Measuring Attitudes Towards Schizophrenia and Psychosis: Investigating the Prevalence of Stigma.

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Thesis Portfolio Abstract

Aims: This thesis portfolio focuses on public attitudes towards schizophrenia. The systematic review explored the way in which the Attribution Questionnaire (AQ-27) has been translated and culturally adapted to measure mental illness stigma. The empirical paper used Twitter to compare attitudes towards the terms schizophrenia and psychosis.

Methods: The systematic review identified all studies using a translated version of the AQ-27 to measure stigma towards schizophrenia. We assessed the quality of the original translation processes using the COSMIN Study Design Checklist. We also extracted data relating to the psychometric properties of the translated measures. The empirical paper sampled Tweets (n=500) containing the terms 'schizophrenia', 'schizophrenic', 'psychosis' or 'psychotic'. Quantitative content analysis was used to investigate the prevalence and type of stigmatising attitudes within Tweets.

Results: Forty-one studies using a translated version of the AQ-27 were included in the systematic review, including eleven languages. The methodological quality of the translation processes was variable. The Turkish, Italian and Arabic translations were rated highest for methodological quality. The empirical paper found that stigma was significantly more prevalent in Tweets using the terms psychosis/tic (70.9%) than Tweets using the terms schizophrenia/c (42.4%). Additionally, stigma was significantly more prevalent in Tweets using adjective terms (76.6%) than Tweets using nouns (36.4%).

Conclusions: Several translations of the AQ-27 have been produced. Various standardised translation frameworks are available to ensure that translated measures are valid and equivalent in the target culture. Psychosis was more frequently stigmatised on Twitter than schizophrenia. If schizophrenia is to be renamed, psychosis may not be a suitable replacement.

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Chapter One: Thesis Portfolio Introduction

This thesis portfolio consists of a systematic review and empirical paper on the topic of mental illness stigma. Chapter Two presents the systematic review which focused on the use of translated versions of a widely used measure of stigma, the Attribution Questionnaire (AQ-27). Chapter Three presents a bridging chapter, which links the narrative of the systematic review with the empirical paper. Chapter Four presents the empirical paper, which used Twitter to compare the prevalence of stigma towards the terms schizophrenia and psychosis. Chapter Five presents an overall discussion and critical evaluation which brings together the main findings from the systematic review and empirical project. The strengths and limitations of the work are discussed, and implications for clinical practice and research are considered.

Terminology

The systematic review explores the use of translated versions of the AQ-27 and appraises the methodological quality of the translation processes. Various concepts related to questionnaire translation and cross-cultural adaptation are considered as part of the quality assessment. Brief definitions of these concepts, as described within the literature (Beaton et al., 2000; Valdez et al., 2021) are provided below.

Cross-Cultural Adaptation

'Cross-cultural adaptation' has been defined as a process whereby linguistic and cultural adaptation issues are considered, during the process of preparing a questionnaire for use in another setting (Beaton et al., 2000). The aim of this is to produce equivalence in content between the source and target language versions of the questionnaire.

Equivalence

With regards to the cross-cultural adaptation of measures, 'equivalence' may be defined and assessed in terms of four key areas:

1. 'Semantic equivalence' is equivalence in the meaning of words.
2. 'Idiomatic equivalence' refers to the translations of colloquialisms or idioms.
3. 'Experiential equivalence' refers to the idea that the situations or experiences depicted in the source version fit in the target cultural context.
4. 'Conceptual equivalence' is the validity of the concept and experiences explored within the target cultural context.

Translation Processes

'Original language' or 'source language' refers to the primary language in which the measure is written.

'Target language' refers to the language into which the measure is being adapted.

'Forward translation' refers to the process of translating the source language instrument into the target language. It is often recommended that at least two forward translations are produced, to enable the translations to be compared and any discrepancies to be identified and resolved.

'Backward translation' refers to the process of translating the instrument back from the target language, into the source language. The purpose of this is to check for equivalence of the translation (i.e., to ensure that the translated version reflects the same item content as the original version). Two back-translations are usually considered a minimum.

The 'expert committee review' refers to a multidisciplinary group whose role is to consolidate all versions of the measure and develop the prefinal version for pilot testing. The

committee should include subject matter experts, the forward and back translators and ideally, the original developers of the questionnaire.

'Pre-testing' or 'pilot testing' refers to the field test of the prefinal translated measure within the target setting. This is the final stage of the adaptation process. The purpose of pilot testing is to check for equivalence and check for errors or deviations in the translation. Participants should be interviewed (probed) to explore their understanding of the items and response options.

Chapter Two: Systematic Review

A Systematic Review of Studies Using Translated Versions of the Attribution Questionnaire (AQ-27) to Measure Public Stigma Towards People with Schizophrenia.

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Abstract

Background and Objectives: The Attribution Questionnaire (AQ-27, Corrigan et al., 2003) is a widely used measure of public mental illness stigma. The AQ-27 was originally developed in the USA in the English language, however several translations have since been produced. This is the first review to explore the use of translated versions of the AQ-27 to measure stigma towards people with schizophrenia.

Methods: A systematic review was conducted. MEDLINE, PsycInfo and Web of Science were systematically searched between 2003 and 2024. The COSMIN Study Design Checklist was adapted to appraise the quality of the translation processes. Data were extracted relating to measurement properties (reliability and validity) of the translated measures.

Results: Forty-one studies were identified, spanning fifteen countries and eleven languages. Most studies (*n*=26, 63.4%) were located in Europe. Twelve original translations of the AQ-27 were identified, of which, four studies were primarily focused on translation and validation of the measure. The Turkish, Italian and Arabic translations were rated highest for methodological quality.

Conclusions: Researchers should consider the quality of the methodology used to develop existing translated versions of the AQ-27 before adopting them, as this may have implications for the validity and equivalence of the measure within the target culture. Translation frameworks are available to support the high-quality translation and cross-cultural adaptation of self-report measures.

Keywords: AQ-27, translation, cross-cultural, stigma, schizophrenia

Introduction

Defining Stigma

Mental illness stigma is pervasive across the world. Stigma has been defined in a variety of ways. Link and Phelan's[1] widely cited definition takes a sociocultural perspective, conceptualising stigma as consisting of several interacting components: the labelling of difference, stereotyping, separation of 'us' and them', status loss, and discrimination. Power differences (social, economic and political) are considered crucial to enabling stigmatisation. Other perspectives emphasise the role of culture and the social context in defining stigma, whereby stigma is thought to pose a threat to one's moral standing within the local social world.[2,3]

Stigma is associated with health inequalities. This may include reduced social participation and difficulties accessing fundamental rights and services, such as housing, healthcare and opportunities for education and employment.[4,5]. Recovery-oriented mental health services are inaccessible to most of the global population and stigma may be a further barrier to help-seeking.[5]

The reduction of stigma, discrimination and human rights violations towards people with mental health difficulties has been identified as a key priority within the WHO Comprehensive Mental Health Action Plan (2013-2030).[6] Research is needed across different cultural settings to explore the efficacy and feasibility of methods to address stigma.[6,7]

Measuring Stigma

Stigma has been studied extensively over the past few decades. Alongside this, there has been a significant uptake in the number of stigma measures being developed. Fox et al.[8] conducted a systematic review of studies using mental illness stigma measures between 2004 and 2014. Over 400 different stigma measures were identified and of note, over two thirds of

these measures were created for a specific study and had not been systematically psychometrically evaluated. This suggests that the field is at saturation point with regards to the development of new measures. Clearly, there is a need for greater convergence within the field and this should include psychometric evaluation and validation of existing, well-used measures.

While reducing stigma has been described as a global priority,[6] within the literature there is a predominance of studies focusing on Western, English-speaking countries and cultures. Thornicroft et al.[9] conducted a narrative review of anti-stigma intervention research (1970-2012) and found that 83% of studies took place in high-income countries, with just 17% taking place in middle-income countries. Strikingly, fewer than 30% of studies took place in a country other than the US. This indicates a need for research across a wider range of cultural settings, to better understand cross-cultural differences in stigma.[10] Additionally, there is a need for further research within LMICs, given that the generalisation of methods and findings from research conducted in high-income countries is not advisable.[9]

Most stigma measures have been developed in the English language, for use in English-speaking countries.[11] It has been suggested that within non-English-speaking countries there are two main approaches to quantitative stigma measurement.[11] Firstly, a new measure may be developed. This is likely to be a time-consuming process. Secondly, an existing measure may be translated, adapted and psychometrically evaluated within the target cultural context. Research suggests that the latter is more common. Indeed, Yang et al.[12] conducted a systematic review of stigma research with non-Western European cultural groups (1990 – 2012) and found that 77% (*n*=151) of included studies used adaptations of existing, Western-developed stigma measures. While this approach may not account for culturally specific aspects of stigma, the translation and use of existing, standardised measures may facilitate comparisons across linguistic and cultural settings.[11] Notably, within Yang et al.'s [12]

review, the most common study locations were North America (46%) and Europe (45%); there was a lack of research taking place in Eurasia, Africa and South America.

To summarise, it appears that much stigma research has been conducted in high-income Western countries. There is increasing recognition that this is a problem within psychological research in general, whereby most research focuses on participants from Western, Educated, Industrialized, Rich, and Democratic ('WEIRD') societies,[13] yet findings are assumed to be universally applicable, rather than culturally specific. Further research is required to better understand cross-cultural differences in stigma.

The AQ-27

Within Fox et al.'s[8] review, Corrigan et al.'s[14] Attribution Questionnaire (AQ-27; Appendix B) was identified as one of the most widely cited stigma measures. To date, the paper has been cited 1,830 times on Google Scholar (checked on 10th March 2024). The AQ-27 is a self-report measure of public stigma which was developed in the USA in 2003. It contains a brief vignette, as follows:

'Harry is a 30-year-old single man with schizophrenia. Sometimes he hears voices and becomes upset. He lives alone in an apartment and works as a clerk at a large law firm. He has been hospitalized six times because of his illness'.

This is followed by twenty-seven statements which measure nine domains related to stigma: blame, anger, pity, help, dangerousness, fear, avoidance, segregation and coercion. Respondents rate their agreement with each statement on a nine-point Likert scale. The AQ-27 is informed by attribution theory, which aims to explain the relationship between stigmatising attitudes and discriminatory behaviour.[15] The AQ-27 assesses respondents' causal attributions about the cause and controllability of mental illness, their emotional responses and the likelihood of helping or rejecting behaviour.

The AQ-27 was originally designed to measure stigma towards people with schizophrenia as the condition is frequently associated with public perceptions of dangerousness.[14] Contemporary research suggests that schizophrenia remains one of the most stigmatised psychiatric diagnoses today.[16,17] A multinational study by Thornicroft et al.,[18] surveying 732 people with a diagnosis of schizophrenia across 27 countries identified high rates of experienced discrimination, most commonly within friendships, family relationships and in finding and maintaining employment.

Translation and Cross-Cultural Adaptation of the AQ-27

Translation has been defined as the process of transferring meaning from a 'source language' (the primary language in which a measure is written) into a 'target language'.[19] The translation and cross-cultural adaptation of measures is a complex process, requiring consideration of several factors related to equivalence within the target culture. This includes, for example semantic equivalence (equivalence in the meaning of words) and experiential equivalence (the relevance of situations or experiences described, for people within the target cultural context).[11] Various guiding frameworks for the cross-cultural adaptation of health-related measures have been produced,[11,20,21] which outline a rigorous, multi-stage process. The extent to which these processes are followed will have a bearing on the quality and validity of the translated instrument. Following translation, measures need to be psychometrically evaluated within the target cultural context.[22]

Research Questions

This systematic review is divided into two parts:

1) Overview of the use of translated versions of the AQ-27. With what populations, and within what cultural contexts have translated versions of the AQ-27 been used?

2) Assessment of the quality of the translation and adaptation process, within original translation studies.
    a) What languages has the AQ-27 been translated into, from English?
    b) What is the quality of the procedures used to translate and adapt the AQ-27?
    c) What is known about the reliability and validity of translated versions of the AQ-27?

Method

Registration

This systematic review was registered on the International Register of Prospective Systematic Reviews (PROSPERO) on 29th June 2023 (registration number CRD42023440611).

Search Strategy

The systematic search was completed on 19th September 2023, followed by an update search on 14th January 2024. Searches were carried out with a date limitation from July 2003 until 19th September 2023, in three electronic databases: MEDLINE (PubMed), Web of Science and PsycINFO (EBSCO). To increase the chance of retrieving international papers, Google Translate was used to translate key search terms into the ten most common languages spoken worldwide[23] (Mandarin Chinese, Spanish, Hindi, Portuguese, Bengali, Russian, Japanese, Yue Chinese, Vietnamese and Turkish) and these were added to the search strategy. Therefore, the search terms used were:

“attribution questionnaire” OR “AQ-27” OR “AQ27” OR "问卷分配" OR "asignación de cuestionario" OR "प्रश्नावली असाइनमेंट" OR "atribuição de questionário" OR "প্রশ্নপত্র নিয়োগ" OR "задание анкеты zadaniye ankety" OR "アンケートの割り当て" OR "bài tập câu hỏi" OR "anket ödevi".

