

## Exploring the Factor Structure and Psychometric Properties of the Beck Cognitive Insight Scale in Schizophrenic Patients

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### Abstract

**Background:** Insight holds pivotal significance in the recovery process for individuals dealing with mental health conditions. The Beck Cognitive Insight Scale (BCIS) is the most prevalent and well-recognized tool for assessing cognitive insight in individuals suffering from mental health disorders. This study aimed to perform cross-cultural validation and explore the factorial structure of the Beck Cognitive Insight Scale (BCIS) in Pakistani schizophrenia patients.

**Method:** This study used purposive sampling and a cross-sectional research design. It encompassed two phases: (1) a pilot study and (2) a main study. In the pilot phase, the standard translation method was employed to translate and examine the cross-cultural validation of the BCIS scale. In the main study phase, the primary objective was to investigate the construct validity and internal consistency of the Urdu-BCIS scale. One hundred diagnosed schizophrenia patients, ages ranging from 20 to 60 years ( $M = 31$ ,  $SD = 8.02$ ), were recruited at psychiatrist wards from various hospitals in Rawalpindi and Islamabad, Pakistan, between August and October 2022.

**Results:** The results of the exploratory factor analysis (EFA) revealed a novel structure of the BCIS in the Pakistani context. Two factors were identified as similar to the original structure but with significantly different factor loadings. The study established test-retest reliability, content validity, and construct validity in schizophrenic patients. These findings strongly support the appropriateness of the Urdu-BCIS version for clinical practice in the Pakistani context.

**Conclusions:** The study examined the scale and uncovered a novel factor structure that deviates from the original version. This study strongly supports the Urdu version of the BCIS as a reliable and valid clinical instrument for examining cognitive insight in Pakistani clinical settings. This cross-cultural validation highlighted a substantial stride in improving our vision and examination of cognitive insight in the Pakistani sample.

**Keywords:** Beck cognitive insight scale, psychometric properties, cognitive insight, cross-cultural validation, schizophrenia

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## Background

Schizophrenia is a profoundly debilitating and chronic mental health problem that affects over 20 million people globally (World Health Organisation, 2022; Wabbeh & Avramopoulos, 2021; Novak et al., 2016; Magwai et al., 2021). This problem is prevalent and ranks as the fourth most important cause of mental disability on a worldwide scale (Mathew, 2022; Beyene et al., 2021). People suffering from psychosis experience significant challenges and problems in their ability to introspect related to their cognitive problems, identify errors, and rectify them (Riggs et al., 2010). When people in this condition experience that they are being pressured and forcefully to take services and medication for a situation they don't personally acknowledge, they commonly decline help or agree to it solely, temporarily, with the intention of recuperating their autonomy, whether it means quitting the hospital and improving social pressures (Amador & Kronengold, 2004). In low- and middle-income countries such as Pakistan, psychotic patients are typically misinterpreted as being under the pressure of ghostly spirits because of their dearth of proper insight into their present situation (World Health Organisation, 2022).

Insight plays an imperative role in the recovery of people living with mental health problems (Raftery et al., 2019; Connolly Gibsons et al., 2007; Ghaemi et al., 2000; Van Camp et al., 2017). It is a complex concept that was initially proposed by Lewis (1934) as "the degree of awareness a patient possesses related to their own situation." This idea, referred to as clinical insight, was continually expanded to encompass cognitive insight that concerns the ability to examine the constrictions of one's own beliefs and thoughts (Gonzalez-Blanch et al., 2021; Beck et al., 2004; Riggs et al., 2010). Cognitive insight has been associated with different mental health-related problems, including delusions, hallucinations, negative symptoms, affective symptoms, and neurocognition (Gonzalez-Blanch et al., 2021; Buchy et al., 2009; Engh et al., 2010; Bora et al., 2007; Tranulis et al., 2008; Colis et al., 2006; Garcia-Mieres et al., 2020; Nair et al., 2014). This concept was originally developed for patients with psychotic disorders, cognitive insight has commonly been examined in people with other psychiatric problems and even in those without psychological problems (Saguem et al., 2022).

Cognitive insight also encompasses two important concepts: (1) self-reflectiveness and (2) self-certainty. Being more self-reflective means that a person can more effectively contemplate different perspectives and evaluate alternative assumptions to arrive at well-considered inferences. Conversely, being excessively self-certain reflects that a person is excessively confident in their beliefs. This idea sets itself apart from clinical insight by not solely including the evaluation of mental health problems but also comprising knowledge of one's thought processes and styles of reasoning (Van Camp et al., 2017; Beck et al., 2004; Jorgensen et al., 2015).

