

Three Scales of Mental Health-Related Stigma: Additional Evidence on its Psychometric Properties in the Portuguese Population

Três Escalas sobre Estigma na Saúde Mental: Evidência Adicional das Propriedades Psicométricas para a População Portuguesa

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ABSTRACT

Introduction: The aim of this study was to provide additional evidence on the psychometric properties in the Portuguese population of three stigma scales: Mental Health Knowledge Schedule (MAKS), Scaling Community Attitudes Toward the Mentally Ill 12 (CAMI-12), and Reported and Intended Behaviour Scale (RIBS).

Methods: A total of 3556 participants were recruited and completed the three scales online. The study includes confirmatory factor analysis, internal consistency analysis, test-retest reliability, convergent validity, and known-groups validity tests.

Results: The results suggest that the European Portuguese RIBS version appears to be a valid measure of stigma in the Portuguese population, as well as the CAMI-12 "Prejudice and Exclusion" subscale and a modified version of MAKS. The results corroborate the existing evidence of a positive correlation between mental health-related stigma and low educational status, as well as reduced contact with someone with mental illness.

Conclusion: The findings of this study contribute with additional evidence on the validity and reliability of the proposed European Portuguese versions of these three scales.

Keywords: Health Knowledge, Attitudes, Practices; Mental Disorders; Mental Health; Social Stigma; Validation Study

RESUMO

Introdução: Este estudo visou fornecer evidências adicionais sobre as propriedades psicométricas na população portuguesa de três escalas de estigma: *Mental Health Knowledge Schedule* (MAKS), *Scaling Community Attitudes Toward the Mentally Ill 12* (CAMI-12) e *Reported and Intended Behaviour Scale* (RIBS).

Métodos: Um total de 3556 participantes foram recrutados e completaram as três escalas online. O estudo inclui análise fatorial confirmatória, análise da consistência interna, teste-reteste, validade convergente e validade de grupos-conhecidos.

Resultados: Os resultados sugerem que a versão portuguesa do RIBS parece ser um instrumento válido de avaliação do estigma na população portuguesa, assim como a subescala "Preconceito e Exclusão" da CAMI-12 e uma versão modificada do MAKS. Os resultados corroboram as evidências existentes de uma correlação positiva entre estigma relacionado à saúde mental e baixo nível educacional, assim como contato reduzido com alguém com doença mental.

Conclusão: Os resultados deste estudo contribuem com evidência adicional das propriedades psicométricas das versões propostas destas três escalas.

Palavras-chave: Conhecimento, Atitudes e Práticas na Saúde; Estigma Social; Perturbações Mentais; Saúde Mental; Estudo de Validação

KEY MESSAGES

- Stigma is a complex phenomenon with a significant impact on people's lives and a relevant barrier to seeking mental health support.
- It is essential to have validated and culturally competent instruments to evaluate stigma in context.
- Mental Health Knowledge Schedule (MAKS), Scaling Community Attitudes Toward the Mentally Ill 12 (CAMI-12), and Reported and Intended Behaviour Scale (RIBS) are three scales that allow for a comprehensive evaluation of three different dimensions of stigma: knowledge, attitudes, and behavior.
- This study suggests that the European Portuguese version of RIBS appears to be a valid measure of stigma in the Portuguese population, as does the CAMI-12 "Prejudice and Exclusion" subscale, along with a modified version of MAKS.

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INTRODUCTION

Stigma is a complex and heterogeneous concept. It can be defined as a process that occurs when a feature – a ‘mark’ – is considered undesirable and deeply discrediting, based on negative stereotypes and prejudices, leading to inequality of opportunities and discrimination against people or groups.^{1,2}

Mental health-related stigma and discrimination are a worldwide concern, with different expressions across cultures. Stigma operates at various levels: individually, within families, across healthcare systems and providers, and in society in general. Cultural beliefs, etiological attributions of mental illness and social perceptions will shape the manifestation of mental health-related stigma and its implications. In African cultures, mental illness is frequently attributed to supernatural causes, mostly viewed as malignant, blocking appropriate treatment-seeking behavior. In South American cultures, mental illness is often conceptualized as personal weakness or lack of willpower, contributing to erroneous social perceptions of mental illness. In western cultures, although mental illness is currently well established as a health issue, it is frequently associated with unpredictability and dangerousness, dictating lack of understanding and empathy from others, and leading to social exclusion.³

