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Transcultural Adaption and Validation of Korean Version Freibrug Mindfulness Inventory (FMI): Assessing Mindfulness in Forest Therapy Sessions

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Abstract: Forest therapy is associated with several health advantages, such as stress reduction and improved psychological health. Mindfulness, an important component of forest therapy, is also associated with improved health outcomes. However, few studies have empirically evaluated mindfulness in forest therapy settings. This study translated the Freiburg Mindfulness Inventory (FMI) in the context of forest therapy into Korean and then validated it. (1) Methods: This study included 352 individuals. Four other psychometric tools were administered to ensure criterion validity. Exploratory and confirmatory factor analyses were implemented to determine the factor structure. Furthermore, item validity was assessed using item response theory. (2) Findings: A two-factor structure of the FMI, comprising acceptance and presence, was the most suitable. However, excluding item 13 enhanced the model fit (χ^2 [df] = 169.9 [64], comparative fit index = 0.93, Tucker-Lewis index = 0.92, root mean square error of approximation = 0.069). The FMI had satisfactory psychometric properties. (3) Conclusion: The FMI was translated into Korean and validated, serving as a valuable instrument for assessing mindfulness in the context of forest therapy. We identified that item 13 should be excluded. Our results demonstrate the potential effects of mindfulness on mental health in forest therapy.

Keywords: Freiburg Mindfulness Inventory (FMI); item response theory; rating scale model; validation; forest therapy effect; mental health; mindfulness; mindfulness scale; psychometrics

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1. Introduction

Forest therapy involves immersing oneself in a forest environment with the aim of obtaining health benefits [1]. An increasing number of studies have suggested that nature-based therapies, including forest therapy, have significant beneficial effects on health [2,3]. The therapeutic effects of nature can be attributed to various factors, including the presence of phytoncides and the calming influence of natural visual and auditory stimuli [4]. Numerous studies have demonstrated that individuals participating in forest therapy experience a decrease in stress hormones [5], reduction in blood pressure [6,7], and increase in parasympathetic nerve activity [8,9]. In addition to its physical effects, forest therapy promotes mental, emotional, and physical well-being, as well as mindfulness [1,2,5,10].

Mindfulness refers to the ability to focus one's attention on the present moment while maintaining an attitude of acceptance, non-judgment, and non-reactivity. However, mindfulness has multiple definitions [11–15]. Throughout its history, the concept of mindfulness,

in the context of research and practice, has been investigated using various perspectives [16]. Given the various theoretical backgrounds and purposes, multiple types of measures are used to assess mindfulness, and various frameworks are used to define mindfulness based on distinct components [17].

Mindfulness has significant effects on health. Some studies have demonstrated the effectiveness of mindfulness in reducing stress [18], enhancing cognition [19,20], boosting the immune response [21], regulating emotional states [18,22], and reducing blood pressure [20,23,24].

Multiple studies have evaluated the associations of forest therapy with stress reduction, parasympathetic relaxation, and, indirectly, mindfulness in the natural environment [4]. However, most studies have evaluated mental health outcomes that are indirectly related to mindfulness instead of using scales to evaluate the effects of mindfulness in forest therapy [25]. These studies have suggested that additional evidence is needed to confirm the effects of forest therapy on mindfulness. In a 2022 systematic review on the mental and physical health effects of forest therapy, 1 of 17 studies used the Mindful Attention Awareness Scale-State to evaluate awareness [26]. Another systematic review of the effects of the natural environment, with or without mindfulness intervention, demonstrated that four tools were used to measure outcomes in the 25 included studies. The Five-Facet Mindfulness Questionnaire (FFMQ) was the most commonly used tool, although the Child and Adolescent Mindfulness Measure, Freiburg Mindfulness Inventory (FMI), and State Mindfulness Scale were also used [25].

Even in South Korea, where forest therapy has been extensively investigated, there are a lack of studies on the effects of forest therapy on mindfulness [1]. Most studies evaluating the effectiveness of mindfulness-based forest therapy did not use direct measures. However, these studies have shown that mindfulness experiences in the context of forest therapy improve mental health outcomes, such as anxiety [27], depression [5], and stress [28].

