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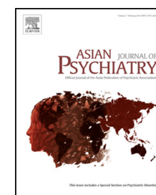

Validation of the Malayalam version of the Internalized Stigma of Mental Illness (ISMI) scale

Tintu James [a,b], V. Raman Kutty [b], Jennifer Boyd [c,d], Patrick Brzoska [e,*]

[a] NOVA Group of Institutions, Ernakulam, India
[b] Sree Chitra Thirunal Institute for Medical Sciences and Technology, Thiruvananthapuram, India
[c] Mental Health Service, San Francisco Veterans Affairs Health Care System, San Francisco, CA, USA
[d] Department of Psychiatry, University of California, San Francisco, San Francisco, CA, USA
[e] Chemnitz University of Technology, Faculty of Behavioral and Social Sciences, Institute of Sociology, Chemnitz, Germany

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ABSTRACT

Little is known about internalized stigma of mental illness in India. A reason for this could be the lack of valid assessment instruments adapted for the diverse cultures and languages of the country. One of the most widely used and accepted questionnaires to assess internalized stigma is the 29-item Internalized Stigma of Mental Illness (ISMI) scale. The aim of the present study was to translate and adapt the ISMI to the Malayalam-speaking population of Kerala, India and to assess its content and factorial validity. The content validity of the Malayalam-language ISMI was studied through interviews with 7 experts on stigma in India. Factorial validity was examined by means of a confirmatory factor analysis (CFA) based on a cross-sectional survey among 290 patients with mental illness attending follow-up outpatient and primary care clinics in Kerala, India. The expert panel concluded that the items of the translated questionnaire adequately represent internalized stigma in the Malayalam-speaking population of Kerala. The theorized factor structure of the ISMI consisting of five factors showed a suboptimal model fit (WRMR = 0.940; TLI = 0.971, CFI = 0.948; RMSEA = 0.059) which improved considerably after removal of the stigma resistance factor and three items with poor factor loadings (WRMR = 0.819; TLI = 0.982, CFI = 0.966; RMSEA = 0.051). Although our study identifies some sources of model ill-fit, it shows that a reduced version of the Malayalam-language ISMI can be a valuable tool for the study of internalized stigma in this cultural setting.

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1. Introduction

Stigma of mental illness manifests in the form of public stigma and personal stigma. Public stigma is the reaction that people show towards those with mental illness. Personal stigma can be perceived stigma (society's feelings about the stigmatized group), experienced stigma (individual experience of discrimination) or internalized stigma (internalization of public stigma resulting in self-stigmatization) (Corrigan and Watson, 2002).

Internalized stigma, also referred to as self-stigma, is the "*the devaluation, shame, secrecy and withdrawal triggered by applying negative stereotypes to oneself*" (Ritsher et al., 2003, p. 32). Internalization of stigma occurs in three steps: the individual slowly accumulates the public stereotypes towards mental illness *(stereotype awareness)*, gradually loses his/her reality and agrees with society's beliefs *(stereotype agreement)*, and changes his/her behavior accordingly *(stereotype concurrence)* (Watson et al., 2007). Psychosocial factors such as hope and social support have been found across multiple studies to have a consistent and negative correlation with internalized stigma, whereas socio-demographic factors have not been associated consistently (Livingston and Boyd, 2010). Internalized stigma can have negative effects on adherence, self-efficacy, quality of life and personal life by preventing people with mental illness from enjoying their basic rights and needs, leading to problems in finding a job or causing marital disruptions (Watson et al., 2007; Corrigan et al., 2006, 2013). Internalized stigma is also a barrier for mentally ill patients to avail treatment early. As a result, the recovery period of patients may be prolonged and they may experience complications and face serious financial difficulties (Boyd et al., 2010).

The internalized stigma of mental illness has been studied using various methods (Link et al., 1997) and there are a number of quantitative questionnaires available measuring the internalized stigma among people with mental illness (Livingston and Boyd,

* Corresponding author. Tel.: +49 371 531 36179; fax: +49 371 531 836179.
E-mail address: patrick.brzoska@soziologie.tu-chemnitz.de (P. Brzoska).

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2010; Brohan et al., 2010). One of the most commonly applied questionnaires is the 29-item Internalized Stigma of Mental Illness (ISMI) scale developed by Boyd (formerly Ritsher) and colleagues (Ritsher et al., 2003). The ISMI measures the subjective experiences of stigma and can be applied to people with various mental disorders. The ISMI has been translated in over 50 languages and has been found to be valid and reliable in different cultural settings (Boyd et al., 2014). It consists of five domains (sub-scales): alienation, stereotype endorsement, discrimination experience, social withdrawal, and stigma resistance. The *alienation* domain (six items) measures the subjective experience of being less than a full member of society. The *stereotype endorsement* domain (seven items) captures the extent to which participants agree with stereotypes about people with mental illness. The *discrimination experience* domain (five items) assesses participants' perception of how they are discriminated against. The *social withdrawal* domain (six items) aims to measure the extent to which individuals try to isolate themselves due to stigma. The *stigma resistance* domain measures the degree to which individuals can lead a happy life despite their experience of stigma. Each item of the ISMI provides a four-point Likert response format comprising the response options "strongly disagree", "disagree", "agree" and "strongly agree".