People with mental illness often experience reduced wellbeing and life opportunities, evidenced by how stigma is associated with impaired access to mental health services and physical health care, premature mortality, victimization, harassment, social exclusion and discrimination in settings including education, employment, and housing.¹ One fundamental consequence relates to the person's effort not to be labeled as mentally ill, thus avoiding and delaying access to essential care.⁴ Many people describe the consequences of stigma and discrimination as worse than the experience of the mental illness itself and stigma is increasingly recognized as a significant public health concern.^{5,6}

The causes of mental health-related stigma are various and intricate, where the lack of understanding and fear most certainly play a role. There are some factors that are known to correlate with higher levels of stigma, such as a low education level and reduced contact with people with mental illness.⁷ Interventions that promote direct and positive interaction with people with mental illness have shown robust evidence of beneficial impact in the mitigation of stigma, probably mediated by familiarity.⁸ In fact, contact and educational interventions are considered the best practices in the field of anti-stigma programs.⁹

Assessing stigma towards people with mental illness allows the monitoring of public stigma as well as the evaluation of interventions. Different scales and instruments have been developed for measuring stigma and its various dimensions.¹⁰ Thornicroft *et al* (2007) point out three fun-

damental domains of stigma: I) the problem of knowledge (literacy); II) the problem of attitude (prejudice); and III) the problem of behavior (discrimination).¹¹ Three instruments were developed specifically to assess each one of these domains of stigma: Mental Health Knowledge Schedule (MAKS)¹²; Scaling Community Attitudes Toward the Mentally Ill (CAMI)¹³; and Reported and Intended Behaviour Scale (RIBS).¹⁴ These scales have been used to monitor public stigma^{15,16} as well as to assess the impact of anti-stigma programs worldwide.^{17,18} The CAMI scale is considered the gold standard measure for assessing stigma towards people with mental disorders.¹⁹ These instruments have been translated into several languages: Spanish,²⁰ French,²¹ Italian,²² Hungarian,²³ Brazilian Portuguese,^{24,25} and European Portuguese.²⁶⁻²⁸

Although studies concerning equivalent versions of these instruments in the Portuguese population exist, none have simultaneously used all three instruments, which we believe reflect more accurately Thornicroft's three-dimensional concept of stigma (knowledge, attitudes, and behavior). This study aimed to provide additional evidence on the psychometric properties of these three instruments in the Portuguese population.

METHODS

Selection of participants

We recruited a convenience sample of Portuguese people over 18 years of age. The study was advertised through the social media accounts of the Lisbon based non-governmental organization “Manifestamente” as part of an anti-stigma campaign. A total of 3556 participants filled in the online questionnaires between October 2020 and October 2021.

The study protocol was approved by the Ethics Committee of the Administração Regional de Saúde de Lisboa e Vale do Tejo (Proc. 047/CES/INV/2020). All data was collected electronically through online questionnaires. The results were pseudonymized: each participant was randomly assigned a numerical code, and their email was hidden from the research team.

Measures

Sociodemographic questionnaire

Background information from participants was collected using a general questionnaire, which included gender (female, male, other), age, marital status (single, married/cohabitant, divorced, widowed, other), education level (primary school, middle school, secondary school, bachelor, master and doctorate), professional situation (student, employed, unemployed, retired), professional field (health, mental health, other) and district of residence.

Mental Health Knowledge Schedule

The MAKES measures mental health knowledge-related stigma in the general population and it can be used to evaluate anti-stigma interventions. It is a 12-item questionnaire composed of two sections: 1) six items covering knowledge related to help-seeking behavior, acknowledgment, support, work, treatment, and recovery; 2) six items that examine the classification of different conditions as mental illness. The authors designed this instrument according to evidence from previous studies and expert consultations. The items were intended to represent types of knowledge that might potentially influence mental health-related attitudes and behaviors. Items 7 to 12 were formulated as closed questions instead of traditional *vignettes*, for better assessment of factual information.¹²

The items are rated on a 5-point Likert scale, going from "strongly disagree" (i.e., 1 point) to "strongly agree" (i.e., 5 points). The answer "I don't know" was coded as neutral (i.e., 3 points) to determine the total score. Items 6, 8, and 12 are reverse coded. The total score is calculated by summing the ratings of all 12 items. A higher total score corresponds to greater knowledge (less knowledge related stigma).