Several criteria must be fulfilled for a mindfulness measure to be suitable for use in a forest therapy context. The tool should include few questions [29] given the limitations imposed by forest environments. Furthermore, a brief assessment period is desirable to capture the effects of forest therapy in a timely manner [30]. Additionally, to comprehensively determine the sensations and mental experiences associated with forest therapy, as a form of mindfulness, the factor structure of the tool should be appropriate.

The FMI was one of the first mindfulness tools based on the fundamental Buddhist ideas of mindfulness, examining nonjudgmental present-moment observation and openness to unfavorable situations in meditators [31]. The primary version of the FMI has four interpretable factors with 30 items. Walach et al. [32] developed a short version of the FMI that is operationally independent of a Buddhist or meditation setting and is suitable for everyone. The short version of the FMI consists of 14 questions across two factors: presence and acceptance [33,34]. Presence represents a person's ability to be completely involved and attentive in the current moment. This is becoming more aware of one's thoughts, feelings, and physiological sensations without being overly preoccupied with the past or future [31]. Acceptance, in the context of mindfulness, is the ability to notice and recognize thoughts and feelings without judgment. It entails taking a non-judgmental and non-reactive attitude toward one's moments [34,35].

Therefore, the FMI is appropriate for examining the mindfulness-promoting effects of the forest environment. Compared to other mindfulness scales, the FMI is shorter (14 questions) and can be used to assess mindfulness over a relatively short time period. It is also suitable for capturing the feeling of "presence" associated with the lived experience, as well as the positive psychological changes that result from that experience, including the attitude of "acceptance".

The FMI has been translated into several languages and is commonly used in countries in Asia and Europe, such as Germany [35]. Researchers in numerous Asian countries, such as Turkey [36], China [37], and Japan [38], have conducted mindfulness research using

translated versions of the FMI, suggesting that this tool is applicable to Eastern cultures in addition to Western ones. However, the FMI has not been translated into Korean.

The purpose of this study was to translate the FMI into Korean and validate the translated version. During this process, we aimed to establish the factor structure of the Korean version of the FMI, such that it can be applied to assess mindfulness in the context of forest therapy.

2. Materials and Methods

2.1. Study Participants

To ensure that participants understood the concept of mindfulness, we enrolled individuals proficient in Korean. Non-Koreans and individuals with significant mental disorders who had poorly developed language skills were excluded.

In a previous validation study, 100–199, 200–299, 300–499, and ≥500 participants were deemed poor, fair, good, and very good [39]. Item response theory (IRT) posits that ≥100 participants are required to establish the validity of a scale [40,41]. However, some studies have suggested that ≥200 participants are required [42]. Therefore, we collected data from 352 healthy Korean individuals with no missing values.

2.2. Korean Version of the FMI

The FMI was translated in accordance with the International Testing Commission standards [43]. We obtained permission from the original author of the FMI to translate it into Korean. The initial translation of the FMI was conducted by an author proficient in both English and Korean, with a background in psychology. Then, the translation was reviewed by two mindfulness experts. After thorough discussion, a preliminary version of the FMI was back-translated by an expert bilingual translator who has psychology degree. All authors reached a final agreement, and the Korean version of the FMI is presented in Supplementary Materials S1.

2.3. Measures

We used the Beck Depression Inventory (BDI) [44], FFMQ [45], Korean Acceptance-Action Questionnaire-II (KAAQ) [46], and Positive Affect and Negative Affect Schedule (PANAS) [47] to evaluate the criterion validity of the original and translated FMI. The questionnaire contains 112 questions, which include sociodemographic factors, such as, sex, age, marital status, chronic illnesses, level of education, income, subjective social class, and province of residence.