While many studies have been conducted on different aspect of mental illness in India, studies examining perceived and experienced stigma of patients in India are usually qualitative or limited to certain conditions such as schizophrenia (Loganathan and Murthy, 2008; Thara and Srinivasan, 2000). As far as we know, no quantitative assessment of internalized stigma of mental illness, including its prevalence and determinants, has been conducted in India. One reason for this might be that validated instruments for the assessment of internalized stigma among speakers of the different languages in that country are scarce. To the best of our knowledge, aside from Tamil and Bengali only an ISMI version for the Hindi-speaking population of India is available (Boyd et al., 2014). However, large proportions of the Indian population, particularly in Southern states such as Kerala, have little proficiency of Hindi and other languages, which is why the questionnaire cannot be applied there. With its population of 33.3 million mainly Malayalam-speaking people, Kerala is a state in the forefront of epidemiological transition (i.e., the transition from communicable to non-communicable disease including mental illness) in India and, in comparison to the other Indian states, has the largest proportion of those with several major risk factors for chronic diseases, including mental disorders (Thankappan et al., 2010). In 2008, Kerala recorded the fourth highest suicide rate in India (25.2 per 100,000 of the population), two and a half times the national average. Depression as well as risk factors for mental conditions such as divorce, family and marriage breakdowns and demographic ageing are also very prevalent in Kerala (Bary, 2008). Studying internalized stigma in this context is very important as stigma is one of the factors that may lead to delays in seeking appropriate treatment for mental health conditions. For this purpose, a validated assessment tool is necessary. The aim of our present study was to make the ISMI applicable to this population by translating and adapting the questionnaire to the cultural setting of Kerala, India, and assessing both its content and factorial validity.

2. Methods

2.1. Translation and adaptation of the Internalized Stigma of Mental Illness (ISMI) scale

The original ISMI was translated and adapted for the population of Kerala, India following published guidelines (Beaton et al., 2000). For this purpose, it was translated from English to Malayalam using forward and backward translation. The backward translation was reviewed by Dr. Jennifer Boyd, the developer of the original ISMI. Based on the evaluation of the backward translation, some nuances in the meaning of the Malayalam items were adjusted to better reflect the meaning of the original items. No items were added or subtracted for cultural reasons at this stage. The translated Malayalam-language ISMI (see Fig. 1; see Appendix for the original English language version) was pilot tested among 20 patients attending follow-up outpatient clinics in a community health centre and a primary health centre in Kerala. The pilot test did not identify any problems in the usability of the questionnaire.

2.2. Content validity

To examine the content validity of the Malayalam-language ISMI, the translated questionnaire was given to native speakers of Malayalam who are experts in the field of epidemiology ($n = 1$), stigma research ($n = 2$), psychiatry ($n = 2$) and clinical psychology ($n = 2$). The experts were asked to review the questionnaire and to evaluate whether the content of the scale is adequate to assess internalized stigma of mental illness among speakers of Malayalam in Kerala. They considered whether any questions should be added or subtracted.

2.3. Factorial validity

2.3.1. Study design and data collection

To examine the factorial validity of the Malayalam-language ISMI, a cross-sectional survey was conducted among 290 patients attending follow-up outpatient community-based or psychiatric hospital-based mental health clinics in Kerala, India. The study samples were collected from 13 randomly selected government health care centers where the District Mental Health Programme (DMHP) has integrated mental health into primary care and in follow-up outpatient clinics of a government Mental Health Centre (government psychiatric hospital) in the Trivandrum district of Kerala. The selected DMHP clinics include district hospitals ($n = 1$), *taluk* (administrative unit below district) headquarter hospitals ($n = 1$), regional health centers ($n = 1$), community health centers ($n = 5$), and primary health centers ($n = 5$). Only patients aged 18 years or above with a clinical diagnosis of mental illness who have had a mental illness for six months or more and who have resided in Trivandrum for more than six months were included in the study. Patients with hearing or speaking impairment were excluded.

The survey instrument comprised the translated Malayalam-language ISMI, information on socio-demographic characteristics and illness-related factors. The study was approved by the Institutional Ethical Committee of the Sree Chitra Tirunal Institute for Medical Sciences and Technology, as well as by the DMHP and MHC, Trivandrum, India. It was funded by means of own resources.

2.3.2. Statistical analysis

Arithmetic means and proportions were used for purposes of sample description. The descriptive analyses were conducted using R version 3.0.2 (The R Foundation for Statistical Computing, 2013).

Given the categorical nature of the ISMI items, means and variance adjusted weighted least squares (WLSMV) confirmatory factor analysis was conducted to examine the factor structure of the Malayalam ISMI (Byrne, 2012). Following established guidelines (Brown, 2006), the analysis of the factor structure of the ISMI began with the examination of the first-order model consisting of 29 items and the five factors "alienation" (items 1, 5, 8, 16, 17, 21), "stereotype endorsement" (items 2, 6, 10, 18, 19, 23, 29), "discrimination experience" (items 3, 15, 22, 25, 28), "social

നിങ്ങൾ ഈ ചോദ്യാവലിയിൽ 'മാനസികരോഗം' എന്ന പദമാണ് ഉപയോഗിക്കാൻ പോകുന്നത്. പക്ഷേ, നിങ്ങൾക്ക് ഏറ്റവും അനുയോജ്യമായി തോന്നുന്ന പദപ്രയോഗമായി ഇതിനെ കരുതുക.

ഓരോ ചോദ്യത്തിനും ദയവായി നിങ്ങൾ 'പൂർണ്ണമായും വിസമ്മതിക്കുന്നു', 'വിസമ്മതിക്കുന്നു', 'സമ്മതി ക്കുന്നു' അല്ലെങ്കിൽ 'പൂർണ്ണമായും സമ്മതിക്കുന്നു' എന്നു മാർക്ക് ചെയ്യുക.