Eligibility Criteria

Inclusion Criteria

Studies included in the review were published, peer-reviewed empirical studies which used a translated version of the AQ-27 (from English, into another language) to measure stigma, primarily towards people with schizophrenia. Studies which translated an abbreviated version of the AQ-27, such as the AQ-9 were included. Studies which modified the wording or structure of the AQ-27 as part of the translation and adaptation process were included.

For Part Two, an additional criterion was applied. Only studies carrying out an original translation of the AQ-27 were included (i.e., studies which used an existing translated version of the measure were excluded).

Exclusion Criteria

Studies were excluded based on the following criteria:

a) The AQ-27 was explicitly modified to measure stigma towards a condition other than schizophrenia, or mental illness in general.
b) The study assessed stigma towards multiple conditions (i.e., the primary focus was not schizophrenia).
c) The AQ-27, or abbreviated version was not used in full (e.g., only one subscale was used).
d) It was not explicitly stated that the AQ-27 was translated into another language.
e) Articles not available in English language.
f) For Part Two, studies which carried out an original translation, but provided no description of the translation process.

We recognise that exclusion criterion (e) is arguably in tension with the core project aims. However, the use of raw machine translation output alone, without the input of qualified human translators, was ruled out for the purposes of the current review due to concerns around the quality and accuracy of the translations. While neural machine translation (NMT), used by systems such as Google Translate is widely regarded as the best performing type of machine translation invented to date, NMT can be inaccurate, is known to output words that do not exist in the target language, and can also amplify biases.[24] Moreover, despite literature calling for greater emphasis on publication of non-English papers, the reality remains that most scientific literature is published in the English language, arguably limiting the practical impact of this pragmatic decision.[25,26]

Screening and Selection

Studies identified by the searches were extracted into Microsoft Excel. After duplicates were removed, titles and abstracts were screened for eligibility and removed if they clearly did not meet criteria. The remaining articles were read in full, and if they were excluded they were coded as to the primary reason for exclusion. A subset of full-text articles (20%) were checked by the fourth author, LM, blind to the ratings of the primary reviewer to ensure that they met eligibility criteria.

Quality Assessment

Quality assessment was used to assess the rigour of the translation processes, for studies carrying out an original translation of the AQ-27. Due to the wide variance in research designs, it was not possible to identify an existing quality appraisal tool which was applicable to all included studies. Therefore, selected items from the COSMIN Study Design Checklist[27] were used to appraise the methodological quality of the translation processes (Appendix C). The COSMIN contains standards relating to measurement properties and additionally, the

translation of existing patient-reported outcome measures. Items are rated on a four-point scale, whereby a score of 4 indicates the highest methodological quality. Items are weighted according to relative importance. Although the COSMIN does not require the use of an overall quality rating,[27] in the present study we calculated a total score by summing the scores for all elements considered. Therefore, the maximum possible overall score was 60.

Translation standards outlined within the COSMIN appear generally consistent with standardised translation guidelines from the literature,[11,28] including Beaton et al.'s[20] widely cited paper, 'Guidelines for the Process of Cross-Cultural Adaptation of Self-Report Measures'. These guidelines emphasise key processes such as forward-backward translation, an expert committee review and preliminary pilot testing. The COSMIN has been used in previous reviews relating to questionnaire translation.[29]

Using the COSMIN, the first author, CT independently conducted quality assessments. For inter-rater reliability, LM completed quality ratings for 25% of included studies (n=4). Any discrepancies were discussed and resolved.

Data Extraction

For Part One of the review, the following data were extracted: name of translated measure, language, country, study design, sample size and demographic information, research aims and main findings.

Part Two of the review focused on studies which carried out an original translation of the AQ-27. Data relating to the translation process, measures of internal consistency (factor analysis, Cronbach's alpha) and test-re-test reliability (intraclass correlation coefficients) were extracted. This was primarily guided by the COSMIN checklist, but also informed by quality criteria reported elsewhere.[22,30] Details of any modifications to the AQ-27 were collected.

Analysis

A narrative synthesis approach[31] was used to describe the current literature reporting on the use of translated versions of the AQ-27. Data were tabulated to enable patterns to be identified. Studies were grouped by language and the version of the measure used. Studies were ordered according to frequency of the translation (modal translations first) and year of publication (newest first).

Results

Search Results

A PRISMA Flow Diagram is shown in Figure 1. A total of 1,404 papers were identified from the initial searches. Following removal of duplicates, 1,099 papers remained to be screened. After title and abstract screening, 273 papers were read in full and assessed against the eligibility criteria.

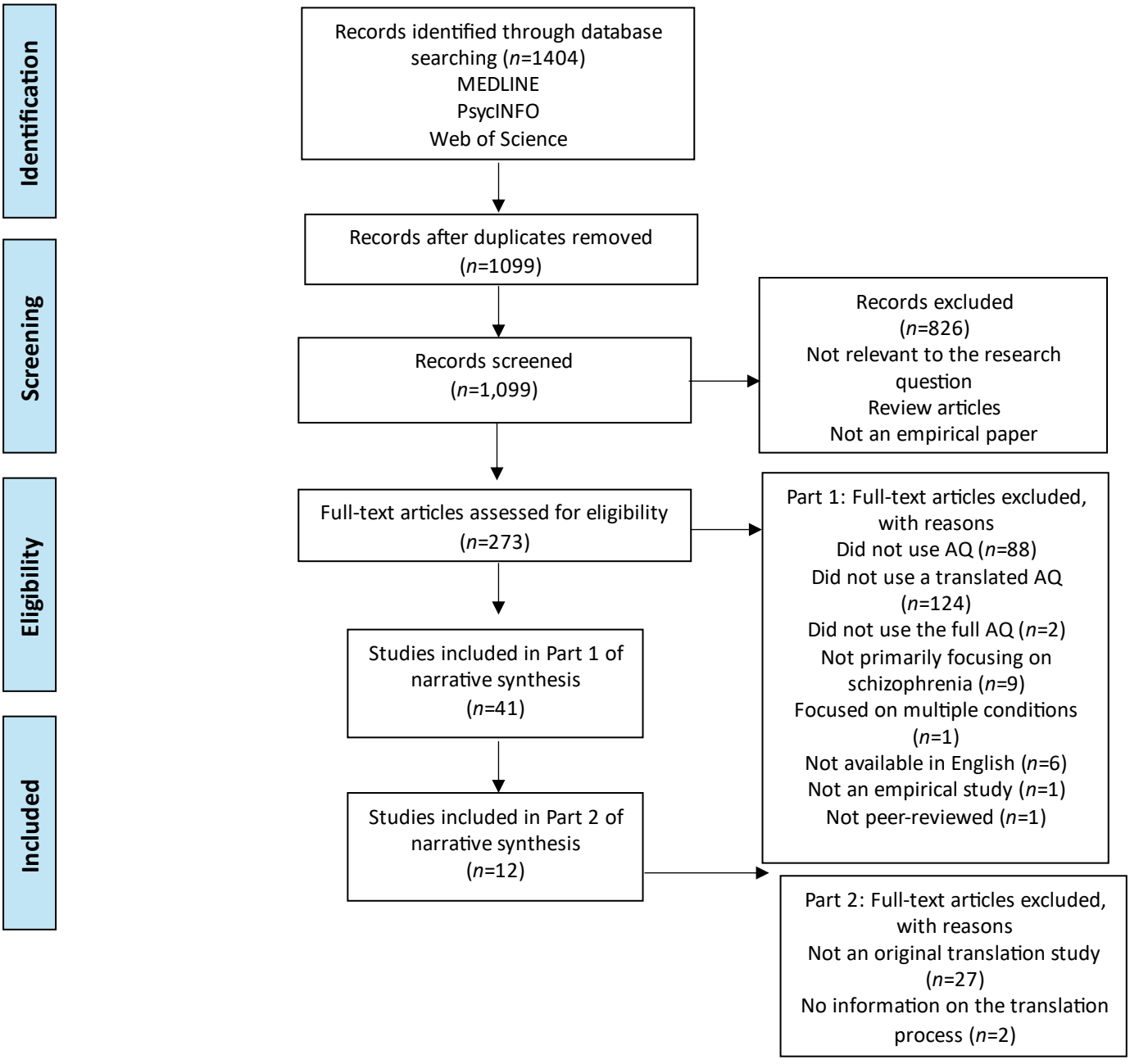
Forty-one studies were identified as eligible for inclusion in Part One of the review. Of those, two papers were obtained during the updated search. The 41 papers were then screened for eligibility for inclusion in Part Two of the review. Twelve studies were identified as eligible. Of the papers independently checked by LM there was 100% agreement.

Six papers (all originating from Western Europe) were excluded due to the full-text articles not being available in the English language. These included a German translation of the revised AQ-9 adapted for adolescents,[32] an adaptation of the Portuguese version of the AQ-27 for Brazilian speakers,[33] an 8-item Spanish translation of the revised AQ-9 for adolescents[34] and a Spanish translation of the AQ-14.[35] Due to the limited access, it was not possible to establish with certainty that these studies would have met eligibility criteria. However, it is possible that these papers would have been included in the review had English

translations been available. Of the excluded papers, German is the only language which has not been represented within the current review.

Figure 1.

PRISMA Flow Diagram (Liberati et al., 2009)



1) Overview of the Use of Translated Versions of the AQ-27: With What Populations, and Within What Cultural Contexts Have Translated Versions of the AQ-27 Been Used?

Study Characteristics

Language and Country of Study

Forty-one studies used a translated version of the AQ-27 to measure stigma towards people with schizophrenia. A summary of the study characteristics and key findings can be found in Table 1.

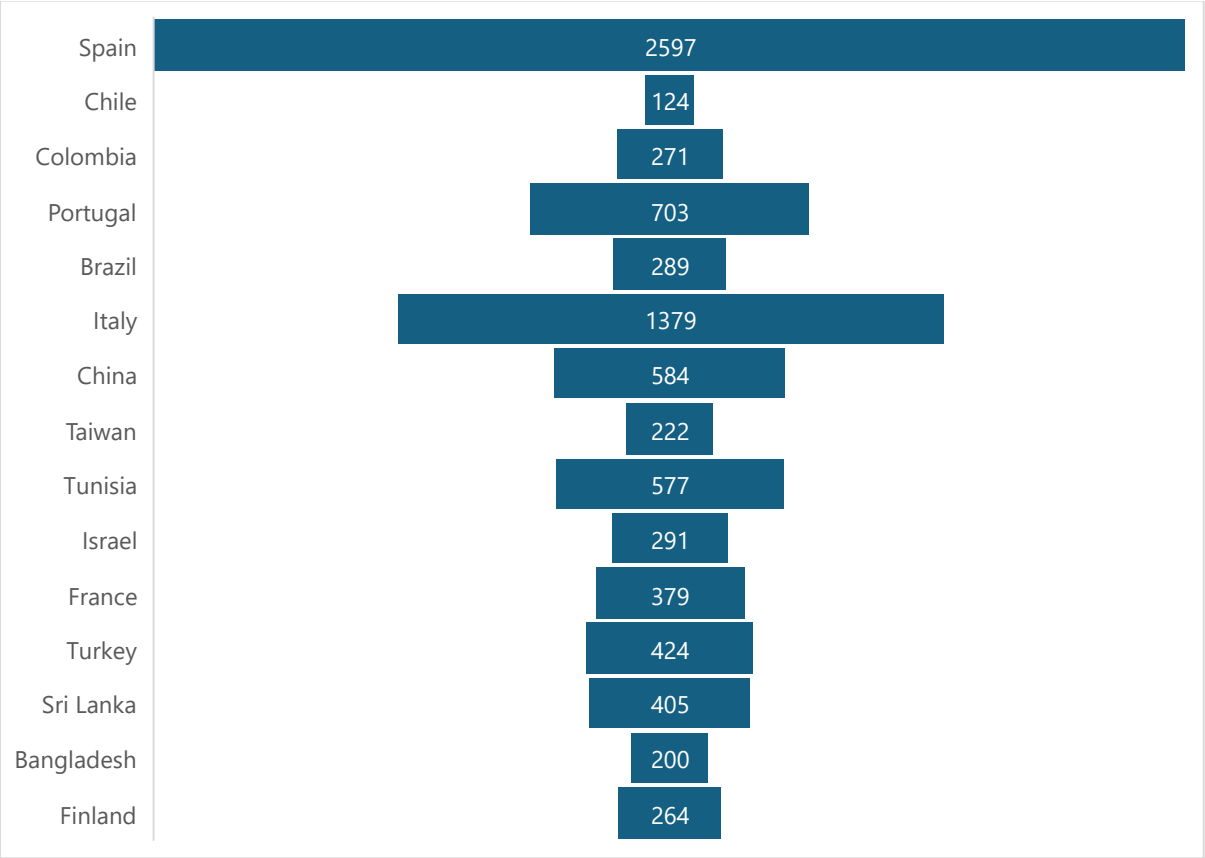
We identified that the AQ-27 has been translated into eleven languages, including Spanish (*n*=16 studies), Portuguese (*n*=6), Italian (*n*=5), Chinese languages (*n*=4; note, the specific Chinese languages were not reported), Arabic (*n*=3), Hebrew (*n*=2), French (*n*=1), Turkish (*n*=1), Sinhalese (*n*=1), Bengali (n=1) and Finnish (*n*=1).

