Adaptation and Psychometric Properties of Benevolent Childhood Experiences Instrument among Undergraduate Students

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Abstract. Previous research adapted the BCEs-20 for Indonesian at-risk adults due to their vulnerability to mental health issues. However, it lacked thorough validity testing. Given these limitations, there is a critical need for further psychometric properties evaluation. This study aims to conduct a adaptation and psychometric evaluation of the Benevolent Childhood Experiences (BCEs) scale among undergraduate students in Indonesia. Method: We recruited 239 undergraduate students aged 18-25 years using convenience sampling. The data were analyzed using Confirmatory Factor Analysis to test the construct validity and Alpha Cronbach to assess the reliability. The results showed that the Indonesian version of BCEs-20 had a good content validity. However, CFA showed that it met only 2 criteria from the fit indices RMSEA and SRMR, both of which were below the cut-off value of 0.8. Beside that, Alpha Cronbach demonstrated coefficients > 0.7. Conclusion: The Indonesian version of the BCEs-20 exhibited adequate reliability but did not meet the standards for construct validity.

Keywords: Benevolent childhood experiences, psychometric properties, undergraduate students

1 Introduction

College students are a period of transition from adolescence to early adulthood. This transition requires students to feel increasing responsibility, making them vulnerable to depression [1]. The results of research by Martasari and Ediati found that around 40% of students suffer from mild to severe depressive disorders [2]. Previous research also shows that people aged 18-25 years are the most likely to commit suicide because depression [3]. Depression is a major mental health issue for college students that must be addressed immediately because people with certain levels of depression tend to reduce their productivity [1]. Previous research examined the relationship between depression and ACEs (Adverse Childhood Experiences), including Mawaguzi's research on university students in Africa, found that both had a positive relationship [4]. This proves that when ACEs are high, students experienced more depression symptoms.

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Research on individual childhood experiences has long been a primary focus in developmental studies, particularly in understanding how early experiences shape long-term mental and physical health. Rahapsari et al. noted that large-scale studies on Adverse Childhood Experiences (ACEs) began through collaboration between the Department of Preventive Medicine and the US Centers for Disease Control and Prevention, yielding surprising results [5]. These studies revealed that negative experiences during childhood have significant impacts on mental health, disease risks, sexual behavior, disability, and substantial healthcare costs over a decade. One key outcome of this research was the development of the Adverse Childhood Experience Questionnaire by Felitti et al. [6], which has since provided extensive epidemiological evidence of the strong relationship between adverse childhood experiences and both physical and mental illnesses in adulthood [7]. Over the past 25 years, this instrument has been adapted into various languages and applied across different age groups.

However, the understanding of human development is not limited to the negative impacts of adverse experiences. With growing attention to the concept of Positive Childhood Experiences (PCEs), factors such as a stable family environment, quality education, positive peer relationships, and safe living conditions have been shown to play a crucial role in shaping an individual's psychological well-being [8]. For instance, responsive and stable interactions with adults in a child's environment are essential for healthy emotional and cognitive development [9], and these factors can protect a child from the negative impacts of adverse experiences. Narayan et al. further developed the Benevolent Childhood Experiences Scale (BCEs), which is expected to contribute to individual resilience by highlighting how positive social experiences in early life can promote adaptation and well-being [10].

Studies on ACEs show that children who face adverse experiences often exhibit delayed cognitive and social development, mental health issues such as depression, and engage in high-risk behaviors [11]. In this context, the understanding of the importance of positive experiences, particularly during early childhood, becomes increasingly relevant. The brain undergoes rapid development from the prenatal period to around the age of five, making this phase highly sensitive to both positive and negative influences [12]. While negative experiences can lead to various physical and mental health problems later in life, positive experiences—such as opportunities for creative expression and play, healthy nutrition, and supportive relationships in the family and school environment—are proven to protect children from the risks of depression and anxiety [13]. Indeed, studies during the pandemic have shown that positive childhood experiences are associated with lower levels of depression and loneliness [14].