1	എനിക്കു മാനസികരോഗം ഉള്ളതു കൊണ്ട് ഞാൻ ലോകത്തിൽ ജീവി ക്കാൻ അനുയോജ്യനല്ല എന്ന് തോ ന്നുന്നു.
2	മാനസികരോഗികൾ അക്രമാസ ക്തരാകാൻ സാധ്യതയുണ്ട്
3	മാനസികരോഗമുള്ളതിനാൽ ആളുക ൾ എന്നോട് വിവേചനം കാട്ടാറുണ്ട്
4	മാനസികരോഗമില്ലാത്തവർ എന്നെ ഒറ്റപ്പെടുത്താതിരിക്കാൻ ഞാൻ അത്ത രത്തിലുള്ള ആളുകളുമായി അടു ത്തിടപെടുന്നത് ഒഴിവാക്കുന്നു.
5	ഞാൻ മാനസികരോഗിയായതിന്റെ പേരിൽ എനിക്ക് ചമ്മലും നാണക്കേ ടുമുണ്ട്?
6	മാനസികരോഗമുള്ളവർ കല്യാണം കഴിക്കാൻ പാടില്ല.
7	മാനസിക രോഗമുള്ളവർ സുപ്ര ധാനമായ സംഭാവനകൾ സമൂഹ ത്തിന് നല്കാറുണ്ട്
8	മാനസികരേഗമില്ലാത്തവരെ അപേക്ഷി ച്ചുനോക്കുമ്പോൾ എനിക്ക് അപകർ ഷത തോന്നാറുണ്ട്
9	മാനസികരോഗം മൂലം എന്റെ രൂപവും പെരുമാറ്റവും വിചിത്രമാകാം എന്നതുകൊണ്ട് ഞാൻ പഴയതു പോലെ സാമൂഹിക ഇടപെടലുകൾ നടത്താറില്ല
10	മാനസികരോഗികൾക്ക് ഉത്തമവും, സംതൃപ്തവുമായ ജീവിതം നയിക്കാ ൻ കഴിയില്ല
11	എന്റെ മാനസികരോഗം മൂലം മറ്റുള്ളവർക്ക് ബുദ്ധിമുട്ടുണ്ടാകുമെ ന്നുള്ളതുകൊണ്ട് ഞാൻ എന്നെ പ്പറ്റിഅധികം സംസാരിക്കാറില്ല
12	മാനസികരോഗത്തെപ്പറ്റിയുള്ള നിഷേ ധാത്മകമായസങ്കല്പങ്ങൾ സാധാരണ ലോകത്തിൽ നിന്നും എന്നെ ഒറ്റപ്പെടു ത്തുന്നു
13	മാനസികരോഗമില്ലാത്തവർക്ക് ഒപ്പമാ യിരിക്കുക എന്നത് എന്നെ അനു യോജ്യനല്ലാത്തവനും അപര്യാപ്ത നും ആകുന്നു.
14	മാനസികരോഗമുള്ളയാളുമൊത്ത് പൊതുസ്ഥലത്ത് ആയിരിക്കുന്നത് സൗകര്യപ്രദമായി ഞാൻ കരുതുന്നു
15	എനിക്ക് മാനസികരോഗം ഉള്ളതു കൊണ്ട് മാത്രം ആളുകൾ എന്നെ ഗൗരവമില്ലാതെ കാണുകയും കുട്ടിയെപോലെ പരിചരിക്കുകയും ചെയ്യുന്നു
16	മാനസികരോഗമുള്ളതിനാൽ ഞാൻ എന്നിൽത്തന്നെ നിരാശനാണ്
17	മാനസികരോഗം എന്റെ ജീവിതത്തെ നശിപ്പിച്ചു
18	എന്നെ കാണുമ്പോൾതന്നെ മാന സിക രോഗമുള്ളതായി ആളുകൾക്ക് പറയാൻ കഴിയും
19	എനിക്ക് മാനസികരോഗമുള്ളതിനാൽ എന്നെ സംബന്ധിച്ചുള്ള മിക്ക തീരുമാ നങ്ങളുമെടുക്കാൻ മറ്റുള്ളവരുടെ സഹായം എനിക്ക് ആവശ്യമാണ്
20	എന്റെ കുടുംബത്തിനെയും, സുഹൃ ത്തുക്കളെയും നാണക്കേടിൽ നിന്നും രക്ഷിക്കാൻ സാമൂഹിക ചുറ്റുപാടു കളിൽനിന്നും ഞാൻ മാറിനിൽക്കും
21	മാനസികരോഗമില്ലാത്തവർക്ക് എന്നെ മനസ്സിലാക്കാൻ സാധ്യമാണെന്നു വരില്ല.
22	എനിക്ക് മാനസികരോഗമുള്ളതിനാൽ ആളുകൾ എന്നെ നിസാരമായികാണു കയും അവഗണിക്കുകയും ചെയ്യുന്നു
23	എനിക്ക് മാനസികരോഗമുള്ളതി നാൽ സമൂഹത്തിനു ഒരു നേട്ട ങ്ങളും നൽകാൻ കഴിയില്ല
24	മാനസികരോഗത്തോടെ ജീവിക്കുന്ന ത്, എന്നെ ജീവിതത്തെ കഠിനമായി അതിജീവിച്ച ആളാക്കുന്നു.
25	എനിക്ക് മാനസികരോഗമുള്ളതിനാൽ എന്നോടടുക്കാൻ ആരും താത്പര്യം കാണിക്കുന്നില്ല
26	പൊതുവായി ഞാൻ ആഗ്രഹിക്കുന്ന പോലെ ജീവിക്കാൻ എനിക്കു കഴിയുന്നു.
27	ഞാനൊരു മാനസികരോഗിയായിരു ന്നാലും എനിക്ക് നല്ലതും സംതൃപ്ത വുമായ ജീവിതം നയിക്കാൻ കഴിയും
28	എനിക്ക് മാനസികരോഗമായതിനാൽ കൂടുതലൊന്നും നേടാൻ എനിക്കു കഴിയില്ലെന്നു മറ്റുള്ളവർ ചിന്തിക്കുന്നു
29	മാനസികരോഗത്തെ സംബന്ധിച്ച സ്ഥായിയായ സങ്കല്പങ്ങൾ എനിക്ക് ബാധകമാണ്

Response categories:

1.പൂർണ്ണമായുംവിസമ്മതിക്കു ന്നു.
2. വിസമ്മതിക്കുന്നു
3. സമ്മതിക്കുന്നു
4. പൂർണ്ണമായും സമ്മതിക്കുന്നു.

Fig. 1. Malayalam version of the Internalized Stigma of Mental Illness Inventory (ISMI).

withdrawal" (4, 9, 11, 12, 13, 20) and "stigma resistance" (items 7, 14, 24, 26, 27). Since the items of the stigma resistance scale are negatively worded, they were reverse-coded prior to analysis.