Studies took place across fifteen countries. Most studies took place in Europe (*n*=26; 63.4%), with the most common location being Spain (*n*=14), followed by Portugal (*n*=5), Italy (*n*=5), France (*n*=1) and Finland (*n*=1). Nine studies (22%) took place in Asia, including Taiwan (*n*=2), Hong Kong (*n*=2), Sri Lanka (*n*=1), Bangladesh (*n*=1), Israel (*n*=1) and Turkey (*n*=1). Three studies (7.3%) took place in South America, including Chile (*n*=1), Colombia (*n*=1) and Brazil (*n*=1). Three studies (7.3%) were carried out in Africa, in Tunisia (*n*=3).

The total sample sizes for each country represented in the review are shown in Figure 2. The largest total samples were obtained from Spain (*n*=2,597), Italy (*n*=1,379) and Portugal (*n*=703), representing 53.7% of the total sample within the review.

Figure 2.

Total Sample Size for Each Country Represented Within the Review



Participant Characteristics

In total, 8,709 participants were recruited. Sample sizes ranged from 22,[37] to 2,746.[38] Most studies (*n*=35, 85.4%) consisted of a majority female sample (≥ 50%). The mean age of participants, where reported ranged from 17.8 to 54.9 years. Unfortunately, ethnicity was not reported on, therefore we are unable to comment on this.

Studies sampled from a range of populations, including university students (*n*=17, 41.5%), the general public (*n*=8, 19.5%), mixed populations (*n*=5, 12.2%), health professionals (*n*=4, 9.8%), high school students (*n*=3, 7.3%), service users (*n*=1, 2.4%), service users' relatives (*n*=1, 1.2%), school staff (*n*=1, 1.2%) and college students (*n*=1, 1.2%).

Study Design

A wide variety of study designs were observed. These included cross-sectional studies (*n*=17, 41.5%), quasi-experimental designs (*n*=8, 19.5%), studies investigating measurement properties of the AQ-27 (*n*=7, 17.1%), correlational studies (*n*=6, 14.6%), randomised controlled trials (*n*=3, 7.3%), and mixed designs (*n*=1, 2.4%).

Table 1.

Overview of Study Characteristics (Part One)

Authors (year)	Version of AQ used, author	Country	Study design	Sample size, age range (mean), % female	Participant occupation	Aims	Main findings
				Spanish (*n*=14)			
Muñoz et al. (2015)[a]	Spanish AQ-27 (AQ-27-E)	Spain	Measurement properties	439, mean age 39 years, 52.6% female	Residents in Madrid	To translate and analyse the psychometric properties of the Attribution Questionnaire for use in Spanish-speaking populations (AQ-27-E), and to test the dangerousness and responsibility models of mental illness stigma in a Spanish sample.	"The AQ-27-E has acceptable psychometric properties comparable to previous versions, which can be used to assess stigma in Spanish-speaking populations."
Atienza-Carbonell et al. (2024)	As above	Spain	Cross-sectional	506, mean age 31.5 (students) and 42.1 years (general population), 65.6% female	University students and general population	To compare stigmatizing attitudes, reported and intended behavior, and knowledge of mental illness between university students and the general population.	"Those who had lived with someone with mental health problems exhibited more positive attitudes. University students reported greater knowledge of mental illness than the general population. Students only scored higher in the 'blame' domain of the AQ-27."
Ayuso et al. (2023)	As above	Spain	Quasi-experimental (pre/post intervention)	22, mean age 48 years, 82% female	Secondary school teachers and counsellors	To assess whether an anti-stigma programme was beneficial and feasible in reducing stigma towards First Episode Psychosis among counsellors and teachers.	"Significant differences in all subscales, apart from Responsibility and Pity, were observed from pre-post intervention."
Martínez-Martínez et al. (2024)	As above	Spain	Quasi-experimental	166, mean age 18.5 years, 81.3% female	Students at technical or	To assess the effectiveness of a direct contact intervention in the classroom by persons with lived	"Statistically significant differences were observed in the

			(pre/post intervention)		vocational schools	experience to reduce vocational students' stigmatizing attitudes.	scores of 11 of the 13 dimensions measured with the AQ-27-E. Vocational students' negative attitudes and emotions can be improved through a direct contact intervention in the classroom."
Ruiz et al. (2022)	As above	Spain	Cross-sectional	325, 67.7% female, age not reported	University students	To describe and compare stigma toward MI among students enrolled in five university degree courses.	"Results indicated different profiles of stigma in relation to the degree studied, gender and already knowing or living with a person with mental illness."
Martínez-Martínez et al. (2019)	As above	Spain	Quasi-experimental (pre/post intervention)	185, mean age 23.7, 83.6% female	Mental health nursing students	To design and measure the effectiveness of an intervention involving direct contact with people who had lived experience of mental illness.	"Pre/post scores indicated a decrease in fear, feelings of danger, avoidance, segregation, and coercive attitudes, while positive feelings increased, including a tendency to help and compassion."
Mullor et al. (2019)	As above	Spain	Randomised controlled trial	106, mean age 23.9, 76.4% female	Undergraduate psychology students	To compare the effectiveness of a game focused on reducing stigma toward mental health illness with other traditional procedures utilized in different stigma awareness programs.	"The game had an effect similar to those of direct contact with mental health patients and the talk by a professional with regard to dangerousness, avoidance, segregation, and anger."
Frias et al. (2018)	As above	Spain	Mixed (cross-sectional and quasi-experimental)	Experiment 1: 42, 19-64 years (33), 0% female Experiment 2 (general population): 64, 19-77 years (44), 62.1% female	Football club members, general public	To examine differences in the level of stigma in samples with social contact and the general population.	"Social contact lowers the stigma against people with mental disorders. Regular, prolonged contact with people who have a mental disorder appears to lead to less stigma than occasional, limited contact over time."

				Experiment 2, contact sample: 100, 19-87 years (55), 69% female			
González-Sanguino et al. (2023)	Spanish AQ-9, Muñoz et al. (2015)	Spain	Cross-sectional	2,746, 18-89 years (46), 54.3% female	General population	To analyse the mental health stigma in a representative sample of the Spanish population.	"The best predictors of stigma are attitudes, attributions and intention of social distance themselves. Progressive political ideology is related to less stigma in all dimensions. Knowing someone with mental health problems and talking openly about it together with higher education are also relevant protectors."
González-Sanguino et al. (2019)	As above	Spain	Cross-sectional	102, 59.6% female	Undergraduate psychology students, general population	To analyse the possible relationship between implicit and explicit stigma.	"Significantly lower AQ-9 scores were found in the student group. A greater desire for social distance was related to older age, belonging to the general population group and not having a diagnosed relative. In contrast, greater implicit stigma was found in people who had a family member with a diagnosis."
Muñoz et al. (2011)[a, d]	Spanish AQ-27	Spain	Cross-sectional	108, mean age 36.8 years	People receiving treatment for severe and persistent mental illness	To study the relationships between principal variables involved in the functioning of internalized stigma in a sample of people with severe and persistent mental illness.	"Results indicate the relationships among social stigma, discrimination experiences, recovery expectation, and internalized stigma and their role in psychosocial and behavioural outcomes in schizophrenia spectrum disorders."

Martínez-Hidalgo et al. (2018)	As above	Spain	Quasi-experimental (pre/post intervention)	47, mean age 21 years, 48% female	Community sample	To assess the effectiveness of a social contact program between young adults and adolescents with and without mental health problems.	"Results revealed a statistically significant (moderate to large effect sizes) reduction in self-stigma in participants with mental health problems after participating in the social contact program."
Saavedra et al. (2021)	Spanish AQ-27 (Corrigan, 2012)	Spain	Measurement properties	385, mean age 20.3 years, 73% female	University students	To analyse the responses of a sample of Spanish students to the AQ27 questionnaire, in order to assess the factorial structure of its version in Spanish.	"We have obtained a tool with 14 items and four factors, and some reliable psychometric indexes and convergent validity. The factors obtained were dangerousness-fear, lack of solidarity, coercion and avoidance."
Rodríguez-Rivas et al. (2023)	As above	Chile	Randomised controlled trial	124, 18-35 years (21.9), 55.6% female	University students	To evaluate the effect of an immersive VR program on the stigma levels of healthy volunteer university students toward people with SMI.	"Results revealed a reduction in overall stigma levels on the AQ-27 scale and its three subscales: dangerousness-fear, avoidance, and lack of solidarity. This provides preliminary support for the Inclúyete-VR software as a useful tool to reduce stigma among university students toward people with SMI."
Chamorro Coneo et al. (2022)[a]	Colombian-Spanish adaptation of the AQ-27	Colombia	Cross-sectional	271, 18-79 years (32), 67.4% female	Community sample	To examine pathogen-disgust sensitivity and danger appraisal mechanisms in responses of stigma towards SMI.	"Findings suggested that pathogen avoidance and danger appraisal systems interplay in the generation of discriminatory behaviour towards SMI."
Crespo et al. (2008)[a, d]	Spanish AQ-27	Spain	Cross-sectional	439, mean age 39 years, 52.6% female	Community sample	To analyse the stigma associated with severe and persistent mental illness in the general population of Madrid.	"Participants showed adequate general knowledge about mental illness, but a high degree of confusion with mental

							retardation. Stigmatizing attitudes focused mainly on the disposition to help and on pity."
				Portuguese (*n*=7)			
Fernandes et al. (2022)	Preliminary Portuguese AQ-27, Sousa et al. (2008)[c]	Portugal	Cross-sectional	100, mean age 22 years, 91.8% female	Undergraduate nursing students	To assess the stigmatising attitudes and beliefs of nursing students and examine their relationship with psycho-socio-demographic variables.	"Fourth-year students, who already had psychiatry placements, were less likely to show stigma. Those with a family history of mental illness were less prone to show coercion. Those with a history of mental health treatment were more likely to help. Students who considered working in mental health were less prone to show anger, avoidance and think of patients as dangerous."
Querido et al. (2020)	As above	Portugal	Quasi-experimental (pre/post intervention)	99, 20-40 years (22.0), 88.9% female	Nursing students	To assess the effectiveness of an intervention to reduce stigmatizing attitudes and anxiety towards people with mental illness among nursing students.	"The intervention reduced students' anxiety towards people with mental illness, which led to a reduction of stigma. The intervention did not reveal significant effects concerning global stigma, nor intergroup anxiety."
Sousa et al. (2012)	As above	Portugal	Cross-sectional	40, 35-75 years (54.9), 70% female	Relatives of patients with schizophrenia	To evaluate the presence of stigmatizing attitudes towards patients diagnosed with schizophrenia in a group of relatives of patients with this disorder seen at the psychiatric service of a major general hospital.	"Participants expressed positive, little stigmatizing attitudes towards people with schizophrenia, probably as a result of their familiarity with severe mental disorder, an adequate attribution process, and low levels of perceived dangerousness. However, the high scores of coercion, pity, and segregation may reflect concealed stigmas that may

							influence the self-determination of the mentally ill."
Oliveira et al. (2020)	Portuguese AQ-27, Sousa et al. (2012)	Portugal	Cross-sectional	353, 17-73 years (29.8), 65.2% female	Students, non-psychiatry doctors, psychiatry specialists	To assess the attitudes of medical students, non-psychiatry doctors, and psychiatry specialists.	"Psychiatrists displayed the lowest levels of stigmatizing attitudes in all the items of the AQ-27, followed by students. Regression analyses revealed that professional group and presence of a relative with mental illness were the factors that have a significant impact on levels of stigmatization."
Pinto et al. (2020)	Preliminary Portuguese AQ-27, author not stated	Portugal	Cross-sectional	111, mean age 21.1 years, 71.2% female	Medical students	To assess the differences of mental health stigma attitudes and behaviours against people with mental illness, comparing medical students from different years.	"Final-year students expressed more positive and less discriminatory attitudes toward people with severe mental illness than first-year students. This is likely due to education and contact opportunities promoted throughout the medical school, as well as due to the experience of having gone to a psychology or psychiatric consultation."
Moro & Rocha (2022)	Brazilian AQ-26-B, Pereira et al. (2016)	Brazil	Correlational	289, 21-64 years (39.6), 90.3% female	Primary care professionals	To analyse the association between mental health stigma among Primary Care professionals in relation to sociodemographic variables, contact and participation in mental health actions.	"Less attribution of stigma is related to greater knowledge of mental health, having mental health training, and performing mental health activities. Among the variables that most influence the relationship between knowledge and the attribution of stigma are personal contact, training, and performing mental health actions."

