# Validation of the Indonesian WHOQOL-BREF Among Informal Workers: A Confirmatory Factor Analysis of Contextual Fit

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**Abstract.** Most of Indonesia's workers are informal laborers, and they face distinct socio-economic problems that may affect how they feel about their well-being. This study aims to evaluate the contextual fit of the WHOQOL-BREF among Indonesian informal laborers using Confirmatory Factor Analysis (CFA). There was a cross-sectional study with 31 female informal workers from metropolitan Indonesia. The 26-item WHOQOL-BREF questionnaire was filled out by the participants. We used Maximum Likelihood Estimation to check the model fit, factor loadings, internal consistency, and convergent validity. The unidimensional model did not fit well (CFI = 0.500; TLI = 0.457; RMSEA = 0.196; SRMR = 0.126). One item had a negative loading, and a few others did not have any effect. The internal consistency was high (Cronbach's α = 0.905), but the Average Variance Extracted (AVE = 0.349) showed that the convergent validity was not good enough.

**Keywords:** WHOQOL-BREF, Confirmatory Factor Analysis, Quality of Life, Informal Workers, Indonesia.

## 1 Introduction

Quality of Life (QoL) is a key concept in public health research. It is a multidimensional assessment of human well-being that includes physical health, mental health, social relationships, and environmental elements. It is especially important to measure it in low- and middle-income nations, where socio-economic differences and divided labor markets have a big impact on health outcomes. Indonesia is a good example of a place where these problems show up since it relies heavily on informal work. According to National Bureu of Statistic, informal employee referes to a status that is self-employed, casual agricultural worker, and casual non-agricultural worker. More than 51% of the workforce consists of informal laborers, who often operate in unstable situations without legal contracts and limited access to social safeguards [1].

These structural weaknesses not only hurt people's financial well-being, but they also change how people feel about their quality of life, which raises important questions about

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whether current tools, like the World Health Organization Quality of Life-Brief Version (WHOQOL-BREF ), can accurately reflect the complex realities of this group [2–4].

The World Health Organization created the WHOQOL-BREF, which is extensively used to measure health-related quality of life in people from different cultures. It has been shown to be valid in both clinical and community samples, and its psychometric strength has been proven in many situations. However, we cannot assume that it is valid in all situations. Respondents may perceive and answer the items differently, depending on their sociocultural background, economic situation, and job situation. This difference is especially important in Indonesia, where a large part of the workforce is made up of informal workers, which makes standardized tools less useful [3, 5, 6].

Although it is a significant source of employment absorption in Indonesia, the informal sector is marked by significant instability. Informal workers often have to deal with inconsistent income, no contracts to protect them, hazardous jobs , and restricted access to social security services. These vulnerabilities affect not just their material situations but also how they feel about their well-being, which is often different from what traditional QoL frameworks anticipate [2–4].

The history of informality shows how sensitive it is to changes in the economy: rates went down during the economic boom from 1986 to 1997, but they shot up dramatically after the Asian financial crisis in 1998 [3]. Right now, about two-thirds of the workforce is still working informally, with agriculture having the highest concentration [2]. Informal workers are now even more vulnerable due to structural factors like decentralized wage-setting policies, the growth of precarious platform-based work, and the destabilizing effects of the COVID-19 pandemic [4, 7]. These shifts necessitate measurement instruments that capture people's lived experiences in particular sociocultural contexts in addition to adhering to psychometric standards [8].

Although the WHOQOL-BREF is widely used in various settings, most validations to date have focused on specific patient groups, healthcare professionals, or general populations in high-income countries [4, 9, 10]. There has not been much interest in how informal workers may use it in low- and middle-income countries. This gap is significant since the presumptions made in the instrument's original architecture may not align with the unstable nature of informal work, which includes being vulnerable to workplace hazards, having erratic finances, and having little social support. Measurement error could arise from bias introduced by an instrument that has not been validated. Changes in the job market after the pandemic have made it even more important to improve quality of life (QoL) assessments for groups that have been hit hardest by these changes [8][11]. Confirmatory Factor Analysis (CFA) was employed to carefully verify whether the canonical four-factor structure of the WHOQOL-BREF is psychometrically sound when applied to Indonesia's informal workforce. This CFA aims to fill in the gaps in our knowledge. This instrument can accurately capture the group's subjective well-being and socioeconomic vulnerabilities, which makes it easier to identify possible variations in factor loadings and ensures measurement invariance.