After the establishment of a well-fitting first-order CFA solution, the fit of a second-order solution was tested in which the first-order factor loaded on one second-order factor of "internalized stigma".

The fit of the measurement model was evaluated by means of different indices. As indices of absolute model fit the robust goodness-of-fit chi-square (χ^2) and the Weighted Root Mean Square Residual (WRMR) were calculated. In addition, the Tucker-Lewis index (TLI), the comparative fit index (CFI) and the root mean square error of approximation (RMSEA) were used. Following common guidelines (Kline, 2005; Brown, 2006), a WRMR <0.90, a TLI and CFI >0.95 and a RMSEA <0.05 were considered to indicate a good model fit. A TLI and CFI between 0.90 and 0.95 and an RMSEA between 0.05 and 0.08 were considered to indicate a reasonable fit. Items with completely standardized factor loadings (λ) <0.40 were considered to indicate sources of strain and were deleted from the factor solution. In addition, modification indices and expected parameter changes were reviewed to identify areas of misfit. Suggested modifications that were considered theoretically sound were implemented (Kline, 2005; Brown, 2006; Muthén, 2004).

To adjust for the clustering design of the study, dummy variables for the 13 sites were included as covariates into all CFA models. The CFA analyses were conducted using Mplus version 5.1 (Muthén and Muthén, 2007).

Cronbach's alpha coefficients were calculated as measure of internal consistency. Despite being limited in several respects (Sijtsma, 2009), they were used to facilitate comparison with existing studies in the field.

3. Results

3.1. Content validity

The experts interviewed on the content validity confirmed that the items of the translated questionnaire adequately represent internalized stigma in the Malayalam-speaking population of Kerala. Thus, the experts concluded that there were no important missing aspects of internalized stigma among Malayalam speakers, and that there were no questions that appeared not to be applicable for this population. Thus, they did not recommend adding or subtracting any items.

3.2. Factorial validity

3.2.1. Sample description

In total, data from 290 respondents was available for analysis. Table 1 shows the socio-demographic characteristics of the sample. It consisted of a similar proportion of males and females with the overall mean age being 44.9 years. The majority of participants in the sample (92.1%) were residing in rural areas. In terms of socio-economic status, about 10% of the sample population were graduates and/or skilled workers including professionals. These demographics resemble those of the total population of Kerala (Government of India, 2011). The majority of patients suffered from bipolar affective disorders (38.3%) and schizophrenia (27.4%). Other conditions were dementia, anxiety disorders and depressive disorders, psychosis and epilepsy. The average duration of illness was 16.2 years.

Table 2 shows the responses to the items of the Internalized Stigma of Mental Illness (ISMI) scale by category. The proportions of respondents who agreed or strongly agreed with the items of the ISMI factors ranged from 36% to 62% for the alienation factor, 20% to 53% for the stereotype endorsement factor, 32% to 52% for the discrimination experience factor and 31% to 51% for the social withdrawal factor. The proportion of respondents who agreed or strongly agreed was also high for the items of the stigma resistance scale, ranging from 58% to 87%. For the calculation of mean scores the items of the stigma resistance scale were inversely coded in line with other studies in the field.

The scale mean scores ranged from 1.9 for the domain of reversely coded stigma resistance scale to 2.4 for the domain of social withdrawal. The range of proportions of respondents with mean score >2.5 was between 17.9% for the stigma resistance and 44.8 for the alienation domain (Table 3). Internal consistencies for the five factors consisting of 29 items were Cronbach's $\alpha = 0.78$ for alienation, $\alpha = 0.73$ for stereotype endorsement, $\alpha = 0.84$ for

Table 1
Socio-demographic and disease characteristics of the study sample.

Age (years) (mean ± SD)	44.9	11.7
Sex (*n*, %)		
Male	143	49.3
Female	147	50.7
Place of residence (*n*, %)		
Urban	23	7.9
Rural	267	92.1
Education (*n*, %)		
No schooling	9	3.1
Primary school (class 4)	51	17.6
Upper primary school (class 7)	60	20.7
High school (class 10)	145	50.0
Graduation	22	7.6
Post-graduation and above	3	1.0
Occupation (*n*, %)		
Non-employed	57	19.7
Skilled	31	10.7
Unskilled	117	40.3
Retired	2	0.7
Student	3	1.0
Housewife/homemaker	80	27.6
Monthly household expenditure (*n*, %)		
<3100 Indian Rupees	145	50.0
≥3100 Indian Rupees	145	50.0
Marital status (*n*, %)		
Single	81	27.9
Currently married	143	49.3
Widowed	27	9.3
Divorced/Separated	39	13.4
Family type[a] (*n*, %)		
Nuclear	39	13.4
Joint	251	86.6
Religion (*n*, %)		
Hindu	200	69.0
Christian	64	22.1
Others	26	9.0
Caste[b] (*n*, %)		
Backward	131	45.2
Forward	159	54.8
Diagnosis (*n*, %)		
Bipolar affective disorders	111	38.3
Schizophrenia	79	27.2
Dementia and anxiety disorders	44	15.2
Psychosis	24	8.3
Depressive disorders	16	5.5
Epilepsy	12	4.1
Alcohol dependent syndrome	4	1.4

[a] Nuclear family is a family structure where first degree relatives live under a single roof; whereas in joint families, first, second and/or third relatives live under a single roof.
[b] Backward caste: castes which are educationally and socially disadvantaged; Forward caste: the social group that has the highest status in society, especially the aristocracy.

Table 2
Responses to the items of the Malayalam language Internalized Stigma of Mental Illness Inventory (ISMI) by category (%,$n = 290$).