				Italian (*n*=5)			
Pingani et al. (2012)[a]	Italian AQ-27 (AQ-27-I)	Italy	Measurement properties	214, 18-89 years (40.2), 52.3% female	Relatives of university students	To translate the Attribution Questionnaire-27 (AQ-27) to the Italian language (AQ-27-I), and to examine the reliability and validity of this new Italian version.	"The AQ-27-I demonstrated acceptable internal consistency. Test–retest reliability was also satisfactory. Fit indices of the model supported the factor structure and paths. The AQ-27-I is a reliable measure to assess stigmatizing attitudes in Italian."
Pingani et al. (2022)	As above	Italy	Correlational	311, mean age 33 years, 61.4% male	General public	To assess how religion-based negative causal attributions of mental illness may be associated to stigmatising attitudes and behaviours that contribute to public stigma in an Italian convenience sample.	"This study allows the identification of variables that seem to activate or attenuate the models of Personal Responsibility and Dangerousness."
Pingani et al. (2021)	As above	Italy	Quasi-experimental (pre/post intervention)	266, mean age 21.9 years, 83.1% female	Undergraduate psychology students	To examines whether participation in clinical psychology lessons reduces levels of stigmatisation in psychology students.	"A statistically significant reduction was seen in all six scales and the total score on the AQ-27-I. The models defined by the SEM (pre- and post-intervention) showed excellent model fit indices and described different dynamics of the phenomenon of stigma."
Ferrari et al. (2020)	As above	Italy	Measurement properties	277, mean age 17.8 years, 72.2% female	High school students	To describe the psychometric characteristics of the AQ-27-I in a high school student population.	"The AQ-27-I demonstrated acceptable internal consistency. Fit indices were very positive for the Dangerousness Model supporting the factor structure and paths of the original version."

Pingani et al. (2016)	As above	Italy	Measurement properties	311, mean age 22.8 years, 69.8% female	High school students	To investigate the levels of public stigma in an Italian university population.	"The AQ-27-I showed good psychometric properties with an α = .68, and the fit indices of the models that partially supported the factor structure and paths."
				Chinese (*n*=4) [b]			
Ran et al. (2022)[a]	Chinese AQ-9	Hong Kong	Correlational	366, 75.4% female	Family members, mental health workers, community residents	To explore the relationship between the multiple dimensions of contact and stigma of mental illness among family members (FM), mental health workers (MHW) and community residents (CR) in Hong Kong.	"MHW had higher knowledge, more contact and lower stigma of mental illness than CR or FM. Knowledge and contact quality were significantly associated with lower stigma of mental illness in the three groups. Contact level was positively associated with stigma of mental illness among FM and CR."
Chiu et al. (2021)[a]	Modified Chinese AQ	Taiwan	Cross-sectional	123, mean age 21.7 years, 41.5% female	Medical students	To compare the differences of public stigma, self-stigma, and social distance associated with schizophrenia between old and new name of schizophrenia in Taiwanese medical students.	"After renaming schizophrenia, we noted significant differences in the scores in the modified AQ, the perceived psychiatric stigma scale, and the modified social distance scale in all participants and the fourth-year students, respectively."
Chiu et al. (2022)	As above	Taiwan	Cross-sectional	99, mean age 21.4 years, 80.8% female	Nursing students	To investigate the effects of renaming schizophrenia on its stigma in nursing students.	"Renaming significantly reduced public stigma, self-stigma, and social distance. Regarding the old and new names for schizophrenia, the fourth-year nursing students scored significantly higher on public stigma and self-stigma than did the first-year students."

Ho et al. (2018)[a]	Chinese translation of AQ-9	Hong Kong	Cross-sectional	218, 17-51 years (22.4), 67% female	University students	To evaluate the latent profiles of social stigma related to mental illness in the under-researched Chinese context through Factor Mixture Analysis.	"Most of the sample belonged to the low-stigmatizing class, with low to moderate expressions of stigma toward PLMI. The high-stigmatizing class was significantly more likely to be male, not working, and younger and to report significantly higher social distance, personal distress, and empathetic concern."
Arabic (*n*=3)							
Saguem et al. (2021)[a]	Arabic AQ	Tunisia	Measurement properties	310, 18-29 years (22.6), 41.9% female	University students	To translate and validate the AQ in Arabic, by assessing its content validity, construct validity and reliability.	"The Arabic AQ showed acceptable psychometric properties in the assessment of stigma in the Tunisian population. Structural equation models for the responsibility and dangerousness models were mostly supported. The Arabic version of AQ is valid and reliable for the assessment of stigma in Tunisian and Arabic-speaking populations."
Saguem et al. (2022a)	As above	Tunisia	Quasi-experimental (pre/post intervention)	107, 28-31 years, 57% female	Family medicine trainees	To evaluate the effectiveness of a four-session educational intervention for reducing stigma of mental illness targeting family medicine trainees in Tunisia.	"Results showed that the intervention had moderate effects on the AQ-27 total score and on six of its stigma factors."
Saguem et al. (2022b)	As above	Tunisia	Correlational	160, 25-43 years (29.2), 83.1% female	Psychiatry and family medicine trainees	To assess stigmatizing attitudes, affect, and behavioural intentions toward patients with mental illness in mental health trainees and to address the relationship between these stigmatizing factors and empathic abilities.	"Trainees' empathic abilities were independent predictors of anger, pity, help, and segregation. Participants with stronger perspective-taking were more likely to endorse helping, and those with stronger empathic concern reported less anger,

							more pity, more helping intentions, and were less likely to endorse segregation."
				Hebrew (*n*=2)			
Romem et al. 2008)[a]	Hebrew AQ	Israel	Quasi-experimental (pre/post intervention)	136, mean age 26.1 years, 14.7% female	Third year nursing students	To evaluate the degree to which a four-week psychiatric clinical clerkship alters nursing students' attitudes toward individuals with mental illness.	"After the clinical clerkship, students became more compassionate and less frightened by psychiatric patients, were more willing to care for individuals with mental illness and expressed less need to segregate them from the community."
Artzi-Medvedik et al. (2012)	As above	Israel	Cross-sectional	155, mean age 39.6 years, 100% female	Female nurses practicing in psychiatry or obstetrics	To survey the attitudes of nurses in southern Israel about breastfeeding by schizophrenic women.	"70% of nurses held positive attitudes towards breastfeeding among women with schizophrenia."
				French (*n*=1)			
Devoisin-Lagarde et al. (2022)	French translation of brief AQ, Rouyre (2016)	France	Randomised controlled trial	379, mean age 19.9, 79.2% female	Undergraduate psychology students	To compare the effect of three educational interventions on stigma, based on cognitive distortions, biogenetics and early maladaptive schemas.	"The intervention using the early maladaptive schema etiology account for schizophrenia was the only one that led to a significant decrease in stigma. This was driven mainly by an increase in the level of empathic concern toward people with schizophrenia."
				Turkish (*n*=1)			
Akyurek et al. (2019)[a]	Turkish AQ-27	Turkey	Measurement properties	424, mean age 36.9 years, 52.1% female	Hospital visitors	To translate the AQ-27 into Turkish and evaluate the reliability and validity of the new Turkish version on a multi-centred selected adult sample.	"A good internal consistency was obtained, and a statistically significant test–retest reliability was detected. Fit indices of the model supported the factor structure and paths. AQ-27-T was determined as a reliable and valid questionnaire assessing stigmatization toward mental

							illness in Turkish population."
				Sinhalese (*n*=1)			
Baminiwatta et al. (2023)[a]	Sinhalese AQ-9	Sri Lanka	Cross-sectional	405, mean age 39.6 years, 90.6% female	Nurses	To assess whether higher trait mindfulness among Sri Lankan nurses was linked to lower stigma towards psychiatric patients, and whether compassion mediated this relationship.	"Those with higher trait mindfulness were more likely to believe they would help a person with mental illness, and less likely to believe a person with mental illness should be avoided or segregated from the society. Mediation models revealed that compassion partially mediated the effects of trait mindfulness on helping and avoidance."
				Bengali (*n*=1)			
Giasuddin et al. (2015)[a]	26-item Modified Corrigan Attribution Questionnaire (MCAQ)	Bangla-desh	Cross-sectional	200, mean age of first years 18.9, mean age of fifth years 23.4, 59% female	First and fifth-year medical students	To explore stigma among medical students toward persons with mental disorders and their attitudes toward psychiatry.	"Upper medical school year, older age, mother's lower academic level, upper and lower socioeconomic level affiliation and self-consultation for mental or neurological complaints were associated with increased stigma toward PMDs. More favourable attitudes toward psychiatry were found in upper medical school year and were significantly associated with female gender and middle socioeconomic level affiliation."
				Finnish (*n*=1)			
Ihalainen-Tamlander et al. (2016)[a]	Finnish AQ-27	Finland	Cross-sectional	264, mean age 48 years, 98% female	Nurses in primary healthcare	To describe nurses' attitudes towards people with mental illness and examine factors associated with their attitudes in primary care health centres.	"Nurses' attitudes towards people with mental illness in general were positive in primary care health settings. Younger nurses expressed feeling afraid of mentally ill patients. They not only lacked a feeling of safety around these patients but were also often of the opinion that

	people with mental illness should be segregated from the general population.”

Note. All included studies are referenced in a separate reference list in the supplementary material.

[a]Original translation study. [b] Studies reported translating the AQ-27 into ‘Chinese language’ which we recognise is a group of languages, however the variety of Chinese language was not specified. [c]Not a published or publicly available measure. [d]We noticed that Muñoz et al. (2015) and Crespo et al. (2008) report identical sample sizes and sociodemographic data, however it is stated that sampling was carried out between February-June 2012 and April-May 2005, respectively. We contacted Manuel Muñoz regarding the apparent discrepancy and it was confirmed that the samples are identical and they were both obtained in 2005. We have alerted the editors of the American Journal of Orthopsychiatry to the apparent discrepancy.

2) Assessment of the Quality of the Translation and Adaptation Process, Within Original Translation Studies.

a) What Languages has the AQ-27 Been Translated Into, From English?

Part Two of the review focused on a subset of the studies included in Part One, which reported carrying out an original translation of the AQ-27 (i.e., rather than using an existing translation).

Of the 41 studies initially identified, 14 studies produced an original translation. However, two studies[39,40] provided no information about the translation process and were therefore excluded. This left 12 studies remaining for inclusion in Part Two of the review. Table 2 provides an overview of the study characteristics.

Language and Country of Study

The 12 original translation studies spanned nine languages, including Spanish,[39-41] Chinese languages,[42,43] and Italian,[44] Arabic,[45] Hebrew,[46] Turkish,[47] Sinhalese,[48] Bengali,[49] and Finnish[50]. The Spanish AQ-27,[39] had the highest number of citing papers within the current systematic review (*n*=7 citations), followed by the Italian AQ-27,[44] (*n*=4), Arabic AQ,[45] (*n*=2), Chinese AQ[44] (*n*=1) and Hebrew AQ-27,[45] (*n*=1). This suggests that the Spanish, Italian and Arabic versions of the AQ-27 are gaining traction.

Studies took place across Asia (Taiwan,[42] China,[43] Israel,[46] Turkey,[47] Sri Lanka,[48] Bangladesh[49]), Europe (Spain,[39,41] Italy,[44] Finland[50]), Africa (Tunisia[45]) and South America (Colombia[40]).

Participant Characteristics

Across the studies, 3,004 participants were recruited. Sample sizes ranged from 123,[42] to 439,[39]. Studies sampled university students[42,43,45,46] (*n*=5), the public[39-41,44,47] (*n*=5) and

nurses[48,50] (*n*=2). Most studies (*n*=9, 75%) contained predominantly female samples (≥ 50%). The mean age of participants ranged from 18.9 years,[49] to 48 years.[50]

Study Designs

A range of study designs were identified. Four studies (33.3%) had a primary aim of translating and psychometrically evaluating the AQ-27: those were the Spanish AQ-27,[39] Italian AQ-27,[44] Arabic AQ[45] and Turkish AQ-27.[47] The remaining studies consisted of cross-sectional designs[40-43,48-50] (*n*=7), and pre/post intervention designs (*n*=1).[46]

Table 2.