Thus, both adverse and positive childhood experiences have a profound impact on an individual's development into adulthood. While ACEs help explain the detrimental effects of negative experiences, BCEs offer a more optimistic perspective by emphasizing the importance of positive experiences in fostering resilience and long-term well-being [15]. Benevolent Childhood Experiences refer to positive childhood experiences such as growing up with at least one safe caregiver, having one or more close friends, and having predictable home routines [14]. Positive childhood experiences predict better health quality in adulthood [16]. Landa-Blanco et al. added that positive childhood experiences are also positively related to flourishing and Light Triad traits, including Kantianism (respecting the dignity of all individuals), humanism (valuing the well-being of others), and faith in humanity (believing in the inherent goodness of people) [17]. Doom et al. argued that interventions aimed at promoting BCEs could be an effective way to support resilience and well-being during and after the pandemic [14]. In Merrick et al.'s study

on homeless adults in the United States, it was found that individuals with BCEs had lower levels of psychological distress and parenting stress and higher levels of social support [15].

Narayan et al. stated that BCEs is an instrument that assesses positive experiences from birth to age 18, characterized by perceptions of safety, security, internal and external support, and a positive and predictable quality of life [10]. The initial BCEs instrument had 10 items developed to serve as a 'counter' to the ACEs, which also has 10 items [18]. Narayan et al. then developed a new version of BCEs, considering that the initial BCEs scale did not comprehensively assess positive childhood experiences, as it lacked questions regarding identity, broader community, or other socio-ecological factors, and some initial BCEs items did not have adequate variability [18]. A new version of BCEs was developed, adding 10 items covering physical and health factors (e.g., access to nutritious food, medical care, and good sleep quality), community safety factors (e.g., adequate law enforcement), and environmental factors (e.g., regular exposure to nature).

Narayan et al. noted that the BCEs instrument was specifically developed to address some shortcomings of existing instruments measuring positive childhood experiences [10]. This instrument was also designed for cross-cultural use, including for individuals growing up in rural or developing countries. Additionally, BCEs was developed for non-English speakers, ensuring the items are culturally sensitive [10]. The advantages of BCEs-20 compared to the initial version include more specific items for health, community safety, and environmental factors [18]. The BCEs-20 scores showed a much stronger relationship with depression, anxiety, and PTSD symptoms compared to the original BCEs scores. Furthermore, the items and total scores on the BCEs-20 instrument had greater variability than the original BCEs. Additionally, the BCEs-20 instrument utilized individual-oriented cluster analysis, highlighting the importance of using individual-oriented methods to understand the interaction between levels of positive childhood experiences and levels of childhood adversity on individual mental health [18].

In Indonesia, the measurement of positive experiences is still not well-developed. Previous studies have adapted BCEs for Indonesia in the context of at-risk young adults (our adaptation study) but the evaluation of its psychometric properties remains very limited. Several countries have analyzed the psychometric properties of BCEs, such as in the Portuguese population [19] and the adult population in China [20]. However, no studies have been found that analyze the psychometric properties of BCEs-20 in at-risk adults in Indonesia. BCEs can be used in at-risk populations, such as studies with samples of pregnant women with childhood adversities [10], incarcerated individuals [15], individuals with risky behaviors [21], as well as normal populations such as students [22] and adults [17,19]. It is evident that research on BCEs-20 in Indonesia is still very limited, especially for evaluating its psychometric properties.

Confirmatory Factor Analysis (CFA) was utilized for validating the BCEs-20 instrument. CFA is a statistical technique employed to evaluate a pre-established factor model and ascertain the correlations between observed variables and latent constructs [23]. CFA provides several advantages, notably enhancing the precision and validity of subsequent analyses by ensuring that measurements and data accurately reflect the intended theoretical constructs. Previous studies employing CFA have consistently yielded findings that confirm the construct validity of BCEs. [19,24-25].

Despite the adaptation and psychometric testing of the BCEs scale in various countries, it has not yet developed as a tool for assessing positive childhood experiences in the Indonesian context. This is especially true for young adults, particularly university students. Therefore, this study aims to conduct a cross-cultural adaptation and psychometric evaluation of the Benevolent Childhood Experiences (BCEs) scale among undergraduate students in Indonesia.