In previous studies, validity was supported via extensive review by experts (including service users and international experts in stigma research). The MAKES showed an overall test-retest reliability of 0.71 using Lin's concordance statistic and a moderate overall internal consistency of 0.65 for items 1 to 6. A European Portuguese version of the MAKES was validated with a sample of patients by Camarneiro *et al* and obtained a Cronbach's α of 0.285.²⁶

Because the MAKES is designed to measure a heterogeneous group of items and is not developed as a homogeneous scale, high internal consistency is not expected. The α should only be used to interpret result trends. The MAKES should be used in conjunction with attitude and behavior-related instruments.¹²

Community Attitudes Toward the Mentally III

The CAMI scale assesses community attitudes towards people with mental illness in the general population. The original version is composed of 40 items and assesses four dimensions (authoritarianism, benevolence, social restriction, and ideology). It was partially based on a version of the Opinions About Mental Illness Scale.¹³

Two other distinct versions were developed, composed of 26 and 12 items, respectively. Both versions present a two-factor structure: prejudice and exclusion, and tolerance and support towards people with mental disorders.¹⁷

In this study we used the 12-item version (CAMI-12) for practical reasons. The answers were rated on a 5-point Likert scale going from "strongly disagree" (i.e., 1 point) to

"strongly agree" (i.e., 5 points). The overall score corresponds to the sum of the 12 items' ratings and higher overall scores correspond to less stigmatizing attitudes.

In an extensive systematic review, the CAMI scale showed a satisfactory global internal consistency ($\alpha \geq 0.80$ - between 0.60 and 0.90), that was not found in the sub-scales.¹⁹ There is a European Portuguese version of CAMI-27²⁷ and a Brazilian Portuguese version of CAMI-40²⁴ that obtained a Cronbach's α of > 0.60 and 0.84, respectively.

Reported and Intended Behaviour Scale

The RIBS is an instrument based on the Star Social Distance Scale that measures discriminatory mental health-related behaviors in the general population.¹⁴ The scale is composed of two sections, each one comprising four items. The first group evaluates reported behavior in past or present experiences with people with a mental health problem. The second group assesses future intentions to establish contact with people with a mental health problem. The overall score is calculated by adding the points obtained in the second section (items 5 - 8). These answers are coded into a Likert scale going from "strongly disagree" (i.e., 1 point) to "strongly agree" (i.e., 5 points). The answer "I don't know" is coded as neutral (i.e., 3 points). Higher scores correspond to more favorable intended behaviors.

In the original studies, the RIBS demonstrated an overall moderate test-retest reliability and substantial internal consistency (Cronbach's $\alpha = 0.85$). Strong consensus validity was found, as rated by service users/consumers and international experts in stigma research.¹⁴

A Brazilian Portuguese version of the RIBS obtained a 0.75 Cronbach's α .²⁵

Translation process

The European Portuguese versions of the three scales were developed based on "Guidelines for IOP Stigma Scales Translation, Back-translation, and Concept Checking"^{29,30}:

- 1) An English fluent native Portuguese speaker translated the three questionnaires into European Portuguese (PT version).
- 2) The PT version of the questionnaire was back-translated into English by an independent English native speaker who was fluent in Portuguese (EN-BT version).
- 3) To assess comprehensibility and face validity of the translated questionnaire items (PT version), a focus group was conducted, with eight community recruited volunteers. No changes were suggested.
- 4) The final step, to assess the content validity, was the comparison of the three versions (original EN, PT version, and EN-BT version) by a group of experts.

Minor changes were suggested to the PT version, thus creating the final version the participants were asked to fill in.