Overview of Study Characteristics (Part Two)

Authors (year)	Version of AQ; number of citing papers in the current review	Country	Study design	Sample size, age range (mean), % female	Participant occupation	Aims	Main findings
				Spanish (*n*=3)			
Muñoz et al. (2015)	Spanish AQ-27, AQ-27-E	Spain	Measurement properties	439, mean age 39 years, 52.6% female	Residents in Madrid	To translate and analyse the psychometric properties of the Attribution Questionnaire for use in Spanish-speaking populations (AQ-27-E), and to test the dangerousness and responsibility models of mental illness stigma in a Spanish sample.	"The AQ-27-E has acceptable psychometric properties comparable to previous versions, which can be used to assess stigma in Spanish-speaking populations."
Chamorro Coneo et al. (2022)	Colombian-Spanish adaptation of the AQ-27	Colombia	Cross-sectional	271, 18-79 years (32), mean age 32 years, 67.4% female	Community sample	To examine pathogen-disgust sensitivity and danger appraisal mechanisms in responses of stigma towards SMI.	"Pathogen avoidance and danger appraisal systems interplay in the generation of discriminatory behaviour towards SMI."
Crespo et al. (2008)	Spanish AQ-27	Spain	Cross-sectional	439, mean age 39 years, 52.6% female	Community sample from Madrid	To analyse the stigma associated with severe and persistent mental illness in the general population of Madrid.	"Most of the participants showed a helping attitude toward the mentally ill persons, and especially, a disposition to coerce them into treatment."
				Chinese (n=*2*)			
Chiu et al. (2021)	Modified Chinese AQ	Taiwan	Cross-sectional	123, mean age 21.7 years, 41.5% female	Medical students	To compare the differences of public stigma, self-stigma, and social distance associated with schizophrenia between old and new name of schizophrenia in Taiwanese medical students.	"After renaming schizophrenia, we noted significant differences in the scores in the modified AQ, the perceived psychiatric stigma scale, and the modified social distance scale in all participants

							and the fourth-year students, respectively."
Ho et al. (2018)	Chinese translation of AQ-9	Hong Kong	Cross-sectional	218, 17-51 years (22.4), 67% female	University students	To evaluate the latent profiles of social stigma related to mental illness in the under-researched Chinese context through Factor Mixture Analysis.	"Most of the sample belonged to the low-stigmatizing class, with low to moderate expressions of stigma toward PLMI. The high-stigmatizing class was significantly more likely to be male, not working, and younger and to report significantly higher social distance, personal distress, and empathetic concern."
				Italian (*n*=1)			
Pingani et al. (2012)	Italian AQ-27, AQ-27-I	Italy	Measurement properties	214, 18-89 years (40.2), 52.3% female	Relatives of university students	To translate the Attribution Questionnaire-27 (AQ-27) to the Italian language (AQ-27-I), and to examine the reliability and validity of this new Italian version.	"The AQ-27-I demonstrated acceptable internal consistency. Test–retest reliability was also satisfactory. Fit indices of the model supported the factor structure and paths. The AQ-27-I is a reliable measure to assess stigmatizing attitudes in Italian."
				Arabic (*n*=1)			
Saguem et al. (2021)	Arabic AQ-27	Tunisia	Measurement properties	310, 18-29 years (22.6), 41.9% female	University students	To translate and validate the AQ in Arabic, by assessing its content validity, construct validity and reliability.	"The Arabic AQ showed acceptable psychometric properties in the assessment of stigma in the Tunisian population. Structural equation models for the responsibility and dangerousness models were mostly supported. The Arabic version of AQ is valid and reliable for the assessment of stigma in Tunisian and Arabic-speaking populations."

				Hebrew (*n*=1)			
Romem et al. 2008)	Hebrew AQ	Israel	Quasi-experimental (pre/post intervention)	136, mean age 26.1 years, 14.7% female	Third year nursing students	To evaluate the degree to which a four-week psychiatric clinical clerkship alters nursing students' attitudes toward individuals with mental illness.	"After the clinical clerkship, students became more compassionate and less frightened by psychiatric patients, were more willing to care for individuals with mental illness and expressed less need to segregate them from the community."
				Turkish (*n*=1)			
Akyurek et al. (2019)	Turkish AQ-27	Turkey	Measurement properties	424, mean age 36.9 years, 52.1% female	Hospital visitors	To translate the AQ-27 into Turkish and evaluate the reliability and validity of the new Turkish version on a multi-centred selected adult sample.	"A good internal consistency was obtained, and a statistically significant test–retest reliability was detected. Fit indices of the model supported the factor structure and paths. AQ-27-T was determined as a reliable and valid questionnaire assessing stigmatization toward mental illness in Turkish population."
				Sinhalese (*n*=1)			
Baminiwatta et al. (2023)	Sinhalese AQ-9	Sri Lanka	Cross-sectional	405, mean age 39.6 years, 90.6% female	Nurses	To assess whether higher trait mindfulness among Sri Lankan nurses was linked to lower stigma towards psychiatric patients, and whether compassion mediated this relationship.	"Those with higher trait mindfulness were more likely to believe they would help a person with mental illness, and less likely to believe a person with mental illness should be avoided or segregated from the society. Compassion partially mediated the effects of trait mindfulness on helping and avoidance."

Bengali (*n*=1)							
Giasuddin et al. (2015)	26-item Modified Corrigan Attribution Questionnaire (MCAQ)	Bangla-desh	Cross-sectional	200, mean age of first years 18.9, mean age of fifth years 23.4, 59% female	First and fifth-year medical students	To explore stigma among medical students toward persons with mental disorders and their attitudes toward psychiatry.	"Upper medical school year, older age, mother's lower academic level, upper and lower socioeconomic level affiliation and self-consultation for mental or neurological complaints were associated with increased stigma toward PMDs. More favourable attitudes toward psychiatry were found in upper medical school year and were significantly associated with female gender and middle socioeconomic level affiliation."
Finnish (*n*=1)							
Ihalainen-Tamlander et al. (2016)	Finnish AQ-27	Finland	Cross-sectional	264, mean age 48 years, 98% female	Nurses in primary healthcare	To describe nurses' attitudes towards people with mental illness and examine factors associated with their attitudes in primary care health centres.	"Nurses' attitudes towards people with mental illness in general were positive in primary care health settings. Younger nurses expressed feeling afraid of mentally ill patients. They not only lacked a feeling of safety around these patients but were also often of the opinion that people with mental illness should be segregated from the general population."

b) What is the Quality of the Procedures Used to Translate and Adapt the AQ-27?

Quality Assessment

Selected items from the COSMIN Study Design Checklist (Appendix C) were used to assess the quality of the methodological approach to translation. This informed Research Question 2(b). Full results from the quality appraisal are presented in Appendix D. Table 2 provides an overview of the findings.

Overall quality ratings varied considerably, ranging from 25,[42] to 54,[47] out of a maximum of 60. The Turkish AQ-27,[47] was the highest rated translation. The Italian AQ-27,[44] and Arabic AQ[45] also scored highly (48 and 44, respectively). All these studies were primarily focused on translation and psychometric evaluation of the AQ-27. By contrast, two thirds of the included studies (*n*=8) were not focused on translation and provided relatively limited detail on the translation method.

The process by which the Turkish AQ-27,[47] was culturally adapted is explicitly outlined in detail. Authors referenced standardised, widely cited guidelines[20] which address both linguistic and cultural considerations. Authors describe a sequential process, including completing multiple forward and backward translations, consulting with an expert committee and completing pilot testing with follow-up interviews. These processes aim to maximise equivalence between the original measure and the translated version, in order that data are comparable cross-culturally.[20]

Regarding strengths and limitations of the translation methodology, the quality appraisal highlighted some key themes. Most studies (*n*=10, 83.3%) reported completing at least one forward and one backward translation. This is a well-known approach to questionnaire translation.[19] Four studies[44,45,47,50] (33.3%) completed multiple forward-backward translations. This is recommended to enable any discrepancies to be compared and resolved.[20] Most studies did not report on the expertise and background of the translators,[11]

such as their first language and knowledge of stigma, which is a limitation. Furthermore, three studies did not use professional translators[41,43]. This included the Spanish AQ-27,[39] which was the most widely cited translation within the current review. Questionnaire translation is a complex process, requiring a combination of linguistic, cultural and subject matter expertise,[51] and an 'ad hoc' approach to translation could potentially compromise data quality.[19]

Over half of the studies (*n*=7, 58.3%) did not involve an expert committee in the translation process. The expert committee is a multidisciplinary group with expertise in the construct being measured (ideally including the original questionnaire developers), whose role is to consolidate all versions of the questionnaire and develop the 'prefinal' version for pilot testing.[20] This step has been described as 'crucial' to establishing cross-cultural equivalence and involves a collaborative, 'team-based' approach to assessing linguistic and cultural factors which may affect translation.[19] Considering the AQ-27, stigma is arguably strongly influenced by culture and this may be important to consider alongside linguistic aspects of translation.[3,52]

A final limitation was that half of the studies (*n*=6, 50%) did not pilot test the translated measure in the target culture. Pilot testing aims to test respondents' understanding of the meaning of questionnaire items, to ensure that the translation retains equivalence within the target cultural context.[11]

Table 3.

Overview of the Quality of Translation Processes.

Authors (year)	Name of measure	Country	Translators	Forward-backward translation	Expertise, and mother tongue of translators [b]	Independent translation	Translation is reviewed by a committee	Pilot testing to check the comprehensibility of the instructions, items and response options	Overall quality rating (max = 60) and ranking based on score
					Spanish (*n*=3)				
Muñoz et al. (2015)[a]	Spanish AQ-27 (AQ-27-E)	Spain	Study authors.	Yes – one forward translation and one backward translation.	Not reported.	Unclear whether translators worked independently.	No expert committee review.	Yes - "A pilot study was performed with general population (N=20) to study the behavior of the items, their comprehension, and adequacy."	38, 5th
Chamorro-Coneo et al. (2022)	Colombian -Spanish adaptation of AQ-27	Colombia	Two professional translators.	Yes – one forward translation and one backward translation.	Not reported.	Assumable that translators worked independently.	No expert committee review.	Yes – "The Colombian-Spanish AQ was pilot tested (N = 21) with the other variables of this study. Results showed good comprehension of the items amongst participants and adequate distribution of the scales' scores."	35, 6th
Crespo et al. (2008)	Spanish AQ-27	Spain	Study authors.	Yes – one forward translation and one backward translation.	Not reported.	Translators were not independent.	No expert committee review.	No pilot testing.	30, 10th

Chinese (*n*=2)									
Chiu et al. (2021)	Modified Chinese AQ	Taiwan	Not reported.	No –forward translation only.	Not reported.	Not reported.	No expert committee review.	No pilot testing.	25, 11th
Ho et al. (2018)	Chinese AQ-9	Hong Kong	Study authors.	Yes – one forward translation and one backward translation.	Not reported.	Translators were not independent.	Yes – the Chinese AQ-9 was reviewed by the original authors of the AQ-27.	No pilot testing.	33, 8th
Italian (*n*=1)									
Pingani et al. (2012)[a]	Italian AQ-27 (AQ-27-I)	Italy	Three native Italian speakers (forward), one professional translator (backward).	Yes – multiple forward translations and one backward translation.	Forward translators were native Italian speakers, as per guidelines. Backward translators: expertise and mother tongue not described.	Translators worked independently.	No expert committee review.	Yes – "The draft Italian version was tested on 30 Italian-speaking students. A group discussion followed, with students required to answer two questions for each item: "What does this statement mean to you?" and "Is there any other wording that enables this meaning to be expressed more clearly?"	48, 2nd
Arabic (*n*=1)									
Saguem et al. (2021)[a]	Arabic AQ	Tunisia	Four professional translators.	Yes – multiple forward and multiple backward translations.	Forward translators: expertise and mother tongue not described. Backward translators: both had no knowledge of the original AQ-27, as per guidelines.	Translators worked independently.	Yes - sixteen experts (adult and child psychiatrists) were asked to judge the clarity, the relevance, the discernment of each item and response validity.	"The Arabic version was tested on 101 medical students. They were asked to comment on each item of the instrument and to mention any other wording that enables its meaning to be	44, 3rd

					Mother tongue unknown.			expressed more clearly."	
Hebrew (*n*=1)									
Romem et al. (2008)	Hebrew AQ	Israel	"Three independent judges"	No – forward translation only.	Not reported.	Translators worked independently.	No expert committee review.	No pilot testing.	32, 9th
Turkish (*n*=1)									
Akyurek et al. (2019)[a]	Turkish AQ-27	Turkey	Four professional translators, and two native English speakers	Yes – multiple forward translations and multiple backward translations.	Forward: two translators with a medical background and two without a medical background, as per guidelines. Backward: two native English speakers who had no medical background, as per guidelines.	Translators worked independently	Yes – "an expert committee examined all translations, reports and the original version of the survey and developed the penultimate pilot version."	First pre-test: "30 participants completed the Turkish AQ-27 to determine whether the measure was intelligible and appropriate for Turkish culture. Participants were interviewed individually about the lucidity of the items, the accuracy of the reflection of general stigma in the survey, and the usefulness and length of the survey." Second pre-test: "Following cultural adaptations and changes to wording, the Turkish AQ-27 was administered to 52 participants."	54, 1st
Sinhalese (*n*=1)									
Baminiwatta et al. (2023)	Sinhalese AQ-9	Sri Lanka	"Bilingual experts"	Yes – one forward and	Not reported.	Unclear whether translators	Yes – "revisions by an expert panel".	No pilot testing	34, 7th

				one backward translation.		worked independently.			
Bengali (*n*=1)									
Giasuddin et al. (2015)	Bengali 26-item Modified Corrigan Attribution Questionnaire (MCAQ)	Bangla-desh	"Expert translators"	Yes – multiple forward and multiple backward translations.	Not reported.	Assumable that translators worked independently.	No expert committee review.	No pilot testing	35, 6th
Finnish (*n*=1)									
Ihalainen-Tamlander et al. (2016)	Finnish AQ-27	Finland	Study authors and one professional translator.	Yes – multiple forward and multiple backward translations.	Not reported.	Translators worked independently.	Yes – "the developer of the questionnaire inspected whether the translated version of the instrument corresponded with the original instrument."	"The Finnish instrument was pilot tested in two psychiatric wards with 20 volunteer nurses (not participating in the main study) to find out the clarity and understandability of the items, effectiveness of instructions and time required to complete the questionnaire."	43, 4th

Note. Colour coding reflects scoring from the quality assessment, using the adapted COSMIN Study Design Checklist (0-4). Dark green=4 (very good), light green=3 (adequate), light orange=2 (doubtful), dark orange=1 (inadequate), grey=0 (not reported).

