.309$), Engagement ($\beta=0.061$, $p=.165$), and Mindset ($\beta=0.072$, $p=.183$) did not have a statistically significant effect on PERMA well-being. Similarly, the regression model predicting PERMA well-being total score from the PERMA+4 Short Form was also significant, as supported by ANOVA results ($F_{(1, 295)}=701.931$, $p<.001$). The model explained 70.4% of the variance in the dependent variable ($R^2 = 0.704$, Adjusted $R^2 = 0.703$). Examining the standardized coefficient (β), PERMA+4 was found to have a strong and positive effect on PERMA well-being ($\beta=0.839$, $p<.001$).

3.4 Item Response Theory

According to Table 5, which presents the GRM item parameters, the item discrimination parameters range from *0.66* (ips9) to *3.66* (ips2). This finding indicates that, except for item 9, all items exhibit high discrimination. The discrimination parameter for item 9 was found to be at a moderate level (Baker, 2001). The item difficulty parameters show a meaningful distribution depending on the item content. However, the difficulty parameters for item 9 display a different pattern compared to other items. While the lower response options are relatively easy, the higher response options are significantly more difficult than those of the other items.

According to the item information functions presented in Fig. 2, the Positive Emotions, Engagement, Meaning, and Accomplishments items provide the most test information in relation to the total PERMA+4 score, whereas the Economic Security item provides the least test information.

4 Discussion

This study examined the psychometric properties of the Turkish adaptation of the PERMA+4 Positive Functioning at Work Scale, including both its long form (Donaldson & Donaldson, 2021) and short form (Donaldson et al., 2023). The findings indicate that the scale serves as an effective tool for assessing employee well-being in the workplace. The results demonstrate that the 9-factor structure of the long form and the single-factor structure of the short form exhibit an acceptable level of model fit and internal consistency coefficients. These findings align with previous studies

Table 5 Item response theory estimates of PERMA+4 short scale

Item	α	b_1	b_2	b_3	b_4	b_5	b_6	b_7	b_8	b_9	b_{10}
ips1	2.72	-2.65	-2.22	-1.89	-0.16	-0.13	-0.85	-0.58	-0.08	0.68	0.1
ips2	3.66	-2.52	-1.95	-1.86	-1.53	-1.24	-0.83	-0.5	-0.15	0.3	0.78
ips3	2.09	-3.71	-2.68	-2.53	-2.07	-1.78	-1.31	-0.85	-0.45	0.1	0.6
ips4	2.85	-2.57	-2.38	-1.89	-1.59	-0.15	-1.04	-0.79	-0.45	0.08	0.48
ips5	2.39	-2.88	-2.55	-2.38	-1.97	-0.16	-1.07	-0.62	-0.15	0.59	1.12
ips6	1.86	-0.39	-2.94	-2.5	-0.2	-1.5	-0.94	-0.5	0.01	0.65	0.1
ips7	2.02	-2.1	-1.8	-1.52	-0.12	-0.77	-0.28	0.05	0.51	1.04	1.4
ips8	1.98	-2.66	-2.3	-1.91	-1.54	-1.25	-0.81	-0.47	-0.08	0.58	1.14
ips9	0.66	-2.28	-1.53	-0.79	-0.21	0.3	1.29	1.77	2.53	3.75	4.81