By advancing the psychometric validation of the WHOQOL-BREF, this work makes both theoretical and practical contributions by moving the psychometric validation of the WHOQOL-BREF forward in this particular setting. It adds to cross-cultural studies on measuring quality of life by showing how global tools might be changed to work better for excluded groups [12, 13]. At the same time, the results will provide policymakers and public health professionals with specific evidence to inform the design of labor and health policies that are inclusive of everyone. This work helps to create tailored solutions that improve the resilience, health, and social protection of Indonesia's informal workers.

## 2 Methods

### 2.1 Study Design and Participants

This study used a cross-sectional quantitative psychometric validation design to test the concept validity and internal consistency of the WHOQOL-BREF instrument in Indonesia. The primary objective of the analysis was to employ Confirmatory Factor Analysis (CFA) to determine whether a one-dimensional model was suitable. Using Maximum Likelihood Estimation (MLE) methods, the study was done in JASP statistical software.

We used purposive sampling to select participants, focusing on women, as they are overrepresented in low-wage, precarious occupations such as domestic work, market vending, and small-scale services in urban areas. This study therefore focuses on female informal workers. They frequently experience more job insecurity, lower pay, less access to social protection, and increased exposure to workplace hazards than men. Women are therefore a particularly under-represented group in the informal economy, so it is crucial to look at their unique vulnerabilities and experiences. To be eligible, participants had to be adult women who worked informally, could give informed consent, and spoke Indonesian fluently. A total of 31 people completed the WHOQOL-BREF questionnaire, which comprises 26 questions that assess four theoretical areas of quality of life: physical health, mental health, social relationships, and the state of the environment. This study employed a single-factor model to determine whether a single latent construct could adequately explain the item responses. A significant limitation of this study is the comparatively small sample size, which reflects the financial and practical limitations of conducting fieldwork among female informal workers. Although even modest sample sizes are frequently used in preliminary instrument validation studies under similar constraints, it is important to take this exploratory nature into account when interpreting the results.

### 2.2 Measures

The World Health Organization developed the WHOQOL-BREF, a widely used tool for measuring perceived quality of life across various life domains. There are 26 elements in it, and they are split up into four areas: social interactions, physical health, psychological health, and the environment . For each item, a five-point Likert scale is used to show how strong, frequent, or satisfying it is.

The Indonesian version of the WHOQOL-BREF utilized in this study was based on the official translation provided by the WHO. Before it was used, the instrument went through a short cultural adaptation process that included occupational health expert evaluation and small changes to the language to make it clearer and more relevant for informal workers. There were no big changes to the structure. Trained field researchers conducted face-to-face interviews to collect data. This method made sure that everyone understood and reduced response bias.

### 2.3 Statistical Analysis

This study used Confirmatory Factor Analysis (CFA) to check if the WHOQOL-BREF had a single-dimensional structure in this group of people. The choice to employ CFA was based on its ability to check how well the observed data fit with the postulated latent components. The model specification included grouping all 26 items into one latent factor, which represented the overall quality of life.

We chose JASP software because it has a simple interface and clear reporting tools. These are especially helpful for applied researchers who lack statistical expertise [14]. We employed Maximum Likelihood Estimation (MLE) to figure out the model parameters.

The Comparative Fit Index (CFI), the Tucker-Lewis Index (TLI), the Root Mean Square Error of Approximation (RMSEA), and the Standardized Root Mean Square Residual (SRMR) were utilized to assess the model's fit. CFI and TLI must be greater than 0.90, RMSEA must be less than 0.08, and SRMR must be less than 0.08 for the thresholds to be acceptable. Items with factor loadings that were not significant or were negative were marked for further evaluation, and these diagnostics were used to make suggestions for how to change the model [15].

# 3 Results

## 3.1 Participant Characteristics

The study included 31 women who worked as informal laborers in cities. They came from different jobs, such as street sellers, domestic servants, and home-based service providers. Most of them were between the ages of 30 and 50 and had finished primary or secondary school. Most of the participants reported having low to moderate incomes, lacking formal job contracts, and not having health insurance. This demographic and occupational profile reveals the same socio-economic weaknesses common among Indonesia's informal workers.

The descriptive statistics for the WHOQOL-BREF responses revealed differences between domains. Some people reported moderate satisfaction with their bodily and mental health, but most had lower scores in social relationships and environmental factors, such as safety and access to healthcare services.