[a]Studies with a primary aim of translating and analysing the psychometric properties of the AQ-27.

c) What is Known About the Reliability and Validity of Translated Versions of the AQ-27?

Data were extracted relating to the reliability and validity of the translated measures, where provided. Results are shown in Table 4.

Reliability

i) Internal Consistency

Internal consistency reflects the extent to which items in a questionnaire, or its subscales are correlated and therefore measure the same construct.[30] Cronbach's alpha (α, expressed as a number between 0 and 1) is a commonly used measure of internal consistency.[53] A higher alpha indicates that items are more strongly correlated with each other, while a low alpha indicates a weaker correlation. Alpha values of between 0.7 and 0.95 can be considered indicative of good internal consistency.[30]

Eight studies (66.7%) reported on internal consistency for the AQ-27 as a whole. All reported values were above the threshold for acceptability. Five studies (41.7%; the Spanish,[39] Italian[44] and Hebrew[46] translations) reported on subscale alpha values. Interestingly, across several studies low alpha values were reported for the Responsibility (α=0.39 - 0.615),[39,46] Pity (α=0.494 - 0.676),[39,40,44] and Anger subscales (α=0.521 - 0.577).[39,44] This could potentially be due to a poor correlation between items, which may indicate that some items need to be revised or removed. This could be explored by measuring the extent to which subscale items correlate with each other, and with the total score.[53]

Internal consistency was not assessed for the Finnish AQ-27,[50] or Sinhalese AQ-9.[48]

ii) Test-Retest Reliability

Test-retest reliability refers to the degree to which repeated measurements with the same participants under the same conditions produces consistent results.[30] The Intraclass Correlation (ICC) is a widely used measure of test-retest reliability.[54] Values range from 0 to 1, with values closer to 1 indicating stronger reliability.

Only two studies[44,47] (16.7%) reported on test-reliability. For the Italian AQ-27,[44] both total and subscale ICCs were provided. The total ICC (0.72) was within the range for moderate reliability[54] (0.5-0.75). Subscale ICC values ranged from 0.51 (moderate) for Anger, to 0.89 for Fear (approaching excellent reliability). For the Turkish AQ-27,[47] both total and item Pearson correlation coefficients were provided as a measure of test-retest reliability. The total Pearson correlation coefficient (0.793) suggests that the Turkish AQ-27 had adequate test-retest reliability.[55]

Validity

i) Factor Structure (Structural Validity)

Factor analysis explores the relationship between questionnaire items, and underlying dimensions of the measured construct which may explain these relationships.[56] The two main types of factor analysis are Confirmatory Factor Analyses (CFA) and Exploratory Factor Analysis (EFA).

Most studies (*n*=8, 66.7%) did not carry out a factor analysis. CFA was carried out for the Italian[44] and Turkish AQ-27.[47] In both cases, results supported the original nine-factor structure of the AQ-27. EFA was carried out for the 20-item, Modified Chinese AQ,[42] resulting in a six-factor solution. The Arabic AQ[45] was derived by translating an existing 21-item version of the AQ and consists of a seven-factor structure. The 21-item measure

excluded the Segregation (items 6, 15 and 17) and Coercion subscales (items 5, 14 and 25), due to a lack of support for these subscales in previous translated versions.[41]

Table 4.

Reliability and Validity of Translated Versions of the AQ-27.

Authors (year)	Name of measure, location	Participant occupation, sample size, age range (mean), % female	Modifications to items	Modifications to vignette	Changes to factor structure, factor analysis (e.g. CFA, EFA)	Internal consistency (Cronbach's alpha)	Test-retest reliability (e.g. intraclass correlation coefficient)
				Spanish (*n*=3)			
Muñoz et al. (2015)[a]	Spanish AQ-27, AQ-27-E, Spain	Residents in Madrid; 439, mean age 39.01 years, 52.6% female	No changes- retained 27-item AQ.	No changes – "AQ-27 includes a neutral vignette that represents a hypothetical person (Harry) who suffers from a severe mental illness."	No changes - retained the original nine factor structure. No factor analysis.	Total= .855 Fear = .896; Anger = .577 Help = .766; Dangerousness = .849; Avoidance = .730; Segregation = .848; Pity = .494; Responsibility = .390; Coercion = .478	Not reported.
Chamorro Coneo et al. (2022)	Colombian -Spanish adaptation of AQ-27, Colombia	Community sample; 271, 18-79 years (32), mean age 32 years, 67.37% female	Reduced the number of items to 20.	No changes – "The AQ-27 in Colombian Spanish comprised four vignettes describing the story of "Juan", a man with a SMI. The story in each vignette was different regarding Juan's aggressiveness and causes associated with the cause and exacerbation of his symptoms."	Factor structure unclear. No factor analysis.	Total alpha not reported. Anger = .81; Fear = .96; Helping/avoidance = .84; Coerion/segregation = .86; Responsibility = .60; Pity = .55	Not reported.
Crespo et al. (2008)[a]	Spanish AQ-27, Spain	Community sample; 439, mean age 39.01 years, 52.6% female	No changes- retained 27-item AQ.	No changes – used neutral version of the vignette.	No changes - retained the original nine factor structure. No factor analysis.	Total = 0.76 Subscale alphas not reported	Not reported.

				Chinese (*n*=2)			
Chiu et al. (2021)	Modified Chinese AQ (20 items), Taiwan	Medical students; 123, mean age 21.7 years, 41.5% female	"Due to the similarity after translation into Chinese, we extracted 20 items of the Corrigan's attribution questionnaire according to experts' opinions for this study".	Modified the vignette to compare the old and new name of schizophrenia in Taiwan ("disorder with dysfunction in thought and perception").	Items were grouped into nine subscales. Exploratory factor analysis yielded a six-factor solution.	Total (old name)= .83 Total (new name) = .82 Subscale alphas not reported	Not reported.
Ho et al. (2018)	Chinese AQ-9, Hong Kong	University students; 218, 17-51 years (22.4), 67% female	No changes - retained 9-item AQ.	No changes – "John is a single man who lives alone in an apartment and works as a clerk at a large law firm. He was diagnosed with schizophrenia. He often hears voices of unknown origin and becomes upset. He has been hospitalized for two months because of his illness".	"Preliminary factor mixture analysis supported a one-factor structure for the scale."	Total = .80 Subscale alphas not reported	Not reported.
				Italian (*n*=1)			
Pingani et al. (2012) [a]	Italian AQ-27 (AQ-27-I), Italy	Relatives of university students; 214, 18-89 years (40.15), 52.3% female	No changes- retained 27-item AQ.	No changes – "the vignette described 'Harry', a 30-year-old single man with schizophrenia".	Confirmatory factor analysis (CFA) "Our major goal was to determine whether the Italian model mirrored the American; fit indicators were equivalent on the matter".	Total=0.818 Responsibility = .615; Pity = .676; Anger = .521 Dangerousness = .755 Fear = .912; Help = .814 Coercion = .570; Segregation = .801; Avoidance = .570	Total intraclass coefficient (test-retest reliability) = 0.72 Subscale ICCs ranged from 0.51 (Anger) to 0.89 (Fear)
				Arabic (*n*=1)			
Saguem et al. (2021)[a]	Arabic AQ, Tunisia	University students; 310, 18-29 years (22.6), 41.9% female	Translated a 21-item version of the AQ.	No changes reported – "The questionnaire starts with a short statement about "Harry," a 30-year-old single man who works as a clerk in a law firm and who has	Describe a seven-factor model; Responsibility, Pity, Help, Avoidance, Dangerousness, Fear, Anger.	Total = .71 Responsibility = .78 Pity = .82; Help = .72 Avoidance = .72 Dangerousness = .78	Not reported.

				been hospitalized for schizophrenia."	No factor analysis.	Danger = .73; Fear = .74	
				Hebrew (*n*=1)			
Romem et al. (2008)	Hebrew AQ, Israel	Third year nursing students; 136, mean age 26.1 years, 14.7% female	"One statement was excluded due to difficulties retaining the original meaning following translation into Hebrew. Six constructs, with 3 to 4 items each were used."	No changes – "the final questionnaire included vignettes about four 30-year-old men with schizophrenia, which vary in the level of danger and controllability attributed to the patient".	Six constructs, with 3-4 items each; Responsibility, Pity, Anger, Fear, Willingness to Help, Segregation. No factor analysis.	Total alpha not reported. Subscales (pre/post intervention): Responsibility .55, .86 Pity = .87, .83; Anger = .87, .83; Fear = .87, .82; Willingness to Help = .78, .80; Segregation = .84, .87	Not reported.
				Turkish (*n*=1)			
Akyurek et al. (2019)[a]	Turkish AQ-27, Turkey	Hospital visitors; 424, mean age 36.9 years, 52.1% female	"The wording of items 4, 11, 12, 13, 14, 17, 19, 20, 22, 24, 27 were amended to preserve the original meaning, as part of the cultural adaptation process."	No changes– "Hasan is a 30-year-old single man with schizophrenia. Sometimes he hears voices and becomes upset. He lives alone in an apartment and works as a clerk at a large law firm. He had been hospitalized six times because of his illness."	CFA indicated that the original nine factor structure was supported.	Total = .88 Individual items ranged from .866 to .892	Pearson correlation coefficient (for total score)=0.793 Item correlation coefficients ranged from 0.35-0.77
				Sinhalese (*n*=1)			
Baminiwatta et al. (2023)	Sinhalese AQ-9, Sri Lanka	Nurses; 405, mean age 39.6 years, 90.6% female	No changes - retained 9-item AQ.	No changes – "hypothetical vignette about a man named Harry who has schizophrenia".	N/A – "each domain in the AQ-9 was measured by only a single item".	N/A – "each domain in the AQ-9 was measured by only a single item".	Not reported.
				Bengali (*n*=1)			
Giasuddin et al. (2015)	Bengali 26-item Modified	First and fifth-year medical students; 200, mean age of first years 18.9,	"One question from the original questionnaire was deleted: 'If I were in charge of the treatment	No changes– "The MCAQ provides a brief vignette about Hasib, a 30-year-old single man with schizophrenia who lives	No factor analysis.	Total = 0.71	Not reported.

	Corrigan Attribution Questionnaire (MCAQ), Bangla-desh	mean age of fifth years 23.4, 59% female	of Hasib, I would force him to live in a group home', since this service option is unavailable in the country".	alone and works as a clerk at a large private firm. He had been hospitalized six times because of his illness."			
				Finnish (*n*=1)			
Ihalainen-Tamlander et al. (2016)	Finnish AQ-27, Finland	Nurses; 264, mean age 48 years, 98% female	No changes- retained 27-item AQ.	No changes – "Harry is a 30-year-old single man with schizophrenia. Sometimes he hears voices and becomes upset. He lives alone in an apartment and works as a clerk at a large law firm. He has been hospitalized six times because of his illness".	No changes - retained the original nine factor structure. No factor analysis.	Cronbach's alpha not reported.	Not reported.

[a] Studies with a primary aim of translating and validating the AQ-27.

Discussion

Since its inception in 2003, the AQ-27 has become a well-established measure of public mental illness stigma. This was the first systematic review to explore the use of translated (non-English language) versions of the AQ-27 to measure stigma towards people with schizophrenia. The methodological quality of the translation processes was assessed using COSMIN criteria,[27] and psychometric data were reviewed.

The current review identified that to date, the AQ-27 has been translated into eleven languages and implemented across fifteen countries. This suggests that the AQ-27 is gaining traction internationally as a tool for measuring stigma. Regarding geographical distribution, Western Europe was over-represented in the review. Most studies (63.4%) took place in Europe, with the largest samples being obtained from Spain, Portugal and Italy. A smaller proportion of studies took place in Asia (22%), Africa (7.3%) and South America (7.3%). Similar findings were reported in a previous review (1990-2012) by Yang et al.[12] Therefore, the current review adds to existing literature which suggests that stigma research is somewhat skewed towards 'WEIRD' countries and populations, while large parts of the world are under-researched.