Note. a=discrimination; b=difficulty; $N=297$
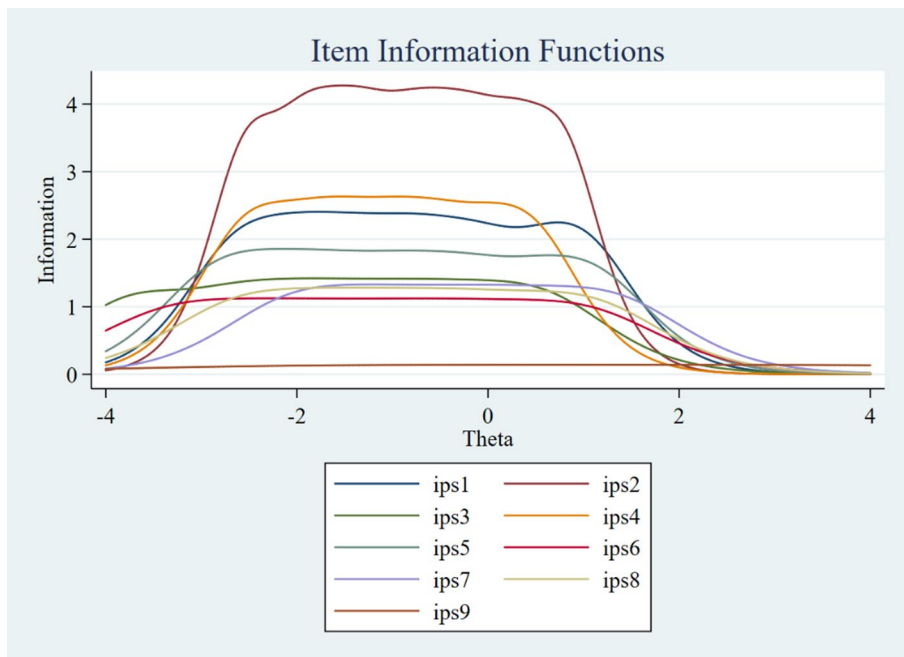
Fig. 2 Item Information Function for the PERMA+4 Short Scale. Note: This figure displays the item information functions for each item (ips1 through ips9) within the PERMA+4 Short Scale. The X-axis represents Theta (θ) values, which indicate levels of workplace well-being in employees. The Y-axis, labelled "Information," indicates the amount of information each item provides at a given Theta level. The peaks of the curves signify the points at which each respective item contributes the most information and is most discriminating in measuring workplace well-being

conducted in different cultural contexts (Donaldson & Donaldson, 2021; García-Selva et al., 2024; Lorenz et al., 2023), further supporting the strong psychometric properties of the scale.

According to the CFA results, the fit indices of Model 2 and Model 4, which were obtained by adding error covariances based on modification suggestions, indicated a better model fit with the data. This suggests that items 21–23, 9–10, and 28–29 might have been interpreted similarly by participants due to their conceptual similarities. The second-order factor analysis results further demonstrated that the nine subdimensions significantly predicted the overall positive functioning construct. The fit indices were within acceptable ranges, confirming that the nine-factor structure of the scale was valid for this study sample as well. Regarding the short form, Model 6, which included an error covariance between items 1 and 5, exhibited better fit with the data. This suggests that success and positive emotions are closely related concepts in the workplace.

Examining the factor loadings, it is noteworthy that in the second-order CFA, the Economic Security subdimension had the lowest factor loading compared to other subdimensions. Similarly, in the short form, the lowest factor loading was observed for item 9, which represents economic security. This finding revealed that the relationship between economic security and positive functioning at work in Türkiye

might differ from other dimensions. Additionally, during the data collection period, the annual consumer inflation rate was reported as 44.38% by the Turkish Statistical Institute (2025) and 83.4% by the Inflation Research Group (2025). The high inflation rates may have been perceived as a threat to economic security, influencing participants' responses. The current economic challenges in Türkiye—such as high inflation and job insecurity—may lead participants to interpret the Economic Security items in a more critical or subjective manner. This cultural-economic perspective could explain the relatively low factor loading observed in this dimension. Such considerations should be considered in cross-cultural comparisons and applications. However, the Economic Security dimension similarly showed the lowest factor loading in the German version (Lorenz et al., 2023) of the PERMA+4 Scale. This comparison suggests that the low factor loading may not be attributable solely to economic conditions but rather indicates that the perception of economic security is a multidimensional construct that warrants deeper consideration.

