Article

Rasch and Confirmatory Factor Analyses of the Arabic Version of the Psychological Empowerment Scale (PsyES): A Multicultural Approach for Measurable Sustainability

Hadi Dhafer Hassan Kariri [1,*], Hassan Edrees Somaili [1], Mohammed EL-Sayed Ibrahim Mansour [1], Ali Hadi Omair [1] and Omaymah Abdulwahab Radwan [2]

1 Department of Psychology, College of Education, Jazan University, Jazan 45142, Saudi Arabia
2 Department of Education, College of Education, Jazan University, Jazan 45142, Saudi Arabia
* Correspondence: hakariry@jazanu.edu.sa

Abstract: This research is focused on the well-known notion of workplace motivation known as psychological empowerment and how this may be used regarding sustainability. This research aimed to use Rasch and confirmatory factor analyses to examine the multidimensionality, reliability, and model fit of the Arabic version of the psychological empowerment scale (PsyES). A total of 579 male and female employees participated in this study. The participants were from the Jazan region, Saudi Arabia. PsyES's four constructs (meaning, competence, self-determination, and impact) and their dimensionalities were confirmed using Rasch and AMOS analyses. A total of 323 women (55.8%) and 256 men (44.2%) provided data. Most respondents were married (74.8%), followed by those who were never married (21.1%), divorced (3.1%), and widowed (1.0%). The final multidimensional scale model adequately fits the data (chi-square/df (cmin/df) = 3.55, comparative fit index = 0.97, root mean square error of approximation = 0.066, and standardized RMR = 0.035) according to the AMOS results. This multidimensional nature of PsyES was further confirmed using the Rasch model. The person and item separation indices were more than 1.5, and the Rasch analysis revealed 39 persons with a misfit. The modified rating scale's functioning was confirmed by the item characteristic curve. The MnSq and Zstd values did not deviate from the two recognized limits or indicate that the data were consistent with the Rasch model based on the recommended indicators. This is the first study of its kind to find PsyES useful as a screening tool for psychological empowerment in its Arabic version. Its four dimensions are a valid and reliable measurement tool that can be used in many measurable areas of sustainability.

Keywords: measurable sustainability; psychological empowerment; Arabic version; validity; Rasch model; AMOS

1. Introduction

There is a growing body of research that investigates the reasons and motivations behind employee participation in corporate social responsibility (CSR) as well as employees' responses to it. Workers are encouraged to exhibit more of their complete personalities at work when they are in what is known as a psychologically safe frame of mind. This has a positive association with the perception of organizational support, which in turn has a positive correlation with corporate social responsibility. The value of work purpose is established by the meaning that it holds in terms of sustainability measured against a person's sustainability standards or ideals. It is an indication that workers want the opportunity to implement their commitment to sustainable practices in their jobs. The concept of psychological empowerment has already been applied in micro-CSR research [1–3].

There is a link between psychological empowerment and ill health, as indicated by both theoretical and empirical evidence [4]. By enhancing psychological safety and psychological empowerment [5–7], it is possible to prevent resource depletion cycles from occurring.

As a result, the emotional exhaustion experienced by workers will be alleviated. In the negative relationship between psychological empowerment and emotional exhaustion, the concept of psychological safety plays a significant role. According to Sjöblom, K. et al. [5], psychological empowerment enables employees to experience better connections with other people or activities and realize that other areas of their life and the situation they are working in are compatible [5]. The organizational embeddedness of an employee is considerably improved via psychological empowerment. In terms of a fit, empowered workers find greater significance in their job; they have a strong sense that their personal values and beliefs align with those of their employers. Employees that are psychologically empowered also feel autonomous. Their initiative demonstrates this by initiating and continuing work procedures [8] that motivate people to remain. Moreover, empowered individuals believe that their efforts will generate positive results because of an increased sense of competence.