## 3.2 Confirmatory Factor Analysis

A Confirmatory Factor Analysis (CFA) was performed to analyze the measurement model further. The following CFA diagram shows the factor structure, including the observed variables, the latent construct, and their factor loadings. This picture helps readers better understand the results and complements the statistical numbers presented in the text.

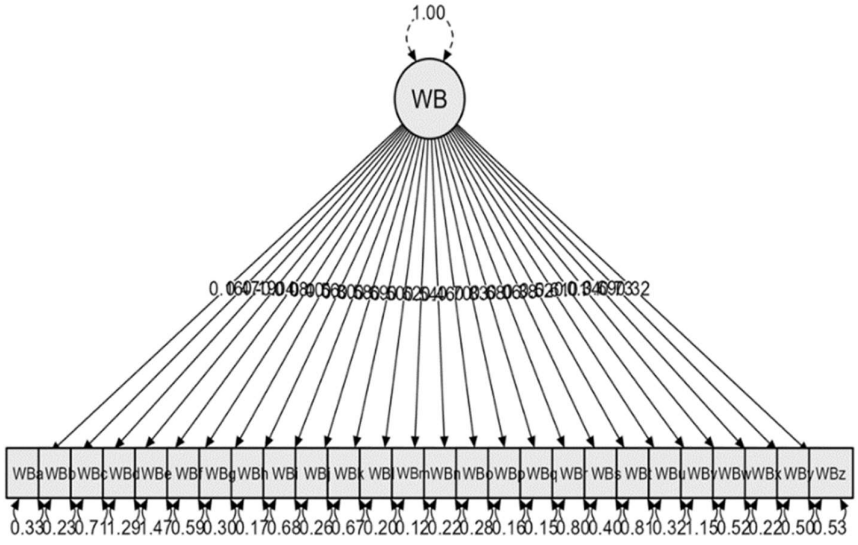


**Figure 1.** The Confirmatory Factor Analysis (CFA) of Well-Being

The Confirmatory Factor Analysis (CFA) done on the one-dimensional measurement model showed that the model fit was not very good overall shown from figure 1. The Tucker-Lewis Index (TLI) was 0.457, and the Comparative Fit Index (CFI) was 0.500. Both were well below the suggested threshold of 0.90. The acceptable cutoff of 0.08 is significantly lower than the Root Mean Square Error of Approximation (RMSEA), which was 0.196. This outcome indicates that the model and the observed data differed significantly. The Standardized Root Mean Square Residual (SRMR) was 0.126, which is above the normal limit of 0.08. Additionally, the chi-square test was significant ($p < .001$), further confirming that the model did not fit well.

With items WB1 through WB26 representing its observed indicators, the CFA model plot graphically illustrates how the latent factor "WB" (presumably referring to Well-Being) is measured. The diagram shows the observed variables as rectangles connected by arrows that represent factor loadings, and the latent variable WB as an oval. These loadings show how strongly each item and the latent factor are related. The construct of well-being is strongly reflected by items with high loading, such as WBp, which has a loading of 0.831.

Items with low or negative loading, like WBd with -0.041, on the other hand, add less to the measurement and might need to be changed or eliminated. A residual variance, symbolized by tiny circles, is also linked to each observed item and represents the variability that cannot be explained. A lower residual variance indicates that the variability of the item is adequately explained by the latent factor. The current model does not, however, fit the data well, according to the overall fit indices, which include an RMSEA of 0.196 and a CFI of 0.500. A CFI below 0.90 and an RMSEA above 0.08 typically indicate that the model needs to be improved or modified in order to better represent the underlying construct.