Sub-scale/items	Response (%)			
	Strongly disagree	Disagree	Agree	Strongly agree
Alienation				
1.I feel out of place in the world because I have a mental illness	55.9	6.9	11.7	25.5
5. I am embarrassed or ashamed that I have a mental illness	43.1	8.6	12.4	35.9
8. I feel inferior to others who don't have a mental illness	44.5	6.6	13.8	35.2
16. I am disappointed in myself for having a mental illness	27.9	10.0	10.3	51.7
17. Having a mental illness has spoiled my life	36.9	11.0	14.1	37.9
21. People without mental illness could not possibly understand me	52.4	12.4	15.5	19.7
Stereotype endorsement				
2. Mentally ill people tend to be violent	32.8	14.5	16.6	36.2
6. Mentally ill people shouldn't get married	57.9	22.4	7.6	12.1
10. People with mental illness cannot live a good, rewarding life	54.1	14.5	10.0	21.4
18. People can tell that I have a mental illness by the way I look	46.9	10.0	16.9	26.2
19. Because I have a mental illness, I need others to make most decisions for me	47.2	4.1	7.9	40.7
23. I can't contribute anything to society because I have a mental illness	48.6	8.6	12.4	30.3
29. Stereotypes about the mentally ill apply to me	43.4	11.7	17.9	26.9
Discrimination experience				
3. People discriminate against me because I have a mental illness	39.3	8.3	13.1	39.3
15. People often patronize me, or treat me like a child, just because I have a mental illness	49.0	8.3	9.7	33.1
22. People ignore me or take me less seriously just because I have a mental illness	49.7	7.2	12.8	30.3
25. Nobody would be interested in getting close to me because I have a mental illness	60.3	8.3	9.7	21.7
28. Others think that I can't achieve much in life because I have a mental illness	37.9	12.1	15.5	34.5
Social withdrawal				
4. I avoid getting close to people who don't have a mental illness to avoid rejection	36.6	11.7	12.8	39.0
9. I don't socialize as much as I used to because my mental illness might make me look or behave "weird"	38.3	10.7	15.2	35.9
11. I don't talk about myself much because I don't want to burden others with my mental illness	35.9	4.8	16.2	43.1
12. Negative stereotypes about mental illness keep me isolated from the "normal" world	42.4	13.1	12.4	32.1
13. Being around people who don't have a mental illness makes me feel out of place or inadequate	47.9	11.0	16.2	24.8
20. I stay away from social situations in order to protect my family or friends from embarrassment	57.2	10.0	13.1	19.7
Stigma resistance				
7. People with mental illness make important contributions to society	15.2	7.6	13.8	63.4
14. I feel comfortable being seen in public with an obviously mentally ill person	32.8	9.0	10.3	47.9
24. Living with mental illness has made me a tough survivor	26.2	7.2	17.9	48.6
26. In general, I am able to live my life the way I want to	23.4	8.3	25.5	42.8
27. I can have a good, fulfilling life, despite my mental illness	9.0	3.8	15.5	71.7

discrimination experience, $\alpha = 0.82$ for social withdrawal and $\alpha = 0.22$ for stigma resistance. Cronbach's α was 0.91 for all five factors combined and 0.93 for all factors excluding stigma resistance.

Table 3
Mean scores of scales and percentage of respondents with mean scores > 2.5 (based on the original 29-item measurement model).

Scales	Mean; standard deviation	Percentage of respondents with mean scores > 2.5
Sub-scale*		
Alienation	2.4; 0.9	44.8
Stereotype endorsement	2.2; 0.8	34.8
Discrimination experience	2.3; 1.0	41.7
Social withdrawal	2.4; 0.9	43.8
Stigma resistance (reversely coded)	1.9; 0.6	17.9
Full scale		
Full scale consisting of all sub-scales	2.2; 0.6	48.6
Full scale consisting of all sub-scales expect stigma resistance	2.3; 0.8	41.4

* Higher scores indicate higher expression of stigma.

3.2.2. Confirmatory factor analysis

The theorized factor structure of the ISMI consisting of 29 items and 5 factors had a suboptimal model fit as indicated by different fit indices (Model 1: $\chi^2 = 280.326$ [df = 139, $p < 0.001$]; WRMR = 0.940; TLI = 0.971, CFI = 0.948; RMSEA = 0.059). In addition, item 24 of the stigma resistance scale showed a high negative factor loading ($\lambda = -0.861$), while the items 7 and 14 of the scale showed low positive loadings (item 7: $\lambda = 0.376$; item 14: $\lambda = 0.266$). Considering the fact that only two items of the scale showed satisfactory loadings, the stigma resistance scale was removed from the measurement model and the factor structure was reparameterized accordingly. The modified measurement model, consisting of 24 items and 4 factors showed a reasonable to good model fit, as indicated by all model fit indices (Model 2: $\chi^2 = 225.245$ [df = 122, $p < 0.001$]; WRMR = 0.868; TLI = 0.979, CFI = 0.960; RMSEA = 0.054). Modification indices and expected parameter changes indicated that the items 16 and 21 of the alienation factor cross-loaded on several of the other dimensions. Further inspection of the factor loadings showed that item 6 only loaded weakly ($\lambda = 0.365$) on the stereotype endorsement scale. Despite the acceptable fit of model 2, we therefore decided to implement the three modifications and rerun the CFA on the remaining 21 items. The reduced model, consisting of 21 items and 4 factors resulted in a good model fit (model 3: $\chi^2 = 194.882$ [df = 111, $p < 0.001$]; WRMR = 0.817; TLI = 0.981, CFI = 0.966; RMSEA = 0.051) and was considered the final first-order measurement model of the ISMI in the present population of Malayalam speakers. Based on this model, a measurement model with one second-order factor representing internalized stigma was tested.