The Beck Cognitive Insight Scale (BCIS) was devised to examine an individual's perception of their past errors or biases and their ability for impartiality in relation to their present delusional thoughts or beliefs. It further evaluates their capacity to characteristic incorrect

explanations or inferences to others and their willingness to admit corrective knowledge from others. Responses give ratings on a four-point Likert scale, with options ranging from 0 (strongly disagree) to 3 (strongly agree). The BCIS encompasses two subsets, including the first, self-reflectiveness, which comprises items examining objectivity, openness, and introspection in taking feedback. The second is self-certainty which examines the level of conviction a person has in their own thoughts and beliefs. (Beck et al., 2004).

The BCIS has been translated into different other languages worldwide, such as Norwegian (Engh et al., 2007), Korean (Kim et al., 2007), French (Favrod et al., 2008), Japanese (Uchida et al., 2009), Spanish (Carlson et al., 2009), Taiwanese (Kao & Liu, 2010), Tamil (Merlin et al., 2012), Malay (Othman & Lua, 2017), and Arabic (Saguem et al., 2022). However, it's worth observing that there has not been any recognized study to cross-culturally validate the psychometric properties of the Urdu translation of this scale. This is a noteworthy gap to address, as Urdu is the Pakistani national language and is spoken by approximately 5% of the international population (Munawar et al., 2021).

The main aim of the present research is to fill this void by cross-culturally validating the BCIS Urdu version and further examining its factor structure. Many other researchers have endeavored to explore the factor structure and establish psychometric properties of the scale, and the above-mentioned results have been summarized and comprehensively mentioned in Table 1.

## Method

### Research design

This study utilized a purposive sampling technique and a cross-sectional research design. It consisted of two phases: a preliminary study and a main study. In the initial pilot research phase, the back standard translation method was employed to translate and examine the cross-language validity of the BCIS scale in the Pakistani sample (Anderson & Brislin, 1976; Hambleton, 1994). In the main study phase, this study aimed to explore the construct validity and internal consistency of the BCIS. Exploratory factor analysis (EFA) and Pearson correlation analysis were used to establish construct validity in the schizophrenic population.

### Translation and Cross-Cultural Validation of the Beck Cognitive Insight Scale

The standard back translation method was used for cross-language validation of the BCIS, which encompassed a comprehensive two-stage process that included forward and back translation methods. In the forward translation method, which included a subject matter expert (SME) and translation from English to Urdu language, On the other hand, the back translation method also comprised another round of committee approaches and translation from Urdu to English language. The primary aim was to establish a culturally appropriate and, linguistically, theoretically sound version of BCIS-Urdu for the Pakistani population. The emphasis lay on accomplishing cross-cultural and conceptual equivalence rather than strictly following literal or linguistic equivalence.

In the initial stage, which is known as forward

translation method, this study enlisted the three bilingual experts from Foundation University with research and clinical experience. They were requested to translate the BCIS scale from original English to Urdu, with an explicit focus on conceptual and theoretical accuracy rather than strict adherence to factual details. Additionally, the translations were made with conciseness and clarity to confirm comprehensibility in the Pakistani population. Notably, they also requested that no terminology offensive to Pakistani culture be included in the translations. Forward translation was performed in following stages, in the first stage, the SME committee approach was carried out by three bilingual experts. These professionals meticulously went through both translation versions to assess the precision and cultural suitability of the translations. Their examination took into account explanation considerations including grammar, phrasing, context, and the meaning of the items. Next, the committee members have consensus on the selection of the most appropriate translated items based on their professional findings.

In the second stage, which is known as the backward translation method, we recruited three more bilingual experts from Foundation University, and they had clinical experience. They were requested to translate the BCIS scale from Urdu to English, with an explicit focus on conceptual and theoretical accuracy rather than strict adherence to factual details. The committee approach was also conducted with the same process and instructions. Cross-language validation plays a very important role in language equivalence and contextual appropriateness. Therefore, cross-language validation becomes crucial to confirm the translated version's efficacy in its proposed language. This cross-cultural validation process was performed in both the pilot and the main study.

### **Participants**

This study was carried out in two phases. In the primary pilot study phase, fifty undergrad BS programme students were recruited from the same class at the department of psychology at Foundation University School of Science and Technology, Pakistan. These students were bilingual, having proficient knowledge in both Urdu and English. These participants were included in the present study for the special purpose of cross-language validation of the BCIS. In the main study phase, one hundred diagnosed schizophrenia patients, 35 male and 65 female, with ages ranging from 20 to 60 years ( $M = 31$ ,  $SD = 8.02$ ), were recruited at psychiatrist wards from various hospitals in Rawalpindi and Islamabad, Pakistan, between August and October 2022. Both inpatients and outpatients were included in the present study.