**Table 1.** Item Analysis and Reliability Statistics for Well-Being Scale

| | mean | If item dropped Std. deviation | Item-rest-correlation | Cronbach's a |
|---|---|---|---|---|
| **WB1** | 4.03 | .605 | .318 | .905 |
| **WB2** | 4.00 | .683 | .701 | .899 |
| **WB3** | 3.97 | .875 | .224 | .907 |
| **WB4** | 4.16 | 1.157 | .013 | .914 |
| **WB5** | 3.48 | 1.235 | .035 | .915 |
| **WB6** | 3.23 | .884 | .486 | .902 |
| **WB7** | 3.65 | .798 | .601 | .900 |
| **WB8** | 3.97 | .912 | .833 | .895 |
| **WB9** | 3.61 | 1.022 | .559 | .900 |
| **WB10** | 3.81 | .873 | .743 | .897 |
| **WB11** | 3.32 | .979 | .441 | .903 |
| **WB12** | 3.84 | .779 | .744 | .898 |
| **WB13** | 4.19 | .654 | .802 | .898 |
| **WB14** | 4.23 | .669 | .628 | .900 |
| **WB15** | 3.84 | .898 | .743 | .897 |
| **WB16** | 3.71 | .938 | .856 | .894 |
| **WB17** | 3.97 | .795 | .810 | .896 |
| **WB18** | 2.81 | .910 | .091 | .910 |
| **WB19** | 3.81 | .749 | .490 | .902 |
| **WB20** | 3.77 | 1.055 | .572 | .900 |
| **WB21** | 3.77 | .845 | .745 | .897 |
| **WB22** | 3.55 | 1.091 | -.101 | .916 |
| **WB23** | 4.55 | .810 | .456 | .903 |
| **WB24** | 4.13 | .846 | .795 | .896 |

| | | | | |
|---|---|---|---|---|
| **WB25** | 4.26 | 1.032 | .672 | .898 |
| **WB26** | 4.55 | .810 | .460 | .903 |

Table 1 shows fit indices are likely not very good due to the small sample size (n = 31). To provide stable and consistent parameter estimates, CFA typically requires sample sizes of 200 or more participants.

The analysis of item-level factor loadings revealed a pattern that differed across items. Items like WBp (loading = 0.831) and WBh (loading = 0.798) had strong links to the latent component and were statistically significant, which contributed to the model's accuracy. Nevertheless, several items, such as WBa, WBc, WBd, WBe, WBr, and WBv, displayed non-significant loadings, suggesting that the latent construct was not well or consistently represented. These discrepancies may result from participants misinterpreting the situation, disagreements over concepts, or elements that aren't pertinent.

One item, identified as item 22, displayed a negative loading (-0.101), raising concerns about its compatibility with the overall scale. This negative association could reflect issues in item phrasing, response format, or conceptual clarity, and it poses a risk of distorting the overall factor structure.

With a Cronbach's alpha of 0.905, the WHOQOL-BREF showed strong internal consistency in this sample in spite of these structural issues. Insufficient convergent validity was indicated by the Average Variance Extracted (AVE), which was 0.349 and below the suggested threshold of 0.50. Although the scale items are consistently interpreted, this AVE indicates that they might not all together represent a logical underlying construct. Therefore, to improve construct alignment, item refinement, exploratory factor analysis (EFA), or a revised factor model should be investigated.

### 3.3 JASP Software Performance

In this small-sample study, ASP software worked well and was easy to use for CFA. Its graphical user interface, drag-and-drop functionality, and clear statistical output layout all helped to lower analytical error. For researchers with limited statistical expertise, JASP offers user-friendly workflows and clear results presentation. The software also provides useful visual outputs, such as path diagrams and loading significance indicators, that facilitate interpretation [16].

But when it comes to advanced model specification and parameter customization, JASP isn't as flexible as platforms like R or M-plus. Nevertheless, JASP remains a dependable and effective tool for conducting preliminary CFA in actual research settings.

## 4 Discussions

### 4.1 Interpretation of CFA Results

The CFA results showed that this sample of Indonesian informal workers did not respond well to the traditional four-factor structure of the WHOQOL-BREF. Key fit indices, i.e. the Comparative Fit Index (CFI = 0.500) and Tucker-Lewis Index (TLI = 0.457) were significantly below the standard threshold of 0.90, indicating poor model fit. The Root Mean Square Error of Approximation (RMSEA = 0.196) and Standardized Root Mean Square Residual (SRMR = 0.126) also exceeded acceptable limits. At the same time, a significant chi-square statistic ($p < .001$) confirmed notable divergence between the hypothesized model and observed data [7, 17].

These findings suggest that, despite its broad population validation, the original WHOQOL-BREF framework may not adequately represent how Indonesian informal workers conceptualize quality of life. The unique socioeconomic difficulties this group faces are

probably the cause of this misalignment. Informal workers often lack job security, social protection, and consistent income. They are regularly subjected to hazardous working conditions , such as musculoskeletal and physical exertion triggers to fatigue [2, 4]. These elements can have a major impact on how they perceive social and environmental stability, as well as psychological and physical well-being [8].