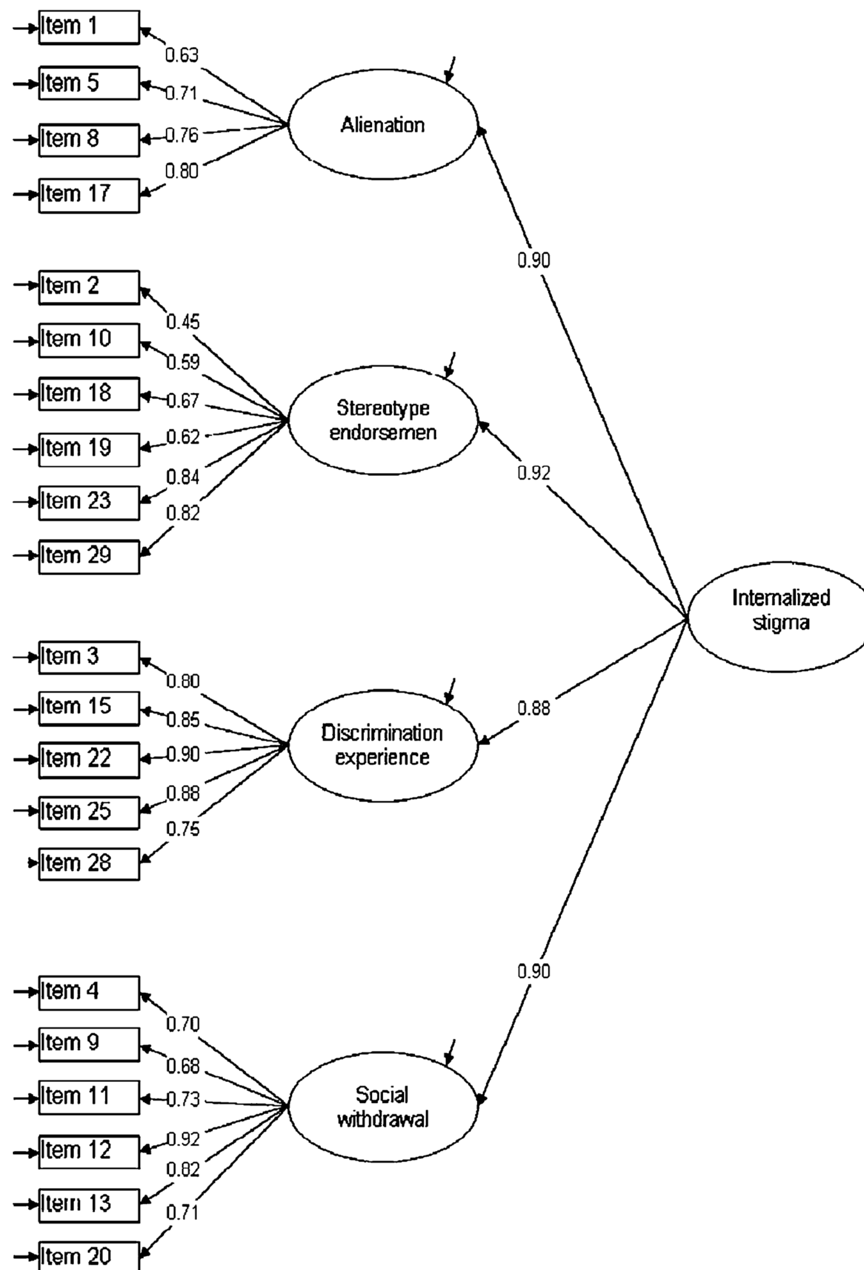

Fig. 2. Factor structure of the modified* measurement model of the Malayalam language Internalized Stigma of Mental Illness Inventory (ISMI) (numbers displayed on the arrows signify completely standardized factor loadings, $n = 290$). (* In the course of the analysis the stigma resistance dimension (items 7, 14, 24, 26 and 2) as well as the items 6, 16 and 21 were removed for reasons outlined in Section 3.)

The second-order model did not show a significant degradation in model fit as compared to the first-order solution (model 4: $\chi^2 = 194.333$ [df = 111, $p < 0.001$]; WRMR = 0.819; TLI = 0.982, CFI = 0.966; RMSEA = 0.051). This becomes evident in unchanged (TLI, CFI, RMSEA) or marginally larger (WRMR) fit indices in the second-order as compared the first-order model and is also reflected in a non-significant χ^2 difference test as conducted by means of the Mplus DIFFTEST option ($\Delta\chi^2 = 2.184$ [df = 2, $p > 0.05$]).

The factor loadings of the second-order model are displayed in Fig. 2. Internal consistencies for the four factors of the modified 21-item measurement model were Cronbach's $\alpha = 0.71$ for alienation, $\alpha = 0.73$ for stereotype endorsement, $\alpha = 0.84$ for discrimination experience and $\alpha = 0.82$ for social withdrawal. Cronbach's α for the second-order factor "internalized stigma" was 0.93.

4. Discussion

The aim of our study was to adapt the Internalized Stigma of Mental Illness (ISMI) scale to the Malayalam-speaking population of Kerala, India and to test its content and factorial validity by means of qualitative expert interviews and confirmatory factor analysis. While the ISMI has been used in different research settings and has been translated into over 50 languages, to the best of our knowledge, our study is one among two to test its factorial structure by means of a hypothesis-testing approach. The other available confirmatory analysis has been conducted on the Chinese version of the ISMI in Taiwan (Chang et al., 2014).

Our study showed that the Malayalam version of the hypothesized original measurement model of the ISMI, consisting of 29 items and 5 factors, has a mediocre fit in the population of Kerala.

Aside from two cross-loading indicators and one indicator with a low factor loading, the stigma resistance factor was identified to be a source of considerable misfit. Similar observations, although mostly on an exploratory basis, were made in other studies, which applied the ISMI in different populations and research contexts and identified the stigma resistance scale to have poorer psychometric properties than the other ISMI scales. This, for example, became evident in low internal consistencies and a low correlation with the other ISMI scales (see the review by Boyd et al., 2014 for an overview). Comparably poor psychometric properties of the stigma resistance scale were also observed in the original validation study of the ISMI (Ritsher et al., 2003). The reason for this likely is that the stigma resistance scale is conceptually different from the other scales of the instrument. In addition, the reverse coding of items of the stigma resistance scale presumably makes it difficult for respondents to switch response sets, thus contributing to the poor performance of the scale.