According to IRT parameters, the low discrimination index of item 9 in the short form suggests that this item may not be as effective as the others in distinguishing individuals with high and low levels of workplace positive functioning. Additionally, the difficulty parameters of this item exhibit a different pattern compared to the others. As a result, the IRT analysis provides important information into the psychometric properties of the PERMA+4 Short Form. Specifically, the low discrimination and distinct difficulty pattern of item 9 (ips9) should be examined more closely. These findings may be considered to enhance the overall quality and validity of the scale.

The reliability coefficients obtained for both the long and short forms indicate that the scale has acceptable internal consistency. When analysing the subdimensions, it is observed that Environment and Economic Security have relatively lower reliability scores. According to Streiner (2003), Cronbach's α is influenced by the number of items, and since the subdimensions contain only 3–4 items, the internal consistency coefficient may have remained between 0.60 and 0.70. Moreover, the test-retest reliability coefficients confirm that the scale provides consistent measurements over time (Cicchetti, 1994). Examining the item analyses, the item-total correlations are found to be at an acceptable level (Büyüköztürk, 2024). Overall, these results demonstrate that the reliability properties of the scale are satisfactory.

In the convergent validity study, consistent with previous research (Donaldson & Donaldson, 2021; García-Selva et al., 2024; Lorenz et al., 2023), a significant positive relationship was found between PERMA+4 Scales and the PERMA-Profiler. This result aligns with prior expectations, confirming that these scales measure closely related and mutually influential constructs. When examining the correlations between the PERMA+4 Scale and the PERMA-Profiler, high levels of correlation are observed. A review of studies investigating the relationship between the PERMA+4 Scale and the PERMA-Profiler indicates that in the German adaptation of the scale (Lorenz et al., 2023), the correlation between the total scores of the two scales was found to be at a similar level. However, no study has yet examined the relationships between the subdimensions of the PERMA+4 and the PERMA-Profiler. Although the PERMA model is theoretically multidimensional, previous research has shown high intercorrelations among its components (e.g., Bartholomaeus et al., 2020; Butler & Kern, 2016; Demirci et al., 2017; Martín-Díaz & Fernández-Abascal, 2024). Our

findings are consistent with this pattern. Future research could benefit from investigating whether this overlap reflects conceptual convergence or measurement limitations. Further studies are also needed to enhance the discriminant validity between the subdimensions of the PERMA+4 Scale and the PERMA-Profiler.

4.1 Limitations and Future Research

Although this study offers insightful information about the scale's validity and reliability, it has certain limitations. First, the sample consists of a specific group, which may not fully represent different occupational groups, industries, or cultural contexts. Testing the scale on larger and more diverse populations might improve its generalizability. Second, the convergent validity was examined only in relation to the PERMA Scale. While the PERMA+4 demonstrates acceptable validity as a measure of employee well-being and positive functioning, future research may explore its associations with performance-related outcomes and psychological variables to enhance understanding of its practical applications in organizational settings. Third, some subdimensions of the scale have relatively lower internal consistency coefficients. This may suggest that certain items are interpreted differently across different occupational groups or that some subdimensions require further validation on larger samples. Future studies could strengthen these findings by testing the scale on broader samples, across different industries and professions, and by comparing white-collar and blue-collar workers using various methodological approaches.

The PERMA+4 Scale can be integrated into human resources processes to identify employees' strengths and areas for development, detect deficiencies in specific PERMA+4 dimensions, design interventions aimed at enhancing well-being and motivation, and foster a positive work environment. The scale can be applied pre-test and post-test to measure the effectiveness of training and development programs designed to improve employees' positive functionality. Additionally, it can be implemented through anonymous surveys to gather feedback on employees' workplace experiences and identify areas for improvement. For example, HR departments in institutions across Türkiye could implement the PERMA+4 model in periodic employee satisfaction surveys to monitor trends in well-being. High scores in the Meaning and Relationships dimensions may indicate a strong team culture, while low scores in Positive Emotions and Flow may signal the need for stress reduction programs or initiatives aimed at enhancing employee engagement. In cases where time and resources are limited, the 9-item short form can serve as a practical indicator of overall well-being in workplace applications. However, for a more detailed assessment, the long-form version is recommended.