Psychological empowerment is the expression of internal motivation in terms of the four cognitive components of meaning, competence, self-determination, and impact [9]. How effectively an employee's values and beliefs align with the requirements of their profession is reflected in the meaning [9]. Self-efficacy, a concept derived from social cognitive theory, pertains to people's beliefs in their capacity to exercise control over events that affect their lives [10]. Self-determination refers to a person's confidence in their ability to start and control their work activities [11]. In conclusion, the four cognitive elements demonstrate an active orientation and a sense of control towards work. According to the concept of psychological empowerment, empowered workers have a more positive attitude regarding their work. This demonstrates an approach in which workers desire and demonstrate confidence in customizing their job's role and surroundings [9]. Consequently, empowerment and intrinsic motivation can lead to improved forms of job performance.

Psychological empowerment is linked to bad health, according to theory and research. Assessing psychological empowerment has been applied in the healthcare field. A correlation between psychological empowerment and health outcomes was found in a study of nurses from the United States [12] and Saudi Arabia [13]. The influence that research on psychological empowerment has on the performance of workers in any industry, as well as on their emotional and physical health, is one of the reasons why this topic of study is so important. Even though there is a valid, reliable, and tried-and-true measurement in many nations and a few languages [4,7,12–16], the validity of the psychological empowerment scale (PsyES) in the context of the Arab social structure has not been examined. Mubarak and his colleagues devised an Arabic scale for Saudi women. However, it is intended for one sex and contains twenty-six items, making it difficult to answer [17]. In light of this, the purpose of this research is to investigate the validity and reliability of a measure of PsyES using a sample population that varies in terms of age, socioeconomic position, educational attainment, work status, and geographical location. The Rasch model and confirmatory factor analysis utilizing the Winstep and Amos programs, respectively, are two examples of the more complex methods of analysis that may be utilized to accomplish this goal.

2. Materials and Methods

2.1. Study Design and Sample Size

A cross-sectional design based on the population was chosen. The responses to the questionnaire from the respondents were gathered via random sampling. Ten persons per item are advised as the sample size for Rasch analyses [18]. According to simulation studies, N = 150 is a suitable sample size for a CFA model with normally distributed variables and no missing data [19]. A total of 579 participants from Saudi Arabia's government departments made up the research sample. Data were gathered from the Saudi Arabian province of Jazan.

2.2. Data Collection and Measures

In the months of June 2021 and July 2022, this study was carried out. This study's results were gathered via the use of a self-administered questionnaire. The information was gathered electronically. To best fit the participants, the survey was conducted in Arabic. The questionnaire produced information on demographic factors, including sex and marital status. It was optional to take part in this study. The age range of the participants was between 21 and 75 years old (M = 34, SD = 13). The second part of the questionnaire contained a measure of the psychological empowerment scale (PsyES) translated into Arabic. PsyES (Table 1) was translated into Arabic by this study's team, after which it was reviewed by a qualified Arabic translator. Two different researchers reviewed the information to ensure its content validity. Respondents were asked to rate how much they agreed with each statement on a Likert scale that ranged from 5 (strongly agree) to 1 (strongly disagree). Higher scores showed that the person was psychologically empowered.

Table 1. Psychological empowerment scale (12 items).

Abbreviation	Items	Subscales
PsyEM1	The work that I do is important to me.	
PsyEM2	The work I do is meaningful to me.	Meaning
PsyEM3	My job activities are personally meaningful to me.	
PsyEM4	I am confident about my ability to do my job.	
PsyEM5	I am self-assured about my capabilities to perform my work activities.	Competence
PsyEM6	I have mastered the skills necessary for my job.	
PsyEM7	I have significant autonomy in determining how I do my job.	
PsyEM8	I can decide on my own how to go about doing my own work	Self-determination
PsyEM9	I have significant autonomy in determining how I do my job.	
PsyEM10	My impact on what happens in my department is large.	
PsyEM11	I have a great deal of control over what happens in my department.	Impact
PsyEM12	I have significant influence over what happens in my department.	