Statistical analysis

All statistical tests were two-tailed and a significance level was set at 0.05. We used the IBM SPSS Statistics version 28 for advanced statistical analysis and Jamovi 2.3.28 Solid for confirmatory factor analysis (CFA). Variables were described using descriptive statistics: absolute and relative frequencies were computed for nominal variables and central tendency measures for numeric variables.

The original MAKs two-factor model proposed by the authors¹² was compared with alternative models: a one-factor model and a modified two-factor model (excluding items 1, 6, 8 and 12) proposed by the French validation study.²¹ The original CAMI-12 two-factor model proposed by the authors¹⁷ was compared with a one-factor model. The original RIBS one-factor model¹⁴ was tested. The following fit indices were selected to assess the goodness-of-fit of the model: the Standardized Root Mean Square Residual (SRMR), the Root Mean Square Error of Approximation (RMSEA), the Comparative Fit Index (CFI) and the Tucker Lewis Index (TLI). Acceptable model fit was indicated by CFI and TLI values higher than 0.90; and RMSEA and SRMR values below 0.08.³¹

The reliability of the scales was conducted through internal consistency analysis using Cronbach's α , and McDonald's ω coefficient, and test-retest reliability.

Cronbach's α value above 0.90 indicates excellent internal consistency, above 0.80 good consistency, above 0.70 acceptable, above 0.60 questionable, above 0.50 poor and below 0.50 the internal consistency is unacceptable.³² However, in some social science research scenarios, an α of 0.60 is considered acceptable as long as the results obtained with this instrument are interpreted with caution and have the context of the coefficient computing into account.³³ Above 0.7 ω internal consistency values were considered acceptable.³⁴ Test-retest reliability was evaluated over a two-week period in a subsample of 27 participants, using the intraclass correlation coefficient (ICC), a two-way random-effect model and the absolute agreement definition. Intraclass correlation coefficients below 0.5 were considered to indicate weak reliability, between 0.50 and 0.75 moderate, between 0.76 and 0.90 good, and above 0.9 excellent reliability.³⁵

The validity of the scales was evaluated through analysis of convergent validity and known-groups validity.

Convergent validity was explored through the analysis of the correlation between the three instruments (Pearson's correlation) and the correlation with educational level (Spearman's correlation). We followed Evans (1996) sug-

gestion for the absolute value of r , considering it as follows: 0.00 - 0.19 'very weak'; 0.20 - 0.39 'weak'; 0.40 - 0.59 'moderate'; 0.60 - 0.79 'strong'; 0.80 - 1.0 'very strong'.³⁶

Data regarding the educational level was collected into six ordinal categories: primary school (category 1), middle school (category 2), secondary school (category 3); bachelor (category 4), master (category 5) and doctorate (category 6). We simplified this variable into another called "education", in which participants who had primary school (category 1), middle school (category 2) and secondary school (category 3) education were grouped into the "compulsory education" category, and participants who had bachelor (category 4), master (category 5) and doctorate (category 6) degrees were grouped into the "higher education" category. Independent samples t-tests were performed to explore the effect of education on stigma.

Known-groups validity was assessed based on proximity with someone with mental illness.³⁷

Proximity with someone with a mental illness was evaluated via RIBS' question number 4 ("Do you currently have, or have you ever had, a close friend with a mental health problem?"). Participants who answered "yes" to RIBS' question number 4 were placed into group 1 of "Proximity with someone with mental illness" variable and participants who answered "no" were placed into group 2. Participants who answered "I don't know" were coded as missing. Independent sample t-tests were performed to explore the effect of proximity with someone with mental illness on these three instruments.

We used Cohen's d as an effect size measure for independent samples t-tests. Cohen's guidelines were followed regarding its interpretation: 'small' ($d = 0.2$), 'medium' ($d = 0.5$), and 'large' ($d = 0.8$) effect size.³⁸

RESULTS

Sample characteristics

The sample was composed of 3556 participants. The mean age was 37 years old, 55.6% of the participants were single, 68.7% had higher education, 63.3% were employed and 56.6% worked in a field other than healthcare, as shown in Table 1.

Confirmatory factor analysis

Fit indices for the different factor models of MAKs, CAMI-12 and RIBS are presented in Table 2.