### **Procedure**

This study was approved by the Institutional Review Board of the Psychology Department, Foundation University School of Science and Technology, Pakistan, and followed the guidelines of the American Psychological Association. This study was conducted in two phases. For the purpose of cross-language validation and establishing test-retest reliability, fifty students, who were proficient in both English and Urdu, were recruited from FUSST University, Pakistan. These students were divided into two equal groups, each comprised of 25 students. Both the Urdu and English-translated versions of the BCIS to examine cross-language validation. Participants in both groups were re-examined

after a 15-day interval, almost two weeks later. This standard procedure was used to examine and develop the psychometric properties of both the Urdu and English versions of the BCIS.

In the main study, 100 diagnosed schizophrenia patients were recruited from various hospitals in Rawalpindi and Islamabad, Pakistan. This study identified potential patients who fulfilled the specified inclusion criteria and extended invitations to them to take part in the study. Those participants who volunteered to participate received standard forms containing all the necessary information. Before starting the study, participants were handed a handover scale with an explanatory statement, and both verbal and written informed consent were obtained from study participants. Participants were also assured that their personal information would be kept confidential and used only for research purposes. Moreover, item total correlation, person correlation, and EFA analyses were used to analyze alpha Cronbach reliability, construct validity, and test retest reliability using the Statistical Package for Social Sciences 20.

## **Results**

### **Pilot study**

The results exhibited in Table 2 demonstrated the outcomes of the cross-language validation for the BCIS-Urdu version, which included both its total score and subscale scores for the student sample. The table exhibited a strong Cronbach's alpha reliability of the total scale was 0.74, showing a respectable level of internal consistency between subscales and total scores. Furthermore, the Pearson correlation coefficient for the total scale was 0.89, signifying robust test-retest reliability. This study's results reflect a strong relationship between the Urdu and English versions of BCIS, which indicated robust test-retest reliability with the present sample.

### **Main study**

The results in Table 3 revealed that the item total correlation for all 15 items, which includes both subscales of self-reflectiveness and self-certainty, was notably significant for schizophrenic patients. These results highlighted the strong relationship between all BCIS-Urdu items and the overall scores which reflected a high level of internal consistency in the scale for schizophrenic patients. Additionally, the Pearson correlation coefficient revealed a robust association between items and the overall total scale of BCIS-Urdu, confirming internal consistency.

### **Construct validity**

The purpose of the present study was to examine the latent factor structure of the BCIS-Urdu version for schizophrenic patients and explore whether any modifications occurred in its cross-cultural adaptation. The sample size of the present study is five times greater than the number of items on the scale. The Kaiser-Meyer-Olkin (KMO) value of 0.60 exhibited that the association between factors was adequate to establish reliable factors.

**Table 1***Characteristics of studies investigating the structure of Beck Cognitive Insight Scale*

<b>Author</b>	<b>Sample size</b>	<b>Sample type</b>	<b>Language</b>	<b>Factors</b>	<b>Analysis</b>
Beck et al. (2004)	150	Clinical	English	2	EFA
Kim et al. (2007)	78	Clinical	Korean	2	EFA
Favrod et al. (2008)	158	Clinical	French	2	CFA
Uchida et al. (2009)	183	Clinical	Japanese	2	CFA
Kao & Liu (2010)	180	Clinical	Taiwanese	2	EFA
Merlin et al. (2012)	150	Clinical	Tamil	4	EFA
Gutierrez-Zotes et al. (2012)	129	Clinical	Spanish	2	CFA, EFA
Raftery et al. (2019)	312	Clinical (SUD)	English	2	CFA
Saguem et al. (2022)	150	Clinical	Arabic	2	CFA

*Note.* EFA = Exploratory Factor Analysis, SUD = Substance Use Disorder, CFA = Confirmatory Factor Analysis.