2.3. Rasch Analysis

The Rasch analysis used in this study adhered to Linacre's recommendations [18]. Winsteps software version 5.2.2.0 was employed for Rasch analysis. Good indicators of the overall fit included a non-significant chi-square and a mean (MnSq) for the item and person residuals close to zero. Items with threshold disorders were searched for using threshold maps and response category curves. The residuals outside the range of 2.5 were regarded as a misfit when considering the item and person statistics. The person separation index (PSI) was used to check internal consistency, and a value of 0.7 or higher was found [20]. The scale's dimension was also scrutinized. The internal validity of the PsyEMS was examined using principal component analysis. Examining item fit statistics and running a principal component analysis of the residuals can determine the degree of dimensionality. For an instrument to be considered unidimensional, the first component must account for more than half of the total variance. The item's hierarchy decides how difficult a task will be based on a person's aptitude. Along a measurement continuum, the Rasch model calculates item locations (calibrations). Scale item severity is ranked by item calibration. Rasch's model demonstrates how well items fit into a group. The log-odds units (logits) used to describe item calibration indicated the difficulty of the items by virtue of their larger magnitude. The ideal participant distribution matched the ideal item distribution. In this study, an item map and a continuum were used to assess item difficulty. This is referred to as a Wright Map. Rasch person and item measurement data are shown. The same logit scale is used to plot both the person and item measurements. With the aid of a Wright Map, a researcher can examine the distribution of items, respondents' locations, and test takers' performance using the test items' collection to explain the test takers' abilities.

2.4. AMOS Software

With the aid of IBM-AMOS 24, confirmatory factor analysis (CFA) was used to verify the PsyES factor structure. The root mean square error of approximation (RMSEA), adjusted goodness of fit index (AGFI), chi-squared/df (cmin/df), goodness of fit (GFI), comparative fit index (CFI), and PCLOSE were used to evaluate the AMOS-based model [21]. Covariance between unobserved variances was achieved using modification indices (e1–e12) in accordance with the recommendation of the software.

2.5. Ethical Consideration and Consent

The investigation was carried out in accordance with standard procedures in the scientific community. This work was given the green light by the Departmental Ethical Committee of Jazan University. On 3 January 2021, this project was assigned the DPCE:1/2/458 approval code by the department. Every participant was given a written explanation of this study's goals, informed that their participation was entirely voluntary, and informed that their anonymity and the confidentiality of their responses would be protected. Each participant, once they had received all essential information, signed a consent form.

3. Results

3.1. Sample Characteristics

Data were collected from 579 people, including 256 males (44.2%) and 323 women (55.8%). Most respondents were married (74.8%), followed by those who had never been married before (21.1%), divorcees (3.1%), and widows (1.0%). Further details are depicted in Table 2.

Table 2. Sample characteristics.

Variable	Women		Man		Total	
	N	**%**	**N**	**%**	**N**	**%**
Marital Status						
Single	72	12.4	50	8.6	122	21.1
Married	228	39.4	205	35.4	433	74.8
Divorced	18	3.1	0	0.0	18	3.1
Widow	1	5	1	0.2	6	1.0
Total	323	55.8	256	44.2	579	100

3.2. AMOS-Based CFA: Measurement Model

To test the measurement models of the PsyES, AMOS 23.0 was used to calculate a confirmatory factor analysis (CFA). Table 3 and Figure 1 show the CFA results, which in turn show that the overall goodness-of-fit chi-square was employed as a fit index for the model. The following metrics have the necessary threshold for the model fit: root mean square error of approximation (RMSEA), adjusted goodness of fit index (AGFI), comparative fit index (CFI), standardized root mean square residual (SRMR), chi-square/df (cmin/df), goodness of fit (GFI), and PCLOSE. The data's fit to the model was enhanced by the correlation between unobserved variance (e1–e12) that was constructed based on the modification indices' recommendations, leading to a potential tetra-dimensional PsyEM. Each item's factor loadings were evaluated as part of the CFA, and all items were retained due to appropriate factor loadings. The factor loading between the items (PsyES1 and PsyES12) and their respective constructs (meaning, competence, self-determination, and impact) were more than the recommended value (>0.5).

Table 3. AMOS-based CFA.