2 Methods

2.1 Study Design

This study represents a quantitative research project conducted at the Faculty of Psychology, Diponegoro University. Data collection was carried out from June to July 2024 via an online form. Ethical clearance has been obtained under the reference number 549/UN7.F11/PP/VI/2024.

2.2 Participants

The study engaged undergraduate students from the 2022 cohort of the Faculty of Psychology aged 18-25 years old. According to the sample size requirements for factor analysis, a minimum of 175 subjects is necessary [26]. Therefore, the study included a total of 239 students. Additionally, demographic data such as gender, ethnicity, presence or absence of a trauma history, and birth order were assessed.

2.3 Instrument

The instrument adapted in this study is the Benevolent Childhood Experiences-20 (BCEs-20) Scale, developed by Narayan et al. [18]. The BCEs-20 comprises 20 questions with two response options. A "Yes" response, which signifies a positive outcome on this instrument, is assigned a score of 1, whereas a "No" response is assigned a score of 0. Consequently, the BCEs-20 scores range from 0 to 20. Narayan et al. indicated that this scale can be useful for clinical practice and community mental health [18]. The BCEs-20 also shows significant correlations with depression, anxiety, and PTSD symptoms (related to ACEs) and provides greater variability for measuring subjects with different profiles. According to the researchers' review, there have been no studies analyzing the reliability of the BCEs-20. However, the original version of the BCEs demonstrated an interrater reliability of 0.7.

2.4 Procedure

Adaptation in this study followed the cross-cultural adaptation procedure for an instrument as proposed by Beaton et al. [27]. The stages include forward translation, synthesis, backward translation, expert review, and pre-testing scale.

Forward Translation. As required by Beaton et al. [27], the researchers used two translators to translate from the source language (English) to the target language (Indonesian). Translator 1 (T1) is a sworn translator from the Pro Translation agency who was not informed about or knowledgeable of the constructs in this instrument. Translator 2 (T2), on the other hand, is an individual with a PhD in psychology who is an expert in developmental psychology. In other words, T2 has knowledge of the relevant constructs. This process took three to seven days.

Synthesis. The results obtained from T1 and T2 were then synthesized by an individual who also has a PhD in psychology. At this stage, synthesis was carried out by reaching a consensus and finding a midpoint between the results of T1 and T2.

Backward Translation. The synthesized results were then translated back into the source language of the adapted instrument, from Indonesian to English. Backward Translator 1 (BT1) is a translator from the Excellent Translation agency a native speaker with English as their mother tongue. The Backward Translator 2 (BT2) from Linguosco Consultancy Institution. The translator is Indonesian but was born and raised in Sydney, Australia, and proficient as a native speaker.

Review from Expert. This adaptation involved two experts to review the results from the first three stages of adaptation. Following the criteria suggested by Beaton et al. [27], we engaged health professionals and methodologists to review the entire adaptation process. Experts then provided comments regarding semantic, idiomatic, experiential, and conceptual equivalence.

Pre-testing Scale. We used 80 undergraduate students with ACEs (at-risk individuals) from the Faculty of Psychology at Diponegoro University to conduct the scale trial. A total of 80 students were selected following a previous data collection process, which involved screening students who had experienced trauma.

The next step involves evaluating the psychometric properties of the BCEs-20 scale with a larger sample size of 239 undergraduate students. The final scale were analyzed using Confirmatory Factor Analysis (CFA) to examine the factorial structure of the proposed model. Initially, the researchers assessed the model fit using goodness-of-fit indices such as Root Mean Square Error of Approximation (RMSEA), Standardized Root Mean Square Residual (SRMR), Comparative Fit Index (CFI), and Tucker-Lewis Index (TLI). The established cut-off values were RMSEA < 0.08, SRMR < 0.08, CFI > 0.9, and TLI > 0.9. For the chi-square ($\chi 2$) statistical test, the researchers reported the value but did not use it as a basis for determining model fit due to its sensitivity to sample size [31]. After evaluating the model fit, the researchers analyzed the parameters. According to Umar and Nisa, an item should be eliminated under three conditions: when the factor loading is negative, not significant, or has residual correlations with many items [28]. In this study, items were reduced if their factor loadings were found to be insignificant. The CFA was then re-analyzed following the same procedure. The researchers concluded the analysis by conducting a reliability test using Alpha Cronbach.