Cultural influences may also play a critical role. In collectivist societies like Indonesia, social support and communal relationships may be interpreted differently than in the more individualistic contexts where the WHOQOL-BREF was originally developed [2, 4]. These cultural differences may cause certain items to be conceptually misaligned or misinterpreted, potentially explaining the presence of non-significant factor loadings and the negative loading observed for item [5, 13, 18].

Although model fit was suboptimal, internal consistency remained high (Cronbach's $\alpha$ = 0.905), indicating consistent responses across items from participants. Nonetheless, high reliability does not equate to construct validity. These findings underscore the importance of culturally and contextually adapting QoL instruments for use in diverse and vulnerable populations. Future research should explore exploratory factor analysis (EFA) and culturally informed revisions to improve the alignment between theoretical constructs and the lived experiences of informal workers [12, 19, 20].

**4.2 Comparison with Previous Studies**

Validation efforts of the WHOQOL-BREF have consistently affirmed its four-domain structure in diverse global settings. Skevington et al. demonstrated strong psychometric properties across multiple cultures [10], and Kalfoss et al. validated the instrument among the Norwegian general population [21]. Among formal-sector workers in urban areas, studies have shown acceptable CFA indices, often attributed to socio-economic stability and health literacy [19][22].

However, issues like job insecurity, limited access to healthcare, and irregular income may make it difficult to distinguish between the WHOQOL-BREF domains in informal employment contexts like Indonesia [3, 8]. Domain interpretations may also be influenced by collectivist cultural norms [23]. Studies like Kaplan-Kahn et al. [13] support findings from Berlim et al. on varying internal consistency by context [9] and from Naegeli et al. on convergent validity across disease states [12].

While comparative studies using SF-36 confirm the general reliability of WHOQOL-BREF [24], they often do not address the nuanced realities of informal workers. This fact emphasizes the need for unique validation techniques to guarantee measurement applicability and policy impact.

**4.3 Methodological Considerations**

The small sample size (n = 31) results in significant methodological limitations. Larger samples are usually required for Confirmatory Factor Analysis (CFA) to yield accurate estimates and stable model fit indices. Because standard fit thresholds may not hold and parameter estimates are unstable, type I or II errors are more likely to occur in small samples.

Despite these drawbacks, this study offered preliminary insights into the WHOQOL-BREF's suitability for use in a population that is underrepresented. Rather than drawing definitive conclusions, the objective was to identify potential misalignments and guide future model improvements. Both the design of larger-scale validation studies and the development of more appropriate tools for use in informal.

### 4.4 Public Health Implications

There are significant ramifications when using standardized QoL instruments with groups such as Indonesia's informal labor force. This group frequently faces socioeconomic disadvantages that affect their perceptions and overall happiness. Tools such as the WHOQOL-BREF need to be culturally adjusted to close these gaps.

In order to ensure that instruments accurately represent lived realities, community-based validation techniques are crucial. Assessments may be more accurate if context-specific stressors like food insecurity or informality at work are included. Results from modified QoL instruments can guide interventions that improve mental health, social protection, and access to healthcare. Longitudinal use of such tools can track intervention impact and support responsive policymaking.

In summary, adapting WHOQOL-BREF to reflect Indonesia's informal workforce ensures reliable data and informs effective, equity-driven public health strategies.

## 5 Conclusion

Confirmatory Factor Analysis (CFA) was used in this study to evaluate the construct validity of the WHOQOL-BREF among informal workers in Indonesia. Despite strong internal consistency, poor model fit indices and weak convergent validity suggest that the instrument's standard structure does not accurately represent the quality-of-life experiences of this group. The instrument, which was first validated for other populations, may not adequately consider the unique challenges faced by informal workers, such as cultural factors like family and collectivist values, economic precarity, and limited access to healthcare, according to this model.

The results demonstrate how urgently the WHOQOL-BREF for informal workers needs to be modified, either by changing items, rearranging domains, or creating a hybrid model that takes into account their socioeconomic and cultural background. Future research should use larger, more varied samples and mixed methods to capture these experiences better.

Indonesia's sizable informal workforce, accurate assessments, successful social policies, and focused public health interventions depend on a contextually relevant quality-of-life tool to improve the well-being and health equity of informal workers.

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The authors affirm that the grammar in this manuscript was improved using Grammarly software.

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