While there was a relatively large number of studies adopting translated versions of the AQ-27, there was considerable heterogeneity in the designs and aims of the included studies. A small subset (*n*=4, 33%) of the twelve studies carrying out an original translation of the AQ-27 were primarily focused on translation and validation of the measure.[39,44,45,47] This was reflected in the rigour and quality of the translation methodology. Indeed, while the Spanish AQ-27,[39] had the highest number of citations within the review (34.1% of included studies were based in Spain), the Turkish[47], Arabic[45] and Italian[44] versions were rated highest in terms of the quality of the translation processes. Of note, Akyurek et al.[47] provide a particularly thorough account of the cultural adaptation process used to develop the Turkish

AQ-27, in accordance with Beaton et al.'s[20] cross-cultural adaptation guidelines. There is evidence to suggest that a rigorous, multistep approach to translation results in better outcomes with regards to the cross-cultural equivalence and validity of translated measures.[21] It is acknowledged, however that these approaches involve a greater investment of time, resource and money.[19]

Several studies appeared to adopt a relatively simple forward-backward translation approach, without committee involvement. It has been argued that forward-backward translation should not be relied upon exclusively as a means of producing an equivalent translation, since this may overemphasise linguistic equivalence while neglecting to account for cultural variation and idiosyncrasies.[51] Consensus within the field is that forward-backward translation should be combined with a committee or team-based approach.[19] As stated by Behr[51]:

> A methods description along the lines of 'We translated and back translated the questionnaire to check for equivalence,' which is all too common, should not be regarded as sufficient evidence of a flawless and equivalent translation. Efforts should be directed towards ensuring quality in the translation itself – by committee or team approaches; by the involvement of suitable translation, content, and survey experts; and by thorough documentation of the translation process, including problems and intentional deviations from a source questionnaire. (Behr, 2017, p. 582)

This is reflected within translation guidelines[11,20] and quality criteria[27] which recommend that translations are reviewed by an expert committee and then pilot tested within the target cultural context. Within the current review, over half of the included studies (58.3%) did not involve an expert committee and half did not carry out pilot testing.

Furthermore, four studies did not use professional translators. This may have implications for the quality of the data obtained using translated measures.[19,51]

There were some gaps in reporting across the studies, for example regarding the profiles and expertise of the translators. Most studies did not refer to any standardised translation protocol. Questionnaire translation guidelines[11,20] emphasise the importance of fully documenting each step of the translation process, to enable the quality of the translation approach to be evaluated.

Following translation of a measure, it is important to assess its psychometric properties, since it cannot be assumed that these properties will be retained.[12,20] Within the current review, the most commonly reported metric was internal consistency (Cronbach's alpha). However, there were some clear gaps in the assessment of psychometric properties. Only four studies carried out a factor analysis, and only two studies reported on test-retest reliability.

For pragmatic reasons, non-English publications were excluded from the systematic review. This could potentially have excluded some relevant publications; however, the potential relevance of the excluded articles was difficult to verify due to the limited access. The six excluded publications were all located in Western Europe, which as discussed, was already over-represented in the review relative to other parts of the world. There is some evidence to suggest that excluding non-English papers from systematic reviews may have a minimal impact as most scientific papers are published in the English language.[57] Indeed, despite excluding non-English publications, we obtained a relatively large number of papers citing translated versions of the AQ-27.

Conclusions

This systematic review provides an overview of the use of translated versions of the AQ-27, and an assessment of the methodological quality of the translation approaches. Some relatively robust translation approaches were identified (e.g., for the Turkish[47], Arabic[45] and Italian[44] adaptations). In some cases, multiple translations had been produced for the same language (e.g., Spanish and Chinese). Therefore, this review may help future researchers to avoid unnecessary duplication of work, where high-quality translations are already available. Researchers are advised to consider the quality of the original translation methodology used to develop existing measures before adopting them, as this may have important implications for data quality. A poor-quality translation could potentially invalidate conclusions drawn from the data.[19]

In future, researchers wishing to develop their own translations of the AQ-27 should be aware that a systematic and rigorous approach, based on a robust translation framework and ideally involving a committee approach is recommended to ensure that the translated measure is valid and equivalent within the target culture.[19] A variety of translation frameworks and quality appraisal tools are available to support this.[19,20,27]

Stigma is arguably a social and cultural construction.[3,58] When considering the cross-cultural adaption of existing stigma measures, it is important to note that many tools, including the AQ-27 were originally developed and evaluated within Western, English-speaking cultural contexts, such as the UK, USA and Australia.[12] It is likely that this will inform the way in which mental health is conceptualised and represented.[13] A report by the Lancet Commission[5] highlighted concerns that within the field of global mental health, Western, biomedical models of mental health are being extrapolated to define health, illness and treatment across diverse cultural contexts where a variety of different perspectives may

be held.[58] An alternative approach to stigma measurement could be to develop culturally specific stigma measures. Yang et al.[12] propose a 'what matters most' framework to guide the development of culture-specific measures, which focuses on attempting to understand how stigma threatens the activities that define personhood within the local cultural context. This approach may be better able to capture culture-specific stigma dynamics.

Ethical considerations: All analyses were based on previously published studies, therefore no ethical approval or patient consent is required.

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Chapter Three: Bridging Chapter

The purpose of this chapter is to provide an overview of how the systematic review and empirical paper are related. The systematic review identified that the Attribution Questionnaire (AQ-27) has been translated and adapted for use across a variety of countries and languages to measure public mental illness stigma. Considering the quality of existing translations, the review highlighted the importance of adopting a rigorous and systematic approach to translation, based on a standardised translation framework to establish the validity and equivalence of the measure within the target cultural context (Valdez et al., 2021).

The empirical paper presented in the following chapter used the social media platform, Twitter to investigate public attitudes towards schizophrenia and psychosis. Mental health is frequently discussed on Twitter (Berry et al., 2017) and this presents an opportunity to study stigma and public discourse around mental health in a more naturalistic manner, compared to traditional questionnaire-based methods which may be impacted by social desirability bias (Rasinski et al., 2005). Indeed, there is an emerging body of research which has content analysed Twitter posts to explore attitudes towards a range of mental health problems (Robinson et al., 2019; Passarello et al., 2019; Joseph et al., 2015; Reavley & Pilkington, 2014; Alvarez-Mon et al., 2019). Chapter Four, therefore presents the empirical paper which used quantitative content analysis to compare attitudes in Tweets using the terms schizophrenia and psychosis, in their noun and adjective forms. This was a replication and extension of previous work by Passarello et al. (2019). The empirical paper is followed by an overall discussion and critical evaluation of the thesis as a whole.

Chapter Four: Empirical Paper

Using Twitter[1] to Compare Attitudes Towards Schizophrenia and Psychosis: Investigating the Prevalence of Stigma.

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Author Note

The first author would like to thank Lucy McEntegart (LM) for her help with inter-rater reliability coding of Tweets.

[1] This project was conducted using the social media platform formerly known as Twitter. We will refer to it as Twitter as this was its name at the time of carrying out the research, however we are aware that the platform was renamed 'X' in July 2023.

Abstract

Purpose: Schizophrenia remains one of the most stigmatised psychiatric diagnoses. It has been argued that the condition requires renaming. Psychosis is often used as an alternative term in UK clinical practice. We explored the prevalence of stigmatising attitudes towards schizophrenia and psychosis using Twitter.

Methods: Quantitative content analysis was used to analyse Tweets (*n*=423) containing the terms 'psychosis', 'psychotic', 'schizophrenia' or 'schizophrenic'. Tweets were categorised according to the presence and type of stigma.

Results: Both schizophrenia and psychosis were frequently stigmatised on Twitter. However, Tweets using the terms psychosis/tic were significantly more likely to contain stigmatising attitudes (70.9%, *n*=151) than Tweets using the terms schizophrenia/c (42.4%, *n*=89; p<.001). Adjective terms were significantly more commonly stigmatised (76.6%, *n*=164) than nouns (36.4%, *n*=76; p<.001). The term 'psychotic' was frequently used pejoratively.

Conclusion: Both 'schizophrenia' and 'psychosis' are associated with high levels of stigma on Twitter. If schizophrenia is to be renamed, psychosis may not be a suitable replacement.

Keywords: stigma, psychosis, schizophrenia, Twitter, social media

Introduction

Of all diagnostic terms, 'schizophrenia' is arguably one of the most stigmatised [1, 2]. Link and Phelan's [3] widely cited sociological definition conceptualises stigma as consisting of several interacting components; labelling, stereotyping, separation, status loss and discrimination (the behavioural component of stigma). Stigma can be broadly differentiated into public stigma (attitudes, beliefs and behaviour of the general public) and internalised stigma (the way in which this is experienced by the stigmatised individual) [4].

Large-scale attitudes surveys suggests that in the UK, schizophrenia is commonly associated with public perceptions of dangerousness, unpredictability and a poor prognosis [5, 4]. Media coverage of schizophrenia is frequently negative, including representations linking schizophrenia and the perpetration of violence [6, 7] and this contributes to negative, inaccurate public perceptions of the condition. People diagnosed with schizophrenia may internalise negative stereotypes, leading to disempowerment and a negative self-concept [8]. Furthermore, well-intentioned public awareness campaigns which emphasise biogenetic causal explanations for mental health have been associated with increased public prejudice, fear and desire for social distance [9].

Importantly, negative public perceptions of mental illness are associated with prejudice and discrimination [10]. This may impact on personal relationships and reduce access to life opportunities, such as jobs and housing [11, 12, 13]. The World Health Organisation [14] has identified the reduction of stigma, discrimination, and human rights abuses towards people with mental health difficulties as a global priority.

The Schizophrenia Label

Labelling theory [15, 16] suggests that the diagnostic language used to describe mental distress may contribute to stigma. Indeed, for decades, schizophrenia has been a

contested term [17]. Various criticisms have been put forward, including that the word (literally translating as 'split-mind' disease) does not accurately represent the condition it intends to describe [18]. Whilst other mental health conditions have undergone name changes in relation to issues of stigmatisation, such as 'manic depression' which was formally renamed to 'bipolar disorder' in the 1980s [19], the term schizophrenia has remained part of the diagnostic lexicon since it was first coined by Bleuler in 1908 [20]. These issues are highlighted in a review by the Schizophrenia Commission [21], "Psychiatrists must be extremely cautious in making a diagnosis of schizophrenia as it can generate stigma and unwarranted pessimism. The more general term 'psychosis' is preferable, at least in the early stages." (Schizophrenia Commission, 2012, p.7). Practice guidance from the British Psychological Society [22] also suggests that the broader term 'psychosis' may be used to describe key elements of the presentation.

Beyond the issue of language, the validity of the schizophrenia construct (i.e., as a distinct, categorical entity) has been questioned [23, 24, 17]. Van Os [25] advocates for a psychosis spectrum approach, given the high degree of heterogeneity in presentations, response to treatment and outcome. Alternatively, Bentall [26] proposes a symptom-focused approach which is oriented to the specific presenting problems (e.g., voice-hearing, unusual beliefs), without a requirement for diagnostic classification. However, this is far from a settled issue.

Globally, there is a growing movement to rename schizophrenia. Name changes have already been implemented in countries such as Japan, South Korea and Taiwan [27]. Some authors argue that a name change would help to reduce public stigma, improve acceptability of the diagnosis and encourage a reformulation and reconceptualisation of the condition within the scientific community [28, 29]. However, renaming is a complex process which

requires the involvement of multiple stakeholders (e.g., service users, carers, professionals) and there is currently a lack of consensus as to what the alternative name should be [30].

Understanding Public Stigma

Longitudinal studies have been used to explore public perceptions of schizophrenia over time, for example to evaluate the impact of awareness campaigns. Wood et al. [4] used ONS survey data to measure attitudes of the UK public towards schizophrenia, depression and anxiety over a 10-year period (1998-2008). While overall rates of stigma reduced slightly over time, schizophrenia was still viewed significantly more negatively than anxiety and depression at final follow-up. This suggests that attitudes towards schizophrenia remain disproportionately negative, relative to other mental health conditions. Similar findings have been reported internationally [9, 31, 32].

Other studies have measured media representations of mental illness over time. Goulden et al. [6] content analysed British newspaper articles reporting on mental illness (n=1361), from 1992, 2000 and 2008. It was found that schizophrenia featured much less frequently in the media compared to other mental health conditions and coverage was largely negative (focusing on 'Bad News' stories such as 'danger to others'). Interestingly, although this study only looked at articles which were explicitly about mental illness (i.e., excluding slang uses of diagnostic terms), authors noted that the term 'psychotic' was often used inaccurately, in a derogatory manner.

Twitter in Attitudes Research

Social media is an increasingly popular source of data in health research. The micro-blogging platform, Twitter is commonly used to discuss mental health, for example to share experiences, knowledge and raise awareness [33]. Users can interact and share their views by

posting brief messages ('Tweets') of up to 280 characters. Therefore, Twitter may offer a useful insight into public attitudes and discourse [34, 35, 36].

Previous studies have used content analysis to explore attitudes on Twitter towards a range of mental health conditions including schizophrenia, depression, OCD and eating disorders [37-41]. Consistent with the wider literature, findings suggest that schizophrenia is disproportionately stigmatised on Twitter, compared to other mental health conditions.

To our knowledge, only one previous study by Passarello et al. [38] has used Twitter to compare attitudes towards schizophrenia and psychosis, specifically. Surprisingly in the context of other research, psychosis was found to be more frequently stigmatised than schizophrenia. Authors differentiated between noun and adjective forms of diagnostic terms (e.g., 'schizophrenia', 'schizophrenic') however they do not explicitly report on how this impacted on stigma, which is a limitation. Proponents of 'person-first' language suggest that adjectives are more stigmatising than nouns, since it is thought that adjectives objectify the individual and reduce personhood [42].