2.4 Data Analysis

The data analysis for this study utilized Jamovi version 2.3.28 to conduct Confirmatory Factor Analysis dan reliability test.

3 Results

3.1 Participant's characteristics

Participants in this study were 239 undergraduate students aged 18 to 22 years (M = 19.85, SD = 0.68). Overall, the majority of participants were female students. **Table 1** provides a detailed representation of the participants' demographics.

3.2 Adaptation

The expert reviews indicated that the Indonesian version of the BCEs-20 was clear and comprehensible in general. There were only minor semantic disagreements among the experts regarding the wording of items 7, 8, and 16. Specifically, these minor disagreements are presented in **Table 2.**

Table 1. *Demographic characteristics of participants*

Variables	n	%
Gender		
Male	40	16.74
Female	199	83.26
Ethnic		
Java	161	67.36
Batak	23	9.62
Sunda	13	5.44
Others	42	17.57
Conditions		
With ACEs	158	66.11%
Without ACEs	81	33.89%
Birth Order		
Firstborn	99	41,42
Middle	37	15,48
Lastborn	103	43,09

Overall, idiomatic, experiential, conceptual, and semantic equivalence was achieved through the adaptation process between the source and target questionnaires, thereby fulfilling the criteria for cross-cultural adaptation of the instrument. Following consensus and approval from all experts, the researchers finalized the BCEs-20 instrument for testing with 80 undergaduate students.

The reliability of the data, analyzed using Cronbach's Alpha, resulted in a value of 0.776, indicating that it is reliable. According to Azwar, a reliability coefficient approaching 1,00 suggests that the data is reliable for use as a research measurement [29].

3.3 Data Analysis

The final Indonesian version of the BCEs-20 scale, after undergoing a comprehensive process of cross-cultural adaptation, was subsequently subjected to further psychometric property testing. In this study, Confirmatory Factor Analysis (CFA) was conducted twice. In the first stage, all 20 items of the BCEs-20 were included. The CFA results from this stage indicated that only two fit indices were met: RMSEA and SRMR. Specifically, the values were RMSEA = 0.073, SRMR = 0.067, CFI = 0.671, and TLI = 0.609. The factor loading coefficients for the BCEs-20 can be found in **Table 3**.

Several items, such as items 1, 8, 14, 15, and 19, had non-significant factor loading coefficients. According to Umar and Nisa, these items should be reduced [31]. Consequently, the researchers decided to eliminate these items and conducted a second stage of CFA excluding items 1, 8, 14, 15, and 19. Table 2 presents the comparison of model fit indices between Model 1 (20 items) and Model 2 (15 items). Although the CFI and TLI indices did not meet the model fit criteria, Model 2 showed higher CFI and TLI values.

***Table 2**. Expert committee review*

Item #	BCEs-20	Adaptation	Feedback	Revised
7	Was there an adult (not a parent/caregiver or the person from #1) who could provide you with support or advice?	Adakah orang dewasa (di luar orang tua/ pengasuh) yang dapat memberikan dukungan atau nasihat?	Not semantically equivalent, but still relevant because it does not have to refer to number 1.	Adakah orang dewasa (di luar orang tua/ pengasuh atau orang nomor 1) yang dapat memberikan dukungan atau nasihat?
8	Did you have opportunities to have a good time?	Apakah Anda memiliki kesempatan menikmati waktu luang?	Not semantically equivalent, "good time" is more synonymous with "bersenang-senang" (*having fun*) rather than "waktu luang" (*free time*)," which could be translated as "free time."	Apakah kamu memiliki kesempatan untuk bersenang-senang?
16	Did you feel that you were treated fairly (e.g., in your family and community)?	Apakah Anda merasa bahwa Anda diperlakukan adil? (misalnya di keluarga dan komunitas Anda)	Semantically equivalent but the sentence is more effective in T1's translation ("Apakah kamu merasa diperlakukan dengan adil (misalnya di keluarga dan komunitasmu)?")	Apakah Anda merasa diperlakukan dengan adil (misalnya di keluarga dan komunitas Anda)?