In 2006, Baer et al., developed the FFMQ [48]. The FFMQ is an instrument that combines the various components of mindfulness suggested by different mindfulness experts. To describe the dimensional structure of mindfulness, Baer et al., conducted a joint factor analysis of five mindfulness measures. The FMI [32], Mindful Attention Awareness Scale [49], Kentucky Inventory of Mindfulness Skills [50], Cognitive and Affective Mindfulness Scale [51], and Mindfulness Questionnaire [52] were included in the analysis. Five factors were found as a result, which are 'acting with awareness', 'nonjudging', 'observing' 'nonreactivity', and 'describing'. The instrument contains 39 items. On a Likert scale of 1 to 5, 1 represents (never or very rarely true), 2 (rarely true), 3 (sometimes true), 4 (often true), and 5 (very often or always true). The mean of the item by the factor represents the advancement of the items that the subject measured. Also, the total mean score indicates the overall mindfulness score of the test taker. A higher score indicates that the person is more mindful. In 2006, the Korean version was translated by Won and Kim [45].

A self-report questionnaire, the Positive and Negative Affect Schedule (PANAS) assesses both positive and negative affect. According to Thompson, the PANAS consists of 20 items. Each of the 10 items in PANAS is made up of adjective terms that denote both positive and negative affect. The question asks, "Indicate the extent you have felt this way over the past week". Each item is evaluated on a five-point scale ranging from 1 (not at all)

to 5 (very much) [53]. A sum of each factor indicates the intensity of each affect. In 2016, Park and Lee undertook the development of the Korean version of PANAS [47].

The initial version of the BDI was published in 1961 and the latest version was updated in 1996. The BDI was developed following the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition criteria for diagnosing major depression. The assessment comprises a total of 21 items, with four distinct response options for each question, which vary in severity [54]. In 2011, BDI was translated into Korean [44].

2.4. Data Collection

Data were collected by a survey company between 17 and 20 October 2022. The data was collected by the 'Han-guk Research' company, a Korean data collection company. Participants were given a small amount of vouchers, which they may later donate to charity or exchange for cash or coupons for goods. The study protocol was approved by Seoul National University's Institutional Review Board (nos. 2210/002-021 and E2211/003-011).

2.5. Data Analysis

Descriptive analyses were performed for all variables. Exploratory factor analysis was conducted to examine the construct validity and factor structure of the FMI. Then, confirmatory factor analysis was performed to determine the optimal model. The chi-square test, comparative fit index (CFI), Tucker-Lewis index (TLI), and root mean square error of approximation (RMSEA) were used to assess the model fit. Satisfactory fit was indicated by CFI and TLI values > 0.90 [55] and RMSEA < 0.05 [56].

Next, we assessed the validity of each item based on the item response model. The polynomial data obtained from the FMI were analyzed using a rating scale model [57]. The criterion validity was assessed based on correlation analyses of FMI, BDI, FFMQ, KAAQ, and PANAS data. Statistical analyses were conducted using R software (version 4.2.0; R Development Core Team, Vienna, Austria).

3. Results

3.1. Participant Characteristics

Table 1 presents the baseline characteristics of the participants. This study enrolled 352 participants, including 175 males (49.7%) and 177 females (50.3%). There were no differences in the number of participants among age groups (20s: n = 71; 30s: n = 68; 40s: n = 70; 50s: n = 68; 60s and older: n = 75). Furthermore, 195 (55.4%), 105 (29.8%), and 75 (14.7%) individuals had none, one, and two or more chronic diseases, respectively. The chronic diseases were categorized using the Korea Centers for Disease Control and Prevention's Korea National Health and Nutrition Survey criteria [58]. The income levels were categorized into three groups. The residential region was classified as metropolitan (including Seoul, Kyunggi, and Incheon) or other. The subjective social class was categorized into four groups [59].

3.2. Descriptive Analysis of the FMI

The FMI, KAAQ, FFMQ, PANAS, and BDI had high Cronbach's alpha values (0.88, 0.85, 0.85, 0.9, and 0.92, respectively). Table 2 presents the English version of the items and the translated Korean version of the FMI, along with the descriptive statistics thereof. Item 13 exhibited a weak item-total correlation (r = 0.22).