**Table 2**

*Mean and standard deviation, correlation coefficient of the Urdu and English versions of the Beck Cognitive Insight Scale (N = 50).*

<b>BCIS-Urdu</b>	<b>Test(English)</b>	<b>Retest(Urdu)</b>	<b>Correlation Coefficient</b>	<b>p-value</b>
<b>Self-Reflectiveness (Maximum Score:27)</b>				
Mean	12.09	12.19	.87	.000
SD	4.0	3.81		
Range	0-27	0-27		
<b>Self-Certainty (Maximum Score:18)</b>				
Mean	9.47	9.45	.84	.000
SD	2.67	2.69		
Range	0-18	0-18		
<b>Total (Maximum Score:45)</b>				
Mean	21.55	21.64	.89	.000
SD	5.77	5.7		
Range	0-45	0-45		

*Note.* \* p < .05; \*\* p < .01; \*\*\* p < .001.

**Table 3***Item total correlation for BCIS-Urdu in schizophrenic patients (N = 100)*

Scale items	BCIS-Urdu r	SR r	SC r
BCIS1	.52**	.52**	
BCIS2	.30**		.47**
BCIS3	.68**	.66**	
BCIS4	.39**	.31**	
BCIS5	.41**	.61**	
BCIS6	.58**	.67**	
BCIS7	.52**		.70**
BCIS8	.36**	.47**	
BCIS9	.36**		.61**
BCIS10	.49**		.56**
BCIS11	.60**		.63**
BCIS12	.34**	.57**	
BCIS13	.26**		.57**
BCIS14	.36**	.57**	
BCIS15	.34**	.54**	

*Notes.* BCIS = Beck Cognitive Insight Scale; SC = Self-certainty; SR = Self-reflectiveness; \*\* p < 0.01.

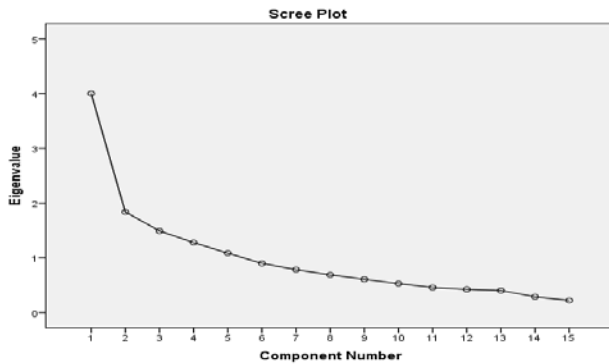
**Table 4**

*Factor Loadings of 15 items through the Principle Component Analysis by using the Direct Oblimion Method for BCIS-Urdu in schizophrenic patients (N = 100)*

Items	n	Score range	M (SD)	S	K		Factors	
1	100	0-3	1.13(1.1)	1.2	1.8	At times, I have misunderstood other people's attitudes towards me.	0.47	0.42
2	100	0-3	2.46(0.82)	0.68	2.83	My interpretations of my experiences are definitely right.		0.73
3	100	0-3	1.22(1.49)	1.72	2.58	Other people can understand the cause of my unusual experiences better than I can.	0.62	
4	100	0-3	2.21(1.25)	0.1	0.22	I have jumped to conclusions too fast.		0.53
5	100	0-3	0.96(1.17)	1.4	1.77	Some of my experiences that have seemed very real may have been due to my imagination.	0.62	
6	100	0-3	1.18(1.19)	1.16	1.18	Some of the ideas I was certain were true turned out to be false.	0.64	
7	100	0-3	1.91(1.07)	0.37	1.3	If something feels right, it means that it is right.	0.60	
8	100	0-3	1.34(1.07)	0.76	0.69	Even though I feel strongly that I am right, I could be wrong.	0.47	
9	100	0-3	2.49(0.89)	- 0.31	1.22	I know better than anyone else what my problems are.		0.75
10	100	0-3	2.31(0.83)	0.22	1.71	When people disagree with me, they are generally wrong.	0.45	
11	100	0-3	2.21(0.96)	- 0.37	- 0.27	I cannot trust other people's opinion about my experiences.	0.60	
12	100	0-3	1.3(0.97)	0.59	- 0.34	If somebody points out that my beliefs are wrong, I am willing to consider it.	0.58	
13	100	0-3	2.42(0.87)	0.33	0.35	I can trust my own judgment at all times.	0.60	
14	100	0-3	1.76(1.1)	0.27	- 0.31	There is often more than one possible explanation for why people act the way they do.	0.53	
15	100	0-3	1.14(0.85)	0.22	-0.7	My unusual experiences may be due to my being extremely upset or stressed.	0.65	
Eigenvalues							4.00	1.84
% of variance							26.67	12.25
Cumulative variance							26.67	38.92

*Notes.* S = skewness; K = kurtosis; factor 1 = self-reflectiveness; factor 2 = self-certainty.