Measure	Suggested Range or Value	PsyEM Performance
Root mean square error of approximation (RMSEA)	<0.05–0.10	0.066
Comparative fit index (CFI)	>0.95	0.97
Chi-square/df (cmin/df)	<5.0	3.55
Good of fit (GFI)	>0.95	0.96
Adjusted goodness of fit index (AGFI)	>0.80	0.926
Standardized RMR	>0.09	0.035
PCLOSE	>0.05	0.09
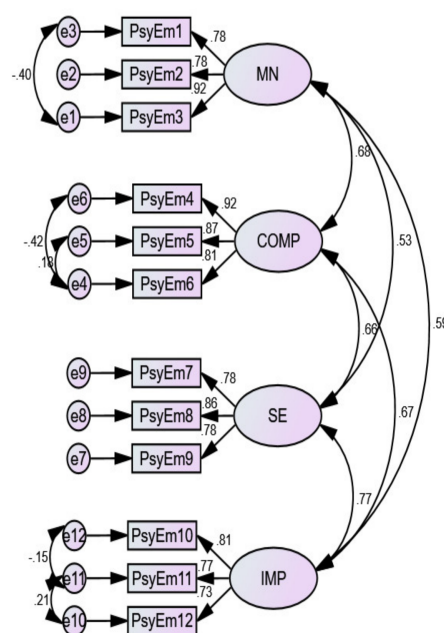
Figure 1. CFA of tetra-dimensional PsyEM using AMOS. e: Unobserved error; SE: self-determination; IMP: impacts; MN: meaning; COMP: competence. The scale is composed of 4 sub-dimensions.

3.3. Rasch Model

3.3.1. The Rating Scale Functioning

The rating scale's effectiveness was evaluated to ensure that it was used as intended for the PsyEM sub-dimensions. For several of the options on the PsyEMS Likert scale, the desired ten responses per subcategory were not achieved in this data set, especially for PsyEM1 (The work that I do is important to me). The fourth and fifth choices were combined on the Likert scale (Figure 2). This was decided to achieve more accurate assessments of how difficult the task was. There was a minimum of 15 and a maximum of 368 answers, respectively, and every available response was utilized for every question. Table 4 displays the frequencies of the rating scale for each sub-dimension.

Table 4. Function of the rating scale.

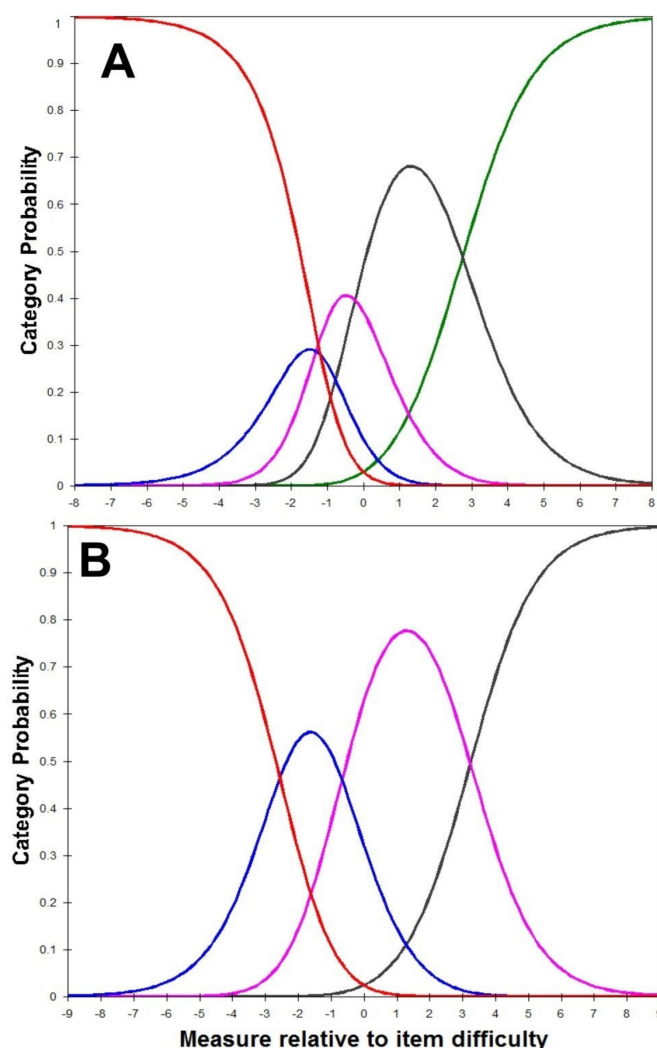| Sub-Dimensions	Minimum Frequency	Maximum Frequency
Meaning	15	318
Competence	19	368
Self-determination	17	364
Impact	21	280