3.3. Factor Analysis

We analyzed the factor structure of the model with all items (model A) and that without item 13 (model B). The scree plot demonstrated that the two- and three-factor structures were suitable (Supplementary Materials S2). Exploratory factor analysis was used to determine the factor loadings for each item. Table 3 presents the loading values. Confirmatory factor analysis was conducted using one-, two-, and three-factor models for model A, and one- and two-factor models for model B. Based on the exploratory factor

analysis, only item 6 in model 3A emerged as a distinct component. We did not select the three-factor model B because only one question evaluated a single factor. Table 4 presents the results of the confirmatory factor analysis of the goodness-of-fit of each model.

Table 1. Participant characteristics.

Item		*n*	Percentile (%)
Sex	Males	175	49.7
	Females	177	50.3
Age (y) M = 44.8 (14.53) (min–max: 20–78)	20–29	71	20.2
	30–39	68	19.3
	40–49	70	19.9
	50–59	68	19.3
	≥60	75	21.3
Chronic illnesses	None	195	55.4
	1	105	29.8
	≥2	52	14.7
Marital status	Married	191	54.3
	Single/other [1]	161	45.7
Income level [2]	Low	125	35.5
	Moderate	110	31.3
	High	117	33.2
Education	High school or below	81	23.0
	College or above	271	77.0
Region	Metropolitan area	216	61.4
	Other	136	38.6
Subjective social class	High (8–10)	22	6.3
	High-middle (6–7)	104	29.5
	Low-middle (4–5)	147	41.8
	Low (1–3)	79	22.4

[1] Separated, divorced, or widowed [2] Annual income: low, 0–360,000,000 KRW; moderate, 370,000,000–650,000,000 KRW; high, 660,000,000–2,400,000,000 KRW; average exchange rate for Q1 2022: 0.8 USD = 1000 KRW.

Table 2. Descriptive statistics for the FMI and reference measures.

	Item	Mean (Standard Deviation)	Corrected Item-Total Correlation	Distribution of Item Scores (%)			
				1	2	3	4
1	I am open to the experience of the present moment.	2.67 (0.79)	0.57	6.0	35.2	44.6	14.2
2	I sense my body, whether eating, cooking, cleaning or talking.	2.61 (0.82)	0.48	9.4	33.2	44.9	12.5
3	When I notice an absence of mind, I gently return to the experience of the here and now.	2.38 (0.84)	0.53	13.1	45.5	31.5	9.9
4	I am able to appreciate myself.	2.72 (0.87)	0.65	7.4	33.2	39.2	20.2

Table 2. *Cont.*

	Item	Mean (Standard Deviation)	Corrected Item-Total Correlation	Distribution of Item Scores (%)			
				1	**2**	**3**	**4**
5	I pay attention to what's behind my actions.	2.53 (0.86)	0.53	11.9	35.8	40.1	12.2
6	I see my mistakes and difficulties without judging them.	2.08 (0.84)	0.51	26.4	44.6	23.9	5.1
7	I feel connected to my experience in the here-and-now.	2.62 (0.79)	0.51	6.5	37.5	43.2	12.8
8	I accept unpleasant experiences.	2.38 (0.74)	0.51	8.2	53.4	30.7	7.7
9	I am friendly to myself when things go wrong.	2.19 (0.87)	0.51	23.0	41.8	28.4	6.8
10	I watch my feelings without getting lost in them.	2.44 (0.87)	0.63	16.2	33.5	40.6	9.7
11	In difficult situations, I can pause without immediately reacting.	2.39 (0.81)	0.65	13.6	40.3	39.2	6.8
12	I experience moments of inner peace and ease, even when things get hectic and stressful.	2.21 (0.85)	0.69	22.2	40.6	31.3	6.0
13	I am impatient with myself and with others.	3.09 (0.77)	0.22	1.7	20.7	44.9	32.7
14	I am able to smile when I notice how I sometimes make life difficult.	2.12 (0.81)	0.54	23.3	45.5	27.0	4.3

The translated Korean version of the FMI can be found in Supplementary Materials S1. Further descriptive statistic on each item is continued in Supplementary Materials S6.

Table 3. Factor loadings for each model.