Unlike the Chinese version of the ISMI, we also found sources of poor model fit in a few other items. Item 6 (‘‘Mentally ill people shouldn't get married'') which was hypothesized to load on the stereotype endorsement dimension showed a low factor loading in our sample. A low loading of this item was also observed in the original validation study. In the present study, modification indices indicated that the items 16 (‘‘I am disappointed in myself for having a mental illness'') and 21 (‘‘People without mental illness could not possibly understand me'') cross-loaded on other dimensions. Similar findings were obtained in the original validation study where item 16 cross-loaded on the social withdrawal and item 21 cross-loaded on the stereotype endorsement, discrimination experience and social withdrawal dimension. Cross-loadings of item 21 partially exceeded the primary loadings in size (Ritsher et al., 2003). A cross-loading of item 21 on the perceived discrimination dimension was also reported in the Amharic validation study (Assefa et al., 2012).

There are certain reasons that these items might be less applicable to the construct of internalized stigma in a cultural setting like that of India where family plays a major role in the care of mentally ill patients and where religion and other existing belief system contribute less to bearing self-blame for a person's illness (Stansfeld and Sproston, 2002). Studies have shown that social and family support may decrease internalized stigma (Verhaeghe et al., 2008; Yanos et al., 2008). Additionally, religion and family act as a protective factor by giving hope and support when a family member is suffering from illness (Davis and Brekke, 2014). This can be the reason why many of the persons with mental disorders do not feel that they are disappointed with themselves even while having mental illness. Furthermore, Kerala is a state with a comparably high literacy rate (Government of India, 2011). Psychiatric hospitals and clinics are very common and social media plays a major role in creating awareness about mental disorders in the state (World Health Organisation and World Organization of Family Doctors, 2008). This can be one of the reasons why participants felt that others could understand them.

The items 6, 16 and 21 as well as the items of the stigma resistance scale should be thoroughly scrutinized in further applications of the instrument and considered for deletion in case they show to be similarly problematic as in the present case. Considering our data, we regard analyses based on the reduced measurement models to be superior with respect to validity and reliability over analysis based on the full measurement model. Researchers must be aware, however, that any changes to the measurement model limit the comparability to existing and future studies which are based on the original model.

One aspect to consider in our investigation is that the proportion of individuals reporting high stigma was higher than in other evaluation studies of the ISMI (Boyd et al., 2014). Still, the properties of the questionnaire should be considered independent of the level of stigma of the study population.

The internal consistencies of the reduced measurement model resembled those from some other versions of the ISMI which removed the stigma resistance scale because of low reliability (Boyd et al., 2014).

Our study has some limitations. The study is facility-based; therefore the findings cannot be generalized to people in the community who remain undiagnosed or untreated. The changes we applied to the original measurement model of the ISMI as guided by indices of model fit and other criteria have to be considered an exploratory approach (Brown, 2006). Future validations of the questionnaire both in Malayalam as well as in other languages would be needed in order to confirm these changes as valid modifications to the measurement model.

Given the role of internalized stigma as one of the main factors for delays in seeking appropriate treatment among people with mental disease conditions, the availability of a valid instrument for the study of this construct is of high relevance for research and clinical practice. Our study shows that despite some necessary modifications the translated and adapted Malayalam ISMI can be considered a valid instrument in terms of its factor structure and content. This makes the ISMI applicable to a large population in India where little is known about the prevalence and determinants of internalized stigma.

Future investigations should further examine the possible sources of a reduced model fit that we identified and that are also suggested by other studies which applied the ISMI in different population groups (e.g., with respect to deleting the stigma resistance subscale). The properties of the questionnaire may reflect the disease profile in the underlying sample. Similar to other studies in the field, our sample comprised individuals with different disorders. Future studies should therefore also examine whether the factor structure of the ISMI is dependent on the clinical conditions of the respondents and whether this can explain the poor performance of some items identified in the present and previous studies. Finally, other aspects of validity, such as convergent and divergent validity, need to be explored for the Malayalam version. It would be particularly important to examine whether the external validity of the reduced scale is superior to that of the full version.

Appendix A

Original (English) version of the Internalized Stigma of Mental Illness inventory (ISMI) (Ritsher et al., 2003)

We are going to use the term ‘‘mental illness'' in the rest of this questionnaire, but please think of it as whatever you feel is the best term for it.

For each question, please mark whether you strongly disagree, disagree, agree, or strongly agree.

1	I feel out of place in the world because I have a mental illness
2	Mentally ill people tend to be violent
3	People discriminate against me because I have a mental illness
4	I avoid getting close to people who don't have a mental illness to avoid rejection
5	I am embarrassed or ashamed that I have a mental illness
6	Mentally ill people shouldn't get married
7	People with mental illness make important contributions to society
8	I feel inferior to others who don't have a mental illness
9	I don't socialize as much as I used to because my mental illness might make me look or behave ‘‘weird''
10	People with mental illness cannot live a good, rewarding life
11	I don't talk about myself much because I don't want to burden others with my mental illness

12	Negative stereotypes about mental illness keep me isolated from the "normal" world
13	Being around people who don't have a mental illness makes me feel out of place or inadequate
14	I feel comfortable being seen in public with an obviously mentally ill person
15	People often patronize me, or treat me like a child, just because I have a mental illness
16	I am disappointed in myself for having a mental illness
17	Having a mental illness has spoiled my life
18	People can tell that I have a mental illness by the way I look
19	Because I have a mental illness, I need others to make most decisions for me
20	I stay away from social situations in order to protect my family or friends from embarrassment
21	People without mental illness could not possibly understand me
22	People ignore me or take me less seriously just because I have a mental illness
23	I can't contribute anything to society because I have a mental illness
24	Living with mental illness has made me a tough survivor
25	Nobody would be interested in getting close to me because I have a mental illness
26	In general, I am able to live my life the way I want to
27	I can have a good, fulfilling life, despite my mental illness
28	Others think that I can't achieve much in life because I have a mental illness
29	Stereotypes about the mentally ill apply to me

Response categories:

1. *Strongly disagree*
2. *Disagree*
3. *Agree*
4. *Strongly agree*

References

Assefa, D., Shibre, T., Asher, L., Fekadu, A., 2012. Internalized stigma among patients with schizophrenia in Ethiopia: a cross-sectional facility-based study. BMC Psychiatry 12, 239.