Figure 2. The function of the rating scale, the first item in the scale (The work that I do is important to me) before (**A**), and after (**B**) combining the fourth choice and the fifth options on the Likert scale. This analysis is used to find out the appropriate number of paragraphs to perform any statistical analysis.

3.3.2. Model, Item, and Person Fits

The MnSq and Zstd values did not deviate from the two recognized limits or indicate that the data were consistent with the Rasch model based on the recommended indicators. We conducted a separate Rasch analysis for each subscale and the MnSq item varied from 0.98 to 1.01, while the Zstd values were between 0.10 and 0.20. Our objective was to test all items discovered in any four dimensions for as long as this scale was multidimensional. The values of MnSq and Zstd did not deviate from the boundaries to match the Rasch model, as shown in Table 5. All items had appropriate item fit statistics based on item fit values, and the loading was within the permitted range (Table 6). Furthermore, most participants provided a satisfactory level of goodness-of-fit to the Rasch model, although thirty-nine participants were removed based on their misfit data to enhance the scale's functionality.

Table 5. Rasch model fits and reliability indices.

Dimensions		IMnSq	Zstd	OMnSq	Zstd	Reliability	Separation Index
Meaning	Person	0.94	−0.30	0.95	−0.30	0.76	3.56
	Item	0.99	−0.20	0.99	0.0	0.95	4.40

Table 5. *Cont.*

Dimensions		IMnSq	Zstd	OMnSq	Zstd	Reliability	Separation Index
Competence	Person	0.74	−0.40	0.76	0.4	0.78	1.92
	Item	0.96	−0.5	0.77	−1.6	0.91	3.15
Self-determination	Person	0.88	−0.30	0.89	−0.30	0.70	1.54
	Item	0.98	−0.20	0.95	−0.5	0.96	4.67
Impact	Person	0.90	−0.4	0.90	−0.4	0.70	1.52
	Item	0.99	−0.1	0.93	−0.9	0.85	2.54
Whole Scale	Person	1.01	−0.1	0.98	−0.2	0.85	2.35
	Item	1.00	−0.1	0.99	−0.2	0.99	4.78

Table 6. Item fitting table.

Abbreviation	Measure	SE	IMnSq	Zstd	OMnSq	Zstd
PSYEM2	−0.13	0.10	1.27	1.80	1.36	1.53
PSYEM1	−1.07	1.20	1.20	1.75	1.11	1.02
PSYEM11	1.08	0.09	1.07	1.05	1.13	1.74
PSYEM9	0.9	0.09	1.07	0.93	1.10	1.35
PSYEM12	1.25	0.09	0.99	−0.17	1.03	0.44
PSYEM10	1.17	0.09	0.95	−0.77	1.00	−0.77
PSYEM3	−0.54	0.10	0.99	−0.06	0.93	−0.55
PSYEM7	0.2	0.10	0.98	−0.22	0.96	−1.55
PSYEM6	−0.77	0.10	0.95	−0.68	0.83	−0.55
PSYEM8	0.32	0.10	0.91	−1.29	0.91	−1.20
PSYEM4	−1.21	0.11	0.82	−1.68	0.70	−0.90
PSYEM5	−1.2	0.11	0.77	−1.75	0.75	−1.60

The participants included were sufficiently separated from one another, according to the person separation index for the meaning, competence, self-determination, and impact dimensions. The PsyEM items and their subscales could differentiate and separate the objects, as shown by the item separation indices that ranged from 1.25 to 4.78. Item reliability data ranging from 0.70 to 0.99 demonstrated that PsyEM and its subscales were regarded as reliable measurements.