For the MAKs, Model 1 corresponds to the one-factor model; Model 2 corresponds to the original two-factor model and Model 3 corresponds to a two-factor model without items 1, 6, 8 and 12, as validated by the French validation study. Confirmatory factor analysis results showed that Model 1 and Model 2 did not provide any reasonable fit indicators. Model 3 had a better fit when compared to the

Table 1 – Sample characteristics

Age n = 3217	Mean (SD): 37 (± 12) Min - max: 18 - 83 Missing: 339
Marital status n = 3556	Single: 1977 (55.6%) Married/Cohabitant: 834 (23.2%) Divorced: 181 (5.1%) Widowed: 18 (0.5%) Other: 51 (1.4%)
Education level n = 3556	Primary school: 2 (0.1%) Middle school: 104 (2.9%) Secondary school: 1008 (28.3%) Bachelor: 1510 (42.5%) Master: 861 (24.2%) Doctorate: 71 (2.0%)
Professional situation n = 3556	Unemployed: 547 (15.4%) Employed: 2254 (63.3%) Retired: 59 (1.7%) Student: 696 (19.6%)
Professional field n = 3509	Health: 677 (19.3%) Mental health: 846 (24.1%) Other: 1986 (56.6%) Missing: 47
MAKS n = 3556	Mean (SD): 47 (± 4.6) Min - max: 25 - 60 Mean percentage of anti-stigma of 0.63
CAMI-12 n = 3556	Mean (SD): 48 (± 5.9) Min - max: 27 - 60 Mean percentage of anti-stigma of 0.63
RIBS n = 3556	Mean (SD): 17 (± 2.8) Min - max: 4 - 20 Mean percentage of anti-stigma of 0.81

other models and complied with recommended cutoff values regarding SRMR, RMSEA, and CFI, although TLI was marginally acceptable. The modified two-factor model structure solution, from now on designated as MAKS-8, was retained for reliability and validity analysis.

For the CAMI-12 scale, Model 1 corresponds to a one-

factor model and Model 2 comprises the original two-factor model, proposed by the CAMI-12 authors. Model 1 did not provide reasonable fit indicators. Model 2 showed a reasonable fit regarding SRMR and RMSEA, but CFI and TLI values were marginally acceptable. The two-factor model structure solution was retained for reliability and validity analysis.

For the RIBS, we tested the one-factor model, the original structure proposed by the authors. Confirmatory factor analysis results showed reasonable fit and complied with recommended cutoff values regarding SRMR, CFI and TLI. RMSEA values were marginal.

All the standardized factor loadings of the models retained were statistically significant [Appendix 1, Table 1 (Appendix 1: <https://www.actamedicaportuguesa.com/revista/index.php/amp/article/view/22377/15611>)]. The loadings of the items included in MAKS-8 ranged from 0.223 to 0.544; the loadings for the items included in CAMI-12 ranged from 0.266 to 0.697 and the loadings for the items included in RIBS ranged from 0.461 to 0.745.

Internal consistency

As shown in Table 3, Cronbach's α and the McDonald's ω coefficient of the MAKS-8 cannot be considered acceptable. The level of internal consistency was even lower when we analyzed the MAKS-8 subscales separately.

The Cronbach's α for the CAMI-12 scale was 0.641 indicating a questionable level of internal consistency and the McDonald's ω coefficient was 0.610, indicating an unacceptable level. When we analyze the subscales of CAMI-12 separately, the subscale "Prejudice and Exclusion" has acceptable internal consistency when it comes to both coefficients, as opposed to the subscale "Tolerance and Support" which fails to achieve an acceptable result.

The Cronbach's α for the RIBS was 0.87 and the McDonald's ω coefficient was 0.89, indicating good and acceptable levels of internal consistency, respectively.

Table 2 – Confirmatory factor analysis

Model	χ^2	df	p-value	SRMR	RMSEA	CFI	TLI
MAKS							
Model 1: One-factor model	3700	54	< 0.001	0.109	0.138	0.453	0.331
Model 2: Two-factor model	3437	53	< 0.001	0.108	0.134	0.492	0.367
Model 3: Modified two-factor model ^a	333	19	< 0.001	0.0456	0.0682	0.922	0.885
CAMI-12							
Model 1: One-factor model	1698	54	< 0.001	0.706	0.0888	0.700	0.634
Model 2: Two-factor model	931	53	< 0.001	0.0501	0.0683	0.840	0.801
RIBS							
One-factor model	49.6	2	< 0.001	0.0138	0.0818	0.994	0.982

^a: without items 1, 6, 8, 12.