Bary, A.A., 2008. Common mental, neurological and substance use disorders. Kerala State Health Authority Newslett. 1, 5–8.

Beaton, D.E., Bombardier, C., Guillemin, F., Ferraz, M.B., 2000. Guidelines for the process of cross-cultural adaptation of self-report measures. Spine 25, 3186–3191.

Boyd, J.E., Adler, E.P., Otilingam, P.G., Peters, T., 2014. Internalized Stigma of Mental Illness (ISMI) Scale: a multinational review. Compr. Psychiatry 55, 221–231.

Boyd, J.E., Katz, E.P., Link, B.G., Phelan, J.C., 2010. The relationship of multiple aspects of stigma and personal contact with someone hospitalized for mental illness, in a nationally representative sample. Soc. Psychiatry Psychiatr. Epidemiol. 45, 1063–1070.

Brohan, E., Slade, M., Clement, S., Thornicroft, G., 2010. Experiences of mental illness stigma, prejudice and discrimination: a review of measures. BMC Health Serv. Res. 10, 80.

Brown, T., 2006. Confirmatory Factor Analysis for Applied Research. Guilford, New York.

Byrne, B.M., 2012. Structural Equation Modeling with Mplus, Basic Concepts, Applications, and Programming. Routledge, New York, NY.

Chang, C.-C., Wu, T.-H., Chen, C.-Y., Wang, J.-D., Lin, C.-Y., 2014. Psychometric evaluation of the Internalized Stigma of Mental Illness Scale for patients with mental illnesses: measurement Invariance across time. PLoS ONE 9, e98767.

Corrigan, P.W., Watson, A.C., 2002. Understanding the impact of stigma on people with mental illness. World Psychiatry 1, 16–20.

Corrigan, P.W., Watson, A.C., Barr, L., 2006. The self-stigma of mental illness: implications for self-esteem and self-efficacy. J. Soc. Clin. Psychol. 25, 875–884.

Corrigan, P.W., Sokol, K.A., Rüsch, N., 2013. The impact of self-stigma and mutual help programs on the quality of life of people with serious mental illnesses. Community Ment. Health J. 49, 1–6.

Davis, L., Brekke, J., 2014. Social support and functional outcome in severe mental illness: the mediating role of proactive coping. Psychiatry Res. 215, 39–45.

Government of India, 2011. Provisional population totals. Paper 2, volume 1 of 2011. In: Rural-urban DistributionGovernment of India.

Kline, R.B., 2005. Principles and Practice of Structural Equation Modeling. Guilford Press, New York, NY.

Link, B.G., Struening, E.L., Rahav, M., Phelan, J.C., Nuttbrock, L., 1997. On stigma and its consequences: evidence from a longitudinal study of men with dual diagnoses of mental illness and substance abuse. J. Health Soc. Behav. 38, 177–190.

Livingston, J.D., Boyd, J.E., 2010. Correlates and consequences of internalized stigma for people living with mental illness: a systematic review and meta-analysis. Soc. Sci. Med. 71, 2150–2161.

Loganathan, S., Murthy, S.R., 2008. Experiences of stigma and discrimination endured by people suffering from schizophrenia. Indian J. Psychiatry 50, 39–46.

Muthén, B.O., 2004. Mplus. Statistical analysis with latent variables. In: Technical AppendicesMuthén & Muthén, Los Angeles.

Muthén, L.K., Muthén, B.O., 2007. Mplus User's Guide, fifth ed. Muthén & Muthén, Los Angeles.

Ritsher, J.B., Otilingam, P.G., Grajles, M., 2003. Internalized stigma of mental illness: psychometric properties of a new measure. Psychiatry Res. 121, 31–49.

Sijtsma, K., 2009. On the use, the misuse, and the very limited usefulness of Cronbach's alpha. Psychometrika 74, 107–120.

Stansfeld, S., Sproston, K., 2002. Social support and networks. In: Sproston, K., Nazroo, J. (Eds.), Ethnic Minority Psychiatric Illness Rates in the Community (EMPIRIC). TSO, London.

Thankappan, K.R., Shah, B., Mathur, P., Sarma, P.S., Srinivas, G., Mini, G.K., Daivadanam, M., Soman, B., Vasan, R.S., 2010. Risk factor profile for chronic non-communicable diseases: results of a community-based study in Kerala, India. Indian J. Med. Res. 131, 63.

Thara, R., Srinivasan, T.N., 2000. How stigmatising is schizophrenia in India? Int. J. Soc. Psychiatry 46, 135–141.

The R Foundation for Statistical Computing, 2013. R version 3.0.2. R Foundation for Statistical Computing, Vienna ⟨http://www.r-project.org/⟩ [Online]

Verhaeghe, M., Bracke, P., Bruynooghe, K., 2008. Stigmatization and self-esteem of persons in recovery from mental illness: the role of peer support. Int. J. Soc. Psychiatry 54, 206–218.

Watson, A.C., Corrigan, P.W., Larson, J.E., Sells, M., 2007. Self-stigma in people with mental illness. Schizophr. Bull. 33, 1312–1318.

World Health Organisation, World Organization of Family Doctors, 2008. Integrating Mental Health into Primary Care. A Global Perspective. World Health Organization, Geneva.

Yanos, P.T., Roe, D., Markus, K., Lysaker, P.H., 2008. Pathways between internalized stigma and outcomes related to recovery in schizophrenia spectrum disorders. Psychiatr. Serv. 59, 1437–1442.