3.3.3. Dimensionality

Based on eigenvalues and explained variances, PsyEM's multidimensionality was examined. As it was responsible for 10.8% of the total variation in the data and had an eigenvalue of 2.62, the first component, which was referred to as "first contrast", displayed a good amount of multidimensionality. The second and third contrasts, respectively, explained 8.3% and 7.0% of the total observed variance, and their eigenvalues were 2.02 and 1.74. The fact that the most important first contrast component explained 50.7% of the variance provided support for the scale's internal validity.

3.3.4. Wright Map

The participant hierarchy, also known as the item map (Figure 3), illustrates the relationship between the participants and the items along a continuum. The participants in this study tended to have more diverse characteristics than the items. This lends credence to the idea that the ability of the sample and the ability indicated in the items were related. Due to the fact that the mean of the item measurements was less than three standard deviations lower than the mean of the person measurements, the test–item targeting was carried out effectively.
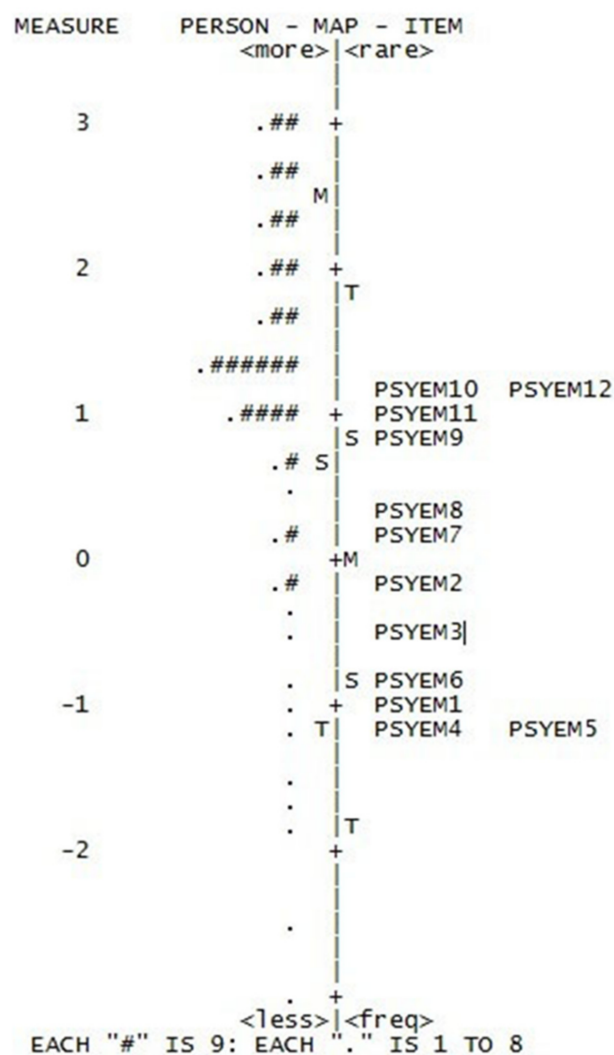
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Figure 3. The participant hierarchy (Wright Map).

4. Discussion

The idea of sustainable workplace well-being, as well as the degree to which it differs from other types of well-being in organizational contexts, has received scant attention in the research that has been conducted up to this point. As such, there is a need for additional study in this field because there is no scale that is universally acknowledged for measuring the sustainable well-being of workplaces. This research intended to validate the construct validity of the Arabic version of the PsyES by using Rasch analysis. To elaborate, the PsyES is a test that measures psychological distress. The results of this study showed that the scale, which consisted of 12 different items, contained many dimensions. Furthermore, the findings lend credibility to the utilization of a multidimensional scale. Thus, the conclusions made from past studies about the scale factors are given more weight [22–30]. According to the findings, each of the four subscales can potentially be defined by a scale that only has one dimension. In addition to this, it was discovered that the indicators for the subscales possessed an extremely high level of internal consistency. These findings add dimensionally supported evidence at the subscale level and are fairly compatible with research that concluded in the four-factor scale [23,27,31–35]. This study is the first to support this, and it is essential to note that these findings are consistent with previous research. Before researchers could construct a mean score to indicate a participant's level of psychological empowerment on that latent variable, they needed dimensionality support on the subscale level. This base is a crucial foundation that was required (the factor).