***Table 3**. Factor loading coefficient of BCEs-20 (20 items)*

Notes: *significant at $p<0.01$

Variables	Std. Estimates	S.E.	*p*
Item-1	0.0551	0.02898	0.454
Item-2	0.3185	0.01122	< .001
Item-3	0.4124	0.01190	< .001
Item-4	0.2736	0.02157	< .001
Item-5	0.3009	0.02837	< .001
Item-6	0.3660	0.01920	< .001
Item-7	0.4344	0.02531	< .001
Item-8	0.2404	0.00939	0.001
Item-9	0.5525	0.02416	< .001
Item-10	0.5259	0.03146	< .001
Item-11	0.6639	0.02752	< .001
Item-12	0.2794	0.02015	< .001
Item-13	0.5439	0.02725	< .001
Item-14	0.1252	0.00834	0.095
Item-15	0.1138	0.01057	0.123
Item-16	0.4932	0.02461	< .001
Item-17	0.3479	0.01785	< .001
Item-18	0.2971	0.01634	< .001
Item-19	0.2335	0.03660	0.001
Item-20	0.4132	0.02765	< .001

***Table 4**. Comparison of fit indices across model*

Note: $\chi 2$: Chi-square; df: Degree of Freedom; RMSEA: Root Mean Square Error of Approximation; SRMR: Standardized Root Mean Square Residual; CFI: Comparative Fit Index; TLI: Tucker-Lewis Index

Fit Indices	Model 1	Model 2
$\chi 2$/df (*p)*	365/160 (p<0.001)	218/90 (p< 0.001)
RMSEA	0.073	0.077
SRMR	0.067	0.065
CFI	0.671	0.751
TLI	0.609	0.709

The factor loading coefficients for Model 2 are shown in **Table 5**, indicating significance across all items with factor loading coefficients ranging from 0.259 to 0.669. The specific details are provided in the table below.

Table 5*. Factor loading coefficient of BCEs-20 (15 items)*

Variables	Std. Estimates	S.E.	*p*
Item-2	0.314	0.0112	< .001
Item-3	0.416	0.0118	< .001
Item-4	0.259	0.0213	< .001
Item-5	0.314	0.0281	< .001
Item-6	0.373	0.0191	< .001
Item-7	0.438	0.0250	< .001
Item-9	0.548	0.0236	< .001
Item-10	0.518	0.0306	< .001
Item-11	0.669	0.0270	< .001
Item-12	0.304	0.0193	< .001
Item-13	0.545	0.0271	< .001
Item-16	0.498	0.0241	< .001
Item-17	0.347	0.0177	< .001
Item-18	0.294	0.0162	< .001
Item-20	0.421	0.0274	< .001

At the end of the analysis, the researchers conducted again the Alpha Cronbach reliability test. The 15-item BCEs-20 Model 2 demonstrated a slightly higher Alpha Cronbach reliability coefficient compared to Model 1. The results showed that BCEs-20 Model 1 had a Alpha Cronbach reliability coefficient of 0.740, while Model 2 had a coefficient of 0.761. According to Azwar [29], a reliability coefficient of 0.7 is considered adequate.

4 Discussion

This research aims to conduct a cross-cultural adaptation and psychometric evaluation of the Benevolent Childhood Experiences (BCEs) scale among undergraduate students in Indonesia. Beaton et al. stated that the process of adaptation before entering the pre-testing stage, several steps need to be conducted are forward translation, synthesis, and expert review [27]. In this process, the BCEs measurement tool underwent revisions on three items, specifically items number 7, 8, and 16. The revisions made to these items were adjustments of terms to ensure that the cross-cultural adaptation was accurate. According to Beaton et al. in the process of adapting measurement tools, decisions by the review committee are required to achieve equivalence between the source and target versions in four aspects: semantic equivalence, idiomatic equivalence, experiential equivalence, and conceptual equivalence [30]. The results of the adaptation's analyisis indicate that the adaptation of the BCEs-20 scale into Indonesian shows consistent validity with the original BCEs scale by Narayan et al. [18].