When comparing different language adaptations of the PERMA+4 model, it is evident that the Turkish version demonstrates generally strong psychometric properties in both its long and short forms. Regarding the long form of the nine-factor PERMA+4 model, both the Turkish and Spanish versions (García-Selva et al., 2024) showed acceptable model fit. Following three modifications based on suggestions from the modification indices, the Turkish version demonstrated an improved fit as expected. In the second-order factor model, both the German (Lorenz et al., 2023) and Turkish adaptations provided good model fit. Similarly, the Turkish version of the

second-order factor model, with modifications, yielded better fit indices compared to the German version (Lorenz et al., 2023). In terms of reliability, while the Cronbach's Alpha and McDonald's Omega coefficients reported for the Spanish version (García-Selva et al., 2024) were generally higher than the minimum values obtained for some factors of the Turkish version, both adaptations exhibited an overall acceptable level of internal consistency. However, the test-retest reliability of the Turkish version offers an additional source of robustness. In the comparison of short forms, the Turkish adaptation displayed notably superior model fit and higher internal consistency compared to the Russian version (Smolyanov & Guriev, 2025). These comparisons highlight that both the long and short Turkish forms of PERMA+4 share similar structural characteristics with other cultural adaptations, underscoring the suitability and psychometric robustness of the Turkish PERMA+4 Scales for research and practical applications in the Turkish population. While the core structure of PERMA+4 remains valid across these different linguistic and cultural contexts, the varying factor loadings observed in second-order models highlight the importance of understanding cultural characteristics in how well-being components manifest and are prioritized.

When examining workplace well-being research in Türkiye, studies have focused on various aspects of employee well-being. For example, Doğan and Eryılmaz (2012) explored the relationship between basic psychological need satisfaction and subjective well-being among academics; Küçük and Çakıcı (2018) examined the impact of workplace incivility on subjective well-being; Akbaş Tuna and Boylu (2016) investigated how perceived organizational support and affective well-being influence counterproductive work behaviours; and Taşpınar and Eryeşil (2021) analysed the impact of organizational trust on psychological well-being and workplace loneliness. Moreover, Donaldson et al. (2022, 2024) emphasized that POP interventions could serve as a comprehensive assessment tool to help identify the needs of students, employees, managers, and organizations, as well as guide the design and evaluation of interventions. Research on workplace well-being in Türkiye is still in its developmental phase, with growing recognition of its importance in professional life. Investigating the applicability of PERMA+4's nine subdimensions in Turkish workplaces and their impact on employee well-being could yield valuable insights for both academic literature and corporate practices.

5 Conclusion

This study provides valuable contributions to the assessment of workplace well-being by examining the psychometric properties of the Turkish adaptation of the PERMA+4 Scales. The findings support the suitability of the PERMA+4 model within the Turkish workplace context, offering a solid basis for future research and interventions targeted at improving employee well-being. The PERMA+4 measurement tool can be effectively utilized in POP studies conducted in Türkiye, facilitating further research on workplace well-being and its practical applications.

Data Availability The dataset used in this article is openly available in the OSF repository at https://osf.io/ca3u2.

Declarations

Ethics Approval Ethics approval for the study was obtained from the University Human Research Ethics Committee. Informed consent was obtained from all participants. The study was conducted in accordance with the principles of the 1964 Declaration of Helsinki.

Competing Interests The authors declare no competing interests.

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Authors and Affiliations

İbrahim Demirci[1] · Özlem Keskin[1]

✉ Özlem Keskin
 ozlemztp@gmail.com

 İbrahim Demirci
 ibrahimdemircipdr@gmail.com

[1] Department of Psychological Counseling, Faculty of Education, Sinop University, Sinop, Türkiye