This research also provides some preliminary evidence for using the average score of the four items for each of the four subscales. It is important to note that the 12-item PsyES does not support the unidimensionality of the items at the item level. According to Hoffman, who claimed that the original version with its four subscales was one-dimensional and internally consistent, this investigation validated one-dimensionality for each of the four subscales. The research results are consistent with the idea that the PsyES is a multidimensional construct, as described in various studies, and they support the multidimensionality of the scale [36,37]. In conclusion, this may suggest that the findings are consistent with utilizing the mean score at the subscale levels and that the sum of the scores on each subscale corresponds to the variable underlying that subscale. Additionally, suppose a researcher wants to gather information on one of the scale's four characteristics without using any other subscales. In this case, these findings support using any of the scale's subscales as an independent unit. While these results are based on the data from the Arabic version, it is anticipated that we will obtain comparable results for the other samples, particularly given that the factorial analysis results' psychometric properties in the Arabic version were consistent with those in the original version [9,31].

According to the findings of this study's confirmatory validity analysis, the final model of structural PsyES was found to be appropriate and valid in all four subscales investigated. In the current study, we found that satisfactory results could be obtained via the model's fitness indices. A model is considered appropriate when its RMSEA is within acceptable limits, its GFI and AGFI are very close to 1, its SRMR is lower than 0.09, and its CFI is more than 0.9 [21]. Our analysis, which was based on the pattern fitness index, arrived at the conclusion that the aforementioned criteria were satisfied by our data. In accordance with the conclusions of this study, many other researchers have examined the CFA of the patterns that they have developed [38–40].

When analyzing the findings of this study, there is a restriction that must be taken into consideration. This limitation concerns the fact that the sample size was small. The sample was gathered from a single region of the country; hence, additional research employing samples gathered from other regions of the country would be required to verify the conclusions of this study.

5. Conclusions

In accordance with the findings achieved via AMOS, the final multidimensional scale model successfully approximates the data in this study. The Rasch model was used to further validate the multidimensionality of PsyES. The separation indices between people and items were more than 1.5, and the item characteristic curve supported the validity of the amended rating scale. The MnSq and Zstd values indicated that the data were compatible with the Rasch model based on the suggested indicators and did not stray from the two established limitations. This is the first study of its type to demonstrate the efficacy of the Arabic version of PsyES as a screening tool for psychological empowerment. Its four elements are a legitimate and trustworthy measuring technique that may be applied in several quantifiable sustainability-related domains. Data from various nations that utilize the PsyES may be used in future studies for comparisons. This will also enable the comparison of item ratings across nations. In conclusion, this study is the first to employ Rasch analysis to provide statistical justification for the usage of means at the level of PsyES scale subscales. On a separate note, psychological empowerment was measured with regard to another culture in this article. In addition, motivating and supporting employees to participate in CSR activities has been found to increase organizational engagement and job satisfaction, especially for sustainability-focused personnel. When senior management and HR bureaucrats examine their workplace's well-being strategy and practice it in conjunction with their sustainability agenda, there will be benefits for all parties involved. Important theoretical and methodological contributions have been made by this study to the existing body of research on the topic of sustainable workplace well-being. The conclusion of this research indicates a shift away from the concept of general workplace well-being

and towards the concept of sustainable workplace well-being as a new construct to be hypothesized within the scope of the triple bottom line approach relative to sustainable business strategies.

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Informed Consent Statement: Informed consent was obtained from all subjects involved in this study.

Data Availability Statement: Data are available upon reasonable request.

Conflicts of Interest: The authors declare no conflict of interest.

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