χ^2 : Chi-Square; df: degrees of freedom; SRMR: Standardized Root Mean Square Residual; RMSEA: Root Mean Square Error of Approximation; CFI: Comparative Fit Index; TLI: Tucker Lewis Index

Table 3 – Internal consistency

	Items	Cronbach's α coefficient	McDonald's ω coefficient
MAKS-8	8	0.571	0.555
Modified Subscale I ^a	4	0.518	0.522
Modified Subscale II ^b	4	0.461	0.428
CAMI-12	12	0.641	0.610
Prejudice and Exclusion Subscale	6	0.708	0.706
Tolerance and Support Subscale	6	0.521	0.532
RIBS	4	0.870	0.880

^a: without items 1 and 6

^b: without items 8 and 12

Test-retest reliability

Test-retest reliability measured with an intra-class correlation in a subsample of 27 participants over a period of two weeks suggests that the MAKS-8, CAMI-12 and RIBS scales have good stability, as shown in Table 4.

Convergent validity

Correlations between scales

A Pearson correlation coefficient was computed to assess the linear relationship between the three scales [Appendix 1, Table 2 (Appendix 1: <https://www.actamedicaportuguesa.com/revista/index.php/amp/article/view/22377/15611>)]. We found statistically significant positive, but weak, correlations between the MAKS-8 and the CAMI-12 scales ($r = 0.325$, $p < 0.001$) and between the MAKS-8 and the RIBS ($r = 0.371$, $p < 0.001$). The correlation is moderate between the CAMI-12 scale and RIBS ($r = 0.427$, $p < 0.001$).

Correlations with educational level

Using Spearman's correlation, we found statistically significant positive, but low magnitude, correlations between the educational level and each one of the three instruments,

suggesting that higher educational levels are associated with greater knowledge [MAKS-8: $r(3554) = 0.136$, < 0.001], less stigmatizing attitudes [CAMI-12: $r(3554) = 0.201$, < 0.001] and more favorable behaviors [RIBS: $r(3554) = 0.036$, < 0.05] [Appendix 1, Table 3 (Appendix 1: <https://www.actamedicaportuguesa.com/revista/index.php/amp/article/view/22377/15611>)].

Merging the first three categories of the variable “educational level” (primary school, middle school and secondary school), in one group designated as “compulsory education”, and the last three categories (bachelor, master and doctorate) in another group, designated “higher education”, we obtained a simplified variable, designated as “Education”.

Analyzing this new variable using an independent t-test, we found statistically significant differences of small effect size between the means of MAKS-8 and CAMI-12, as shown in Table 5. The results indicate that participants with “higher education” showed greater knowledge and less stigmatizing attitudes, when compared to participants with “compulsory education”, in these two scales. Although the “higher education” group also had a higher mean in the

Table 4 – Test-retest reliability

	n	ICC	95% CI	p-value
MAKS-8	27	0.847	0.668 - 0.930	< 0.001
CAMI-12	27	0.777	0.507 - 0.899	< 0.001
RIBS	27	0.843	0.654 - 0.928	< 0.001

ICC: intra-class correlation using a two-way random-effects model and the absolute agreement definition; CI: confidence interval

Table 5 – Comparison between compulsory and higher education

	Education	n	Mean ($\pm$ SD)	t	p-value	Cohen's d	95% CI (d)
MAKS-8	1 - Compulsory	1114	32.86 ($\pm$ 3.710)	-7.538	< 0.001	-0.273	[-0.344, -0.201]
	2 - Higher	2442	33.84 ($\pm$ 3.555)				
CAMI-12	1 - Compulsory	1114	46.30 ($\pm$ 6.029)	-12.528*	< 0.001	-0.465	[-0.537, -0.394]
	2 - Higher	2442	48.97 ($\pm$ 5.608)				
RIBS	1 - Compulsory	1114	17.27 ($\pm$ 2.856)	-0.853	0.394	-0.031	[-0.102, 0.040]
	2 - Higher	2442	17.36 ($\pm$ 2.801)				

*: Equal variances not assumed

SD: standard deviation; t: t statistic (independent t-test)

RIBS than the “compulsory education” group, the difference was not statistically significant.