Item	One-Factor Model (1A)	Two-Factor Model (2A)	Three-Factor Model (3A)	One-Factor Model without Item 13 (1B)	Two-Factor Model without Item 13 (2B)
1	0.59	0.67	0.67	0.60	0.67
2	0.49	0.59	0.61	0.50	0.59
3	0.56	0.59	0.59	0.56	0.59
4	0.67	0.69	0.71	0.67	0.69
5	0.56	0.62	0.62	0.57	0.62
6	0.54	0.54	1.00	0.55	0.54
7	0.51	0.62	0.61	0.52	0.62
8	0.54	0.53	0.52	0.54	0.53
9	0.57	0.59	0.60	0.57	0.59
10	0.69	0.73	0.72	0.68	0.72
11	0.72	0.79	0.78	0.72	0.78
12	0.76	0.83	0.82	0.75	0.82
13	0.28	0.33	0.32		
14	0.59	0.58	0.59	0.60	0.59

Table 4. Fit indices for each model.

	CFI	TLI	RMSEA	SRMR	χ^2	df
One-factor model	0.81	0.84	0.099 (0.086–0.11)	0.070	343.516	77
Two-factor model	0.90	0.92	0.072 (0.061–0.083)	0.059	214.461	76
Three-factor model	0.90	0.92	0.071 (0.06–0.083)	0.057	209.097	75
One-factor model without item 13	0.83	0.86	0.099 (0.087–0.111)	0.066	288.528	65
Two-factor model without item 13	0.92	0.93	0.069 (0.056–0.081)	0.053	169.908	64

The most appropriate model was the two-factor model, which excluded item 13. Both one-factor models, 1A (χ^2 [df] = 343.51 [77], CFI = 0.84, TLI = 0.81, RMSEA = 0.099) and 1B (χ^2 [df] = 288.53 [65], CFI = 0.86, TLI = 0.82, RMSEA = 0.099), demonstrated inadequate fit. The three-factor model demonstrated an acceptable fit (χ^2 [df] = 209.1 [75], CFI = 0.92, TLI = 0.9, RMSEA = 0.71). Both two-factor models also exhibited acceptable fits: 2A (χ^2 [df] = 214.46 [76], CFI = 0.92, TLI = 0.90, RMSEA = 0.072) and 2B (χ^2 [df] = 169.9 [64], CFI = 0.93, TLI = 0.92, RMSEA = 0.069).

The two-factor model was validated on the basis of the results of factor analysis, which demonstrated that item 13 should be excluded. After excluding item 13, the two-factor model exhibited the best fit.

3.4. Item Validation: Item Response Model

Table 5 presents the results of the IRT analysis of the rating scale model for the FMI with item 13 excluded. Supplementary Materials S3 and S5 presents the results of the IRT analysis with all items included. Supplementary Materials S4 presents the information curves for all items. Based on the IRT results, item 13 was considered inappropriate (infit = 1.43).

Table 5. Difficulty and fit of FMI items.

Item *	FMI One One-Factor Model (1A)			FMI Model without Item 13					
				One-Factor Model (1B)			Two-Factor Model (2B)		
	Difficulty	Outfit	Infit	Difficulty	Outfit	Infit	Difficulty	Outfit	Infit
6	−1.46	1.11	1.12	−1.39	1.09	1.10	−1.37	1.18	1.20
14	−1.56	1.00	1.01	−1.49	0.98	0.99	−1.84	1.13	1.14
9	−1.72	1.20	1.19	−1.65	1.15	1.14	−2.03	1.21	1.19
12	−1.77	0.90	0.89	−1.69	0.85	0.84	−2.09	0.83	0.83
8	−2.15	0.92	0.90	−2.06	0.87	0.86	−2.09	0.97	0.95
3	−2.17	1.06	1.05	−2.07	1.03	1.03	−2.10	1.07	1.07
11	−2.19	0.83	0.83	−2.09	0.79	0.78	−2.58	0.81	0.81
10	−2.29	1.01	1.01	−2.19	0.97	0.97	−2.71	1.03	1.04
5	−2.49	1.07	1.08	−2.38	1.06	1.07	−2.44	1.04	1.05
2	−2.67	1.10	1.09	−2.55	1.06	1.06	−2.62	0.99	0.99
7	−2.71	0.98	0.97	−2.59	0.96	0.95	−2.66	0.85	0.86
1	−2.82	0.91	0.90	−2.70	0.88	0.87	−2.78	0.85	0.86
4	−2.94	0.97	0.98	−2.81	0.94	0.95	−2.90	1.03	1.04
13				−3.65	1.53	1.43			

* Bolded and non-bolded items indicate different factors.