Then the analysis of psychometric evaluation showed that the model only fits based on two fit indices, namely RMSEA and SRMR. Previous studies that also used CFA analysis include the study by Gunay-Oge et al., which showed that the model fit on four indices, namely GFI=0.95, CFI=0.86, NFI=0.70, and RMSEA=0.05, indicating that the factor structure of the adaptation is at a good level [30]. Another study that also used CFA analysis by Almeida et al. showed that the scores were GFI=0.99, CFI=0.94, NFI=0.92, and RMSEA=0.043, which also indicated that the model is well-accepted [19].

Additionally, Brown mentioned that goodness-of-fit indices are divided into three categories: absolute fit, parsimony correction, and incremental fit [31]. Absolute fit includes the fit indices $\chi 2$ and SRMR, parsimony correction includes RMSEA, and incremental fit includes the fit indices TLI and CFI. Brown argues that researchers should take at least one fit index from each category because they provide different information [31]. In other words, the factor analysis results of this study do not meet the criteria for goodness-of-fit indices.

Another possible reason for the poor model fit is the inadequacy of the estimation method used, specifically Maximum Likelihood Estimation (MLE). According to Christoffersson, Flora, and Curran, factor analysis methods based on categorical data have been developed [32-33]. However, current factor analysis studies are still predominantly using the Maximum Likelihood (ML) estimation method, which is based on continuous data, for categorical data. This may result in biased standard errors and chi-square ($\chi 2$) statistics in model estimation [34]. However, the reliability coefficient in BCEs-20 Model 1 is 0.740 while Model 2 shows a coefficient of 0.761. This shows that the reliability coefficient in the two models is sufficient.

Certain items were dropped due to various reasons. Firstly, items such as item 1 ("Did you have at least one caregiver with whom you felt safe?"), item 14 ("Did you have access to food that was healthy and nutritious?"), and item 15 ("Do you have access to adequate healthcare services when you need them. Did you have access to adequate medical care when you needed it??") may reflect cultural differences between Indonesia and Western countries regarding caregiving practices, socio-economic conditions influencing well-being and health. Indonesia, categorized as a collectivist culture, emphasizes parental caregiving, while Western countries, characterized by individualistic cultures, often rely on childcare facilities [35]. Additionally, socio-economic

conditions in Indonesia, a developing country, significantly impact community happiness levels [36].

Secondly, Indonesian respondents may interpret these items very positively, resulting in nearly universal "yes" responses, which contrasts with responses typically found in Western contexts. For instance, item 8 ("Did you have opportunities to have a good time?") correlates positively with individual experiences, influenced by Indonesia's predominantly religious population, contributing to a high level of spirituality. This differs from atheistic tendencies observed in parts of Western societies [39]. Similarly, item 19 ("Did you regularly spend time outside in the sunshine or around nature?") may be a common practice for Indonesians in tropical regions, unlike individuals in Western countries with different climate patterns, leading to uniformly positive responses.

5 Conclusion

Benevolent childhood experiences play an important role as this variable is one of the developmental assets for positive adolescent and adult development, serving as a promotive and protective factor in building resilience. Previous studies have indicated that BCEs represent positive childhood experiences more effectively than other instruments. Several countries have adapted the questionnaire to align with the conditions of the regions where data collection will occur. The BCEs-20 questionnaire, which has undergone content validation and adaptation into Indonesian using the five stages of instrument adaptation according to Beaton, has shown adequate reliability [27] However, validation test of the BCEs-20 instrument on students in this study yielded results that differed somewhat from the psychometric property evaluations of BCEs adapted in other countries. The Confirmatory Factor Analysis of the Indonesian version of BCEs-20 using a single-factor (unidimensional) model, in accordance with the theory, was not sufficient as an accurate measurement tool. Meanwhile, the reliability test showed adequate coefficient results, indicating it can be trusted as a measurement tool. However, the BCEs-20 should be re-evaluated, as a good measurement tool must be both reliable and valid. Future research is recommended to increase the number of participants from various ages and backgrounds and to re-evaluate using more appropriate estimation methods for categorical data and model of BCEs.

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