Known-groups validity

To analyze the known groups validity, we used the variable proximity with someone with mental illness.

The comparison of the instruments results’ means of two groups, participants with and without proximity to someone with mental illness, are shown in Table 6. We found that participants with proximity to someone with mental illness showed a higher level of knowledge, less stigmatizing attitudes and more favorable behaviors, of small effect size, towards people with mental illness, than the others.

DISCUSSION

Mental health-related stigma has a strong impact on people experiencing mental illness. The development and study of valid instruments for evaluating different dimensions of mental health-related stigma is essential for socio-behavioral assessment, as well as for the evaluation of anti-stigma interventions. This study was meant to provide additional evidence on the psychometric properties of three scales of stigma. The results obtained confirm the validity and reliability of the proposed European Portuguese version of the RIBS and an alternative modified version of MAKS is suggested for the Portuguese population. The CAMI-12 results were mixed.

Regarding the MAKS, the CFA of the different models suggests that a modified two-factor model might be the most suitable for the European Portuguese version when compared with alternative factorial solutions. The modified two-factor model implies the removal of items 1 (“Most people with mental health problems want to have paid employment.”), 6 (“Most people with mental health problems go to a healthcare professional to get help.”), 8 (“Stress”) and 12 (“Grief”), from the original version, similarly to the French version.²¹ The internal consistency level of the MAKS-8 scale and its subscales separately was considered poor or not acceptable, although higher than the one reported in some studies.^{26,39} The fact that previous studies

also found low internal consistency suggests that this result may not be due to our sample’s specificity but to the items’ content. As stated above, the MAKS scale evaluates a very heterogeneous set of questions regarding different areas of knowledge. There is evidence that mental health knowledge-related stigma is multidimensional and that the correct endorsement of some items does not ensure correct knowledge regarding other items. This is reflected in the statistics assessing internal consistency. The MAKS-8 scale showed a strong test-retest reliability, even higher than in the original study.¹¹ Overall, the MAKS-8 scale results were mixed, but mainly unacceptable based on the recommendations.

The CFA results indicate that the original two-factor model of the CAMI-12 scale might be the most adequate for the European Portuguese version. Previous research showed that the items of the CAMI considerably varied in their allocation among studies, raising questions regarding the quality of items. Regarding internal consistency, the results of the CAMI-12 scale were mixed, in line with most of the studies and also the European Portuguese version of the CAMI-27.²⁷ The results of the “Tolerance and Support” subscale were unacceptable, while the “Prejudice and Exclusion” subscale results were acceptable. The CAMI-12 scale showed moderate test-retest reliability, similar to other studies, including the Brazilian Portuguese CAMI-40 version.²⁴

For the RIBS, the CFA results confirmed the original structure proposed by the authors: the one-factor model. The RIBS obtained a good level of internal consistency, in agreement with the original study¹⁴ and higher than the one found for the Brazilian Portuguese version.²⁵ The RIBS showed moderate test-retest reliability, similar to other studies.²³

All the correlations tested in the validity analysis occurred in the hypothesized direction.

The three scales showed a positive, though weak, correlation, suggesting that these scales measure distinct dimensions of mental health-related stigma, which are also positively correlated.²¹

As anticipated, the MAKS-8, CAMI-12 and RIBS scores

Table 6 – Proximity with someone with mental illness (independent t-test)

	Proximity with someone with mental illness	n	Mean (± SD)	t	p-value	Cohen’s d	95% CI (d)
MAKS-8	1 - Yes	2567	33.94 (± 3.514)	7.392*	< 0.001	0.342	[0.255, 0.429]
	2 - No	634	32.72 (± 3.770)				
CAMI-12	1 - Yes	2567	48.74 (± 5.749)	8.212	< 0.001	0.364	[0.277, 0.452]
	2 - No	634	46.64 (± 5.889)				
RIBS	1 - Yes	2567	17.67 (± 2.673)	8.615*	< 0.001	0.407	[0.320, 0.495]
	2 - No	634	16.56 (± 2.974)				