Using the two-factor model, which was considered appropriate based on the factor analysis, the difficulty level of factor 1 and 2 items was analyzed. All items showed appropriate fit.

3.5. Correlation Analysis

The unadjusted and adjusted Pearson's correlations are presented in Table 6. Adjustments were made for the following potential confounding variables: sex, age, place of residence, level of education, marital status, income, number of chronic conditions, and subjective social class. The FMI exhibited the strongest correlation with the FFMQ in the unadjusted correlation analysis (r = 0.61) compared to the adjusted correlation analysis (r = 0.43). All correlations exhibited reduced strength after adjustment.

Table 6. Unadjusted and adjusted correlations.

		Unadjusted Correlation Coefficient **					
		PANAS Negative	**PANAS Positive**	**FFMQ**	**KAAQ**	**FMI**	**BDI**
Adjusted correlation coefficient *	PANAS Negative	1.00	0.07 †	−0.41	−0.64	−0.23	0.52
	PANAS Positive	0.07 †	1.00	0.34	0.21	0.49	−0.38
	FFMQ	−0.25	0.22	1.00	0.55	0.61	−0.45
	KAAQ	−0.45	0.10	0.34	1.00	0.43	−0.58
	FMI	−0.16	0.32	0.43	0.26	1.00	−0.40
	BDI	0.35	−0.26	−0.28	−0.40	−0.28	1.00

† $p > 0.1$. * Adjusted for sex, age, area of residence, education level, marital status, income, number of chronic illnesses, and subjective social class. ** Colored table shows unadjusted correlation.

4. Discussion

This study translated and validated the FMI into Korean. The responses of 352 healthy Korean adults were analyzed for validation. A Cronbach's alpha coefficient of 0.88 was determined to be indicative of high reliability. Item 13 had a low correlation with the aggregate score, according to descriptive statistics, indicating that it may be distinct from the other items. Further factor analysis revealed that a two-factor model without item 13 yielded the most accurate results. As a result, item 13 was regarded as suitable for exclusion. Moreover, this decision was substantiated by item response theory analysis, which demonstrated acceptable fit for all items except item 13. After combining our results, we concluded that the translated Korean version of the FMI, which is composed of two factors and excludes item 13, is reasonable. For mindfulness and mental health research among Korean populations, the Korean version FMI may be utilized as a useful tool in the future.

4.1. Psychometric Properties of the FMI

This study has a strong overall reliability coefficient, with a Cronbach's alpha value of 0.88. Based on the findings of the item response and factor analysis, it was determined that the validity of item 13 is insufficient. These findings are in line with the original version of the FMI, in which item 13 had the lowest factor loading [60].

There could be several possibilities why question 13 does not fit well. Initially, item 13 is the only reverse-scored item, which may explain the misfit. The item is the only reverse question out of 14 questions, which is positioned in the last section and could lead to participants being confused [61]. A previous validation study of the FMI demonstrated a similar result and suggested removing question 13. The low fit was consistently observed in both Japan [38] and the UK [35], leading to the decision to exclude item 13. Similarly, in the case of China, translations were completed for all items except item 13 [37].

The poor fit of item 13 is attributable to cultural differences [62] or potential facets of mindfulness. Despite contributions from multiple translators proficient in both English and Korean, historical, societal, and linguistic aspects of words and nuances may be altered during translation [63,64]. However, the same result on item 13 was observed in multiple

countries. A plausible explanation from the previous research group is that the respondents might not perceive item 13 as an inverted item into mindfulness, it could instead reflect 'mindlessness'. Which has a different construct from mindfulness [33]. Considering these varied circumstances, item 13 should be excluded from future usages of the FMI.