**Figure 1.** Scree plot showing a two factor solution for BCIS-Urdu



Moreover, Bartlett's test of sphericity,  $\chi^2 (105) = 442.192$ , yielded significance at  $p < 0.000$ , ensuring the suitability of the sample for factor analysis.

EFA Initially, five factors were suggested based on eigenvalues higher than one. Conversely, two factors were identified that explained a cumulative variance of 37.581% of the total variance. Furthermore, mean standard deviations, skewness, and kurtosis values were obtained to examine the normality of the data. The results in Table 4 exhibit the descriptive values, which show a normal distribution.

### Content validity

After performing EFA analysis, two subject matter experts (SMEs) were requested to assign the original factor, which was retained in the present study. Particularly, the self-reflectiveness subscale encompasses 12 items 1, 3, 5, 6, 7, 8, 10, 11, 12, 13, 14, and 15, whereas the self-certainty subscale consists of 3 items 2, 4, and 9. Particularly, items 7, 10, 11, and 13 were recognized as reverse-scored items in the analysis for schizophrenic patients.

The results exhibited Cronbach reliability on the overall scale of  $\alpha = 0.761$ , which confirms the internal consistency of the BCIS-Urdu version in the schizophrenic sample. The alpha-Cronbach reliability of both new factors as self-reflectiveness and self-certainty subscales was 0.81 and 0.51, respectively. Which is also provided for validity in the current sample.

### Discussion

The present study aimed to investigate the factor structure and establish the psychometric properties of the BCIS in Pakistani-diagnosed schizophrenia patients. The results of this study provide compelling evidence supporting the validity and reliability of the BCIS-Urdu version as a clinical tool for assessing cognitive insight in schizophrenia patients. Notably, this study exhibited the first cross-cultural validation of the BCIS-Urdu version developed for the Pakistani sample. Test-retest reliability was also developed, confirming the tool's consistency over time in the Pakistani context. Additionally, these study results confirmed the robust internal consistency of the BCIS-Urdu and were aligned with many previous studies (Gonzalez-Blanch et al., 2021; Buchy et al., 2009; Tranulis et al., 2008; Colis et al., 2006; Garcia-Mieres et al., 2020).

Exploratory factor analysis (EFA) unveiled and identified two factor structures that mutually accounted for 38.92% of the variance, which closely reflect the original structure of the BCIS scale. Remarkably, each item exhibited factor loadings superior to the threshold of 0.3 in

the study, revealing their robust contribution to the factorial structure. However, it's worth emphasizing that the structure of cognitive insight fields, as delineated through factor analysis, revealed slight disparities from the original scale. Particularly, four items, such as 7, 10, 11, and 13, primarily classified under the self-certainty subset, exposed more significant loadings on the self-reflectiveness subset in the present study sample. Conversely, item 4 was originally developed and placed in the self-reflectiveness subset that was found to load onto the self-certainty subset in the current study (Merlin et al., 2012; Othman & Lua, 2017; Saguem et al., 2022). Significantly, the construct validity of BCIS-Urdu was developed, supporting the reliability of the scale's measurement. Likewise, content validity was established through consultation with SMEs. This study's findings firmly support the reliability and validity of the BCIS Urdu version for application in a Pakistani schizophrenic sample.

### Limitations and Implications

Although the valuable insights and awareness gained from the present research warrant acknowledgement, there are several drawbacks. This study population unveiled limited cultural and clinical diversity, and the exclusion of profoundly schizophrenic patients who were unable to report in this study might restrict and raise the generalizability issue of the results. Future studies should be conducted to explain these restrictions by including a more representative and diverse population that spans the whole Pakistani sample.

### Conclusion

This study strongly supports the Urdu version of the BCIS as a reliable and valid clinical instrument for examining cognitive insight in Pakistani schizophrenia. This cross-cultural validation highlighted a substantial stride in improving our vision and examination of cognitive insight in the Pakistani sample. Nonetheless, it is very crucial that upcoming research endeavors expand and focus more on population diversity, which encompasses persons with varying degrees of disorder severity, to further encourage the applicability and generalization of scale. This study also confirmed that the Urdu-BCIS version was a reliable and valid tool for the Pakistani schizophrenic population.

### Ethical Consideration

The study was approved by Department of Psychology, Foundation University School of Science and Technology, Pakistan. Consent Form was taken before taking data and participants were asked to take voluntary participation.

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### Availability of data and materials

The data sets used and analyzed during the current study are available from the corresponding author on reasonable request.

### Authors' contributions/Author details

Parsa Waqar Abbasi performed this study under the guidelines of Muhammad Aqeel.

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