*: Equal variances not assumed
SD: standard deviation; t: t statistic

were weakly and positively associated with educational level, supporting the evidence that higher levels of education are associated with greater knowledge, less stigmatizing attitudes, and more favorable behaviors.^{40,41}

Individuals with lower education backgrounds showed a higher tendency to avoid people with mental illness and to have more negative attitudes towards mental health problems, whereas individuals with higher education tended to be less authoritarian and less socially restrictive towards people with mental illness. It is postulated that education can help an individual become better informed and support the development of ethics that improve their attitudes towards mental illness.⁴²

Our investigation was able to determine that participants with compulsory education exhibited more knowledge and attitude-related stigma when compared to participants with higher education. They also reported more behavior-related stigma, although not statically significant.

Known-groups validity was assessed based on proximity with someone with mental illness. Research suggests that people who are familiar with someone with mental illness are less likely to show stigmatizing attitudes. On the other hand, the lack of familiarity with mental illness (mediated by fear and perceptions of dangerousness and unpredictability) frequently leads to social distance, as some studies suggest.⁴³

Proximity with someone with mental illness was assessed by RIBS' question number 4 ("Do you currently have, or have you ever had, a close friend with a mental health problem?"). The results showed it was significantly associated with higher scores on the MAKS-8, CAMI-12 and RIBS scales, implying greater knowledge, less stigmatizing attitudes, and more favorable behaviors. These results corroborate the existing evidence of a positive correlation between mental health-related stigma and reduced contact with people with mental illness.⁷

This study presents some limitations. First, the analysis was based on an online recruited convenience sample, which can limit the generalizability of the results. Second, the sample predominately comprised individuals with higher education, who might be more motivated to answer the questionnaire than the general population and may present better literacy in these domains. Third, although people's self-report on mental health-related stigma can be valid and trustworthy, we cannot disregard the social desirability bias. Fourth, this is a cross-sectional study, not allowing causal inferences. Fifth, it is important to notice that cross-cultural assessments and validation studies may have challenges due to cultural and linguistic differences or even methodological issues. There are cultural variations between Portugal, Brazil, and other Portuguese-speaking countries, as well as substantial oral disparities. Despite the standardiza-

tion of the orthography in Portuguese-speaking countries, the present study concerns exclusively to Portugal.

CONCLUSION

The findings of this study contribute with additional evidence on the validity and reliability of the proposed European Portuguese version of the RIBS. It appears to be a valid and reliable instrument to measure stigma and suggest the tool is appropriate for measuring stigma in the Portuguese population.

In an effort to optimize adequacy for the Portuguese population, an alternative modified version of the MAKS is suggested. The MAKS-8 showed mixed results, in line with previous studies^{24,26,27,39} and caution is suggested when using composite scores from this measure given the specificities of mental health knowledge. For the CAMI-12, our data support the use of the subscale "Prejudice and Exclusion".

Despite the acknowledged value of measuring mental health stigma using a three-dimensional approach, the additional evidence on the psychometric properties of the European Portuguese version of these three instruments suggests the need for additional research to propose refined sets of items for measuring knowledge and attitudes, which allow cross-cultural comparisons.

AUTHOR CONTRIBUTIONS

BL: Conceptualization, methodology, investigation, data curation, formal analysis, writing – original draft, writing – review and editing.

AM, MM: Conceptualization, methodology, investigation.

PM, TM: Writing – review and editing.

PA: Formal analysis.

ARG: Formal analysis, writing – review and editing.

All authors approved the final version to be published.

PROTECTION OF HUMANS AND ANIMALS

The authors declare that the procedures were followed according to the regulations established by the Clinical Research and Ethics Committee and to the Helsinki Declaration of the World Medical Association updated in October 2024.

DATA CONFIDENTIALITY

The authors declare having followed the protocols in use at their working center regarding patients' data publication.

COMPETING INTERESTS

The authors have declared that no competing interests exist.

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