The two-factor model is determined to be the most appropriate factor structure, regardless of item 13. "Presence" and "acceptance" are the two factors, respectively. We identified a distinct factor structure of the FMI relative to previous studies. A study conducted in the UK assigned items 1–3, 5, and 7 to the first factor and items 4, 6, 8, 9–12, and 14 to the second factor [33]. Conversely, a Korean study assigned items 1–8 to the first factor and items 9–12 and 14 to the second factor. Based on previous validation studies and early development studies, factor 1 indicates "presence" and factor 2 indicates "acceptance" in this Korean study [33,34]. Depending on the historical, social, and cultural setting, these facets may have different compositions. All researchers did, however, concur that the two factors were "presence" and "acceptance," as they had been identified in earlier research [33].

The FMI did not meet the assumption of one-dimensionality. However, in order to ascertain whether the data supported the hierarchy of item difficulties, a one-factorial Rasch model was constructed excluding item 13. Notwithstanding this limitation, it might facilitate the derivation of a hierarchy of item difficulty. The average difficulty of the acceptance items was −1.91, while the average difficulty of the presence items was −2.43. Consistent with previous research [34], this significant disparity of roughly 0.5 logits indicates that, as anticipated, presence items are more readily endorsed than acceptance items. All of the analyses conducted to assess concurrent validity revealed significant correlations. Notably, the highest correlation was observed with FFMQ (r = 0.43), a measure of mindfulness. Regarding the FMI, it encompasses two factors: presence and acceptance. FFMQ gauges mindfulness through factors like Awareness, Nonjudging, Observing, Nonreactivity, and Describing [45]. Additionally, a compelling correlation was found between KAAQ, measuring only acceptance (r = 0.26), and positive affect (PANAS), which evaluates positive emotions (r = 0.32). However, in the case of BDI, which measures depression (r = −0.28) and negative affect (PANAS), assessing negative emotions (r = −0.16) exhibited a strong negative correlation with the FMI.

4.2. Future Application of the FMI

It is determined that the FMI has a high potential for active application in future mental health research. Examining insights from previous research, particularly in mindfulness, reveals substantial evidence linking mindfulness to the moderation of various mental conditions, including stress, depression, and anxiety [25,65,66]. As such, mindfulness has gained recognition as a pivotal element in mental health, alongside subjective factors like quality of life. As a result, the FMI will make a significant contribution to the field of mental health research.

Also, presence and acceptance are two factors from the FMI, which is integral to mindfulness, that are identified as crucial components obtained through exposure to nature [13,66]. Thus, the FMI will function as an exceptional instrument for investigating the concept of mindfulness in the context of nature-based therapy.

4.3. Limitation

This study had some limitations, including a small sample size [67] and the absence of a test-retest reliability assessment [68]. Some scholars argue that a sample size of >540 is necessary for IRT analysis, such that the collection and verification of further data is needed for a comprehensive evaluation. Additionally, it is important to note that the data were obtained from the general population rather than individuals who have undergone forest therapy. Therefore, it is necessary to conduct further investigation within a forest therapy environment.

5. Conclusions

This study translated the FMI into Korean and then validated it. The factor analysis revealed that the two-factor structure was suitable. However, item 13 correlated with distinct factors, suggesting incompatibility for the Korean population. Hence, item 13 was excluded from the Korean version of the FMI. The Korean version of the FMI provides opportunities for research on mindfulness and related mental health diseases within the Korean cultural context.

Supplementary Materials: The following supporting information can be downloaded at: https://www.mdpi.com/article/10.3390/f15030472/s1, Supplementary Materials S1: Korean Version FMI. Supplementary Materials S2: Scree plot. Supplementary Materials S3: Item Characteristic Curve. Supplementary Materials S4: Information Curve. Supplementary Materials S5: Expected Score Curve. Supplementary Materials S6: Descriptive statistics continued from Table 2.

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Data Availability Statement: The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request. The Korean version of the FMI is publicly available.

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Conflicts of Interest: All authors consented to the publication of this article, and the participants also provided informed consent. The original author of the FMI consented to the publication of the Korean version of the instrument. The authors declare that they have no competing interests.

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