Research Questions and Hypotheses

We aimed to replicate and extend the work of Passarello et al. [38] by exploring the prevalence of stigma in Tweets using different diagnostic terms (schizophrenia or psychosis) and comparing the use of noun and adjective terms. Building on previous studies [38, 39], we tested the following hypotheses:

H1. Overall, the terms schizophrenia or schizophrenic (schizophrenia/c) will be more frequently associated with stigmatising attitudes, compared to the terms psychosis or psychotic (psychosis/tic) – *Main effect of diagnostic terminology.*

H2. There will be no difference in the prevalence of stigma between Tweets using the word schizophrenic, and those using the word psychotic.

H3. There will be a higher prevalence of stigma in Tweets referring to schizophrenia, compared to Tweets referring to psychosis.

H4. Overall, adjective terms ('schizophrenic' or 'psychotic') will be more frequently associated with stigmatising attitudes, compared to noun terms ('schizophrenia' or 'psychosis') – *Main effect of word forms.*

H5. There will be a greater prevalence of stigma in Tweets using the word schizophrenic, compared to Tweets using the word schizophrenia.

H6. There will be a greater prevalence of stigma in Tweets using the word psychotic, compared to Tweets using the word psychosis.

Method

Design

Quantitative content analysis was used to compare the prevalence of stigmatising attitudes in Tweets using the terms schizophrenia/c and psychosis/tic.

Data Collection

At the time of conducting this study, Twitter permitted users to conduct research using its platform, provided that certain conditions were met [43]. This included that researchers inform Twitter of their intentions by applying for Academic Research Access, and adhere to the Developer Agreement and Policy, which protects users' security and privacy (https://developer.twitter.com/en/developer-terms/agreement-and-policy). CT was granted Academic Research Access by Twitter on 6th November 2022. This enabled access to real-time and historic Twitter data via the Application Programming Interface (API v2).

Sampling

We used the Twitter-approved tool 'Tweet Downloader' (https://developer.twitter.com/apitools/downloader; no longer available) to search the Twitter API v2 for Tweets containing the words 'psychosis', 'psychotic', 'schizophrenia' and 'schizophrenic'. We restricted the search to Tweets published in English, and excluded Retweets. Tweets were downloaded and imported into Microsoft Excel. The data collected comprised of the Tweet, the user's Twitter bio (a short personal description shown on the user's profile), their Twitter handle (public username) and the name of the user as defined on their profile. This data was collected to enable the categorisation of 'user type' (e.g., individual, organisation). Only publicly available Tweets were collected.

Tweets were sampled from an arbitrarily chosen date approximately six months prior to data collection (20th May 2022). The date was checked to ensure that no news items or current affairs of global significance were announced on this date.

Analysis

Development of the Coding Scheme

Tweets were manually coded using quantitative content analysis, based on a coding framework adapted from Passarello et al. [38] (Appendix F). This coding framework [38] was based on a previous study by Reaveley and Pilkington [40] which explored attitudes towards schizophrenia and depression. Quantitative content analysis enabled Tweets to be systematically categorised, based on the presence and type of stigma towards schizophrenia/c and psychosis/tic. The use of a pre-existing coding framework enables comparisons to be drawn over time, with previous Twitter studies.

Inter-Rater Reliability

Initially, two iterations of pilot coding were undertaken by CT and PB using Passarello et al.'s [38] coding framework. A sample of 120 Tweets (not included in the final analysis) were independently coded. Any Tweets that were difficult to categorise were discussed until a consensus was reached. Following this, refinements were made to the coding framework to ensure that any areas which caused disagreement were resolved prior to full coding taking place. Refinements included differentiating between 'neutral or possibly supportive' and 'unambiguously supportive' attitudes, in order to acknowledge ambiguity in the meaning of Tweets, and the addition of a 'conspiracy theories' category, given the obvious prevalence of Tweets referring to conspiracies, typically in the context of the COVID-19 pandemic.

Using the revised coding manual, a further 120 Tweets were independently coded by CT and PB to check for inter-rater reliability. Overall basic agreement (averaged across all categories) was 86.6%, which is acceptable [44]. After full coding by CT, a subset of the final dataset (20% of Tweets, n=100) was randomly generated for reliability coding [45]. Inter-rater reliability testing was completed by a third coder (LM). A training session was provided to enable familiarisation with the study aims and coding manual [44]. Overall basic agreement was 87.0%. Category-specific inter-rater agreement is shown in Appendix G.

Final Coding Scheme

Prior to coding, Tweets were screened using the following exclusion criteria:

a) Lack of context: where the Tweet was unable to be understood by the reader or the Tweet was a spam Tweet with no meaning behind it.
b) Non-English: where all or the majority of the Tweet was not in English.
c) Repetition: where the Tweet was exactly the same as another Tweet in the dataset.
d) Retweet: a reposted or forwarded Tweet that was originally posted by another user.

If included, each tweet was coded into either three or four categories (shown below). Full category definitions are presented in Appendix F.

a) User type: individual, consumer, health professional, organisation and mental health advocate.
b) Tweet content: personal experience of mental illness, awareness promotion and resources, research findings, advice giving, advertisement, news media and personal opinion or dyadic interaction.
c) Attitude: stigmatising, personal experience of stigma, supportive, neutral or possibly supportive, and anti-stigma.
d) If category (c) indicated stigma, stigma type: social distancing, dangerousness, snap out of it, personal weakness, inaccurate beliefs, conspiracy theories, mocking or trivialising, and self-stigma.

Confidence Ratings

In addition to the process adopted by Passarello [38], Tweets were given confidence ratings relating to the classification of stigma, and an overall confidence rating for the categorisation of the Tweet. This aimed to increase the rigour of the coding process. Confidence was rated on a 0-4 scale:

0) Not relevant and does not apply
1) Probably does not apply
2) May apply, but significant uncertainty as to meaning
3) Probably relevant and applies, but some doubt as to context or intended meaning
4) Category clearly relevant and applies to this Tweet

Tweets which were given an overall confidence rating of 2 or less (i.e., Tweets which were significantly ambiguous and therefore difficult to code) were excluded from the analysis.

Analysis Plan

Quantitative content analysis enabled Tweets to be systematically categorised according to the presence and type of stigma. Fisher-Freeman-Halton exact tests were used to compare the prevalence of stigma in Tweets using the terms schizophrenia/c and psychosis/tic. All statistical analyses were conducted using SPSS version 29.0.

Ethics

CT was granted Academic Research Access from Twitter, to complete the study (Appendix H) and ethical approval was obtained from the University of East Anglia Faculty of Medicine and Health Sciences (FMH) Research Ethics Committee (Appendix I). A Protection Impact Assessment (DPIA) was also completed after ethical approval was gained. Although only publicly available personal data were collected, in line with recommendations from the DPIA the dataset was anonymised as soon as coding was complete, by deleting the user's name, Twitter handle and bio. This ensured that the retained dataset did not include any personally identifiable data, so was not subject to the Data Protection Act or General Data Protection Regulation (GDPR).

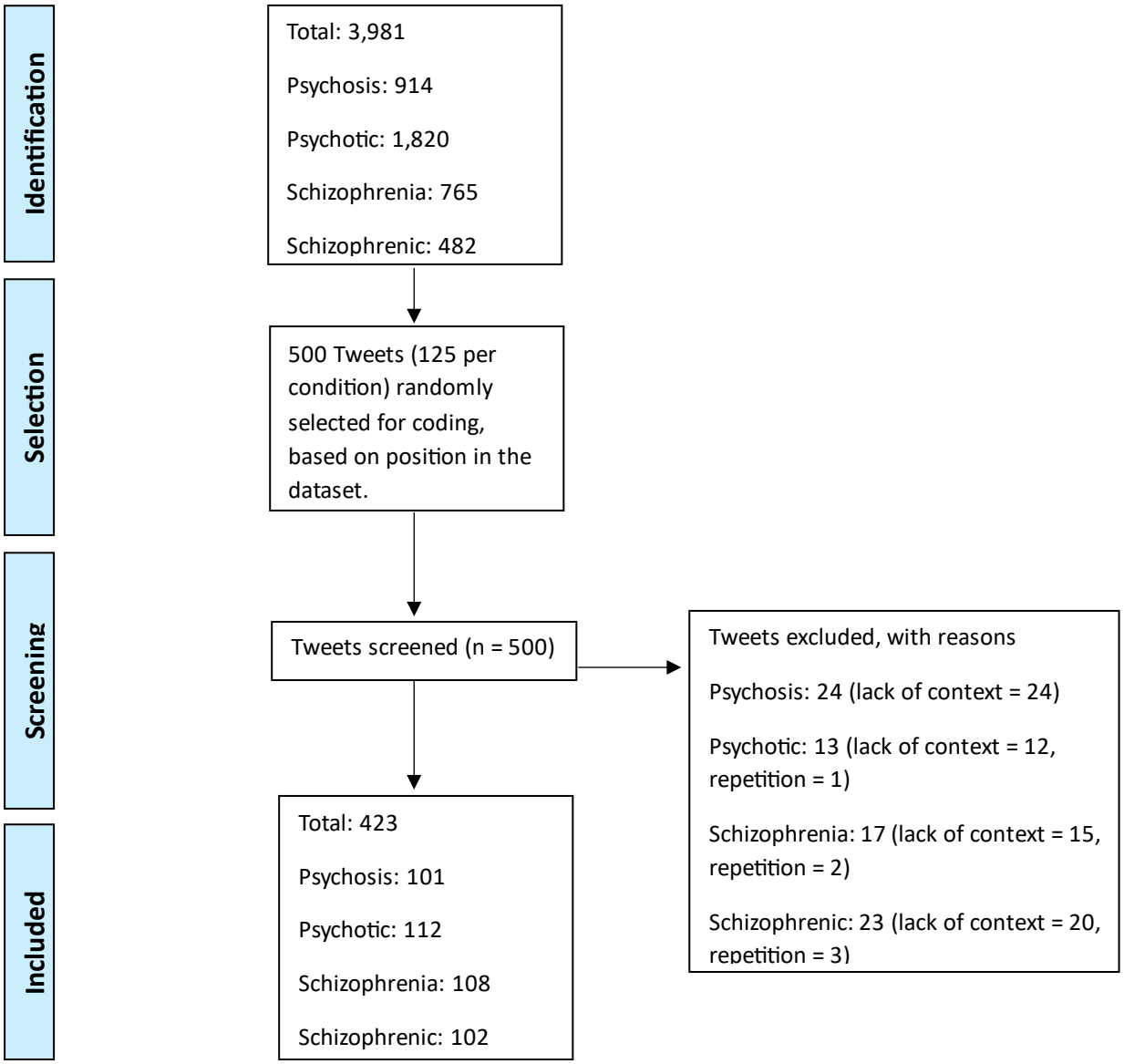
Results

Inclusion and Exclusion

Figure 3 shows the method by which Tweets were identified and assessed for eligibility.

Figure 3.

Identification and Screening of Tweets



User Type and Tweet Content

Regarding 'user types', across all terms most Tweets were derived from individuals. The next most common user type was consumers (i.e., users referring to personal experience of mental illness). A minority of Tweets were from organisations, health professionals or mental health advocates.

Regarding Tweet content, across all terms most Tweets consisted of personal opinion or a dyadic interaction between users. The second most common category was personal experience of mental illness. Tweets using adjective terms contained a considerably higher proportion of personal opinion than Tweets using nouns. This difference was particularly pronounced for schizophrenia/c. 'Schizophrenia' Tweets contained the highest proportion of awareness promotion (15.7%, *n*=17) and research findings (8.3%, *n*=9) of any term. A minority of Tweets contained news media or advertisements.

Table 5 shows the proportion of user types and type of Tweet content for each term.

Table 5.

The Percentage of Tweets in each 'User Type' and 'Content' Category.

	Schizophrenic	Schizophrenia	Psychotic	Psychosis
		User type		
Individual	82.4 (85)	70.4 (76)	94.6 (106)	78.2 (79)
Consumer	10.8 (11)	17.6 (19)	4.5 (5)	15.8 (16)
Organisation	0	7.4 (4)	0.9 (1)	1 (1)
Health professional	5.9 (6)	0.9	0	2 (2)
Mental health advocate	0	3.7	0	3 (3)
		Tweet content		
Personal experience	9.8 (10)	14.8 (16)	2.7 (3)	14.9 (15)
Awareness promotion	1 (1)	15.7 (17)	1.8 (2)	4 (4)
Research findings	0	8.3 (9)	0	4 (4)
Advice giving	0	0	0	0
Advertisement	0	1.9 (2)	0.9 (1)	2 (2)
News media	0	4.6 (5)	0	2 (2)
Personal opinion	89.2 (91)	54.6 (59)	94.6 (106)	73.3 (74)

Note. *n* shown in brackets.

Attitude

There was a relatively high prevalence of stigmatising attitudes across all conditions. Confidence ratings related to the classification of stigma are provided in Appendix J.

Comparing Word Forms

Comparing attitudes within Tweets using noun and adjective terms, there was a higher prevalence of stigmatising attitudes in Tweets using the adjectives 'schizophrenic' or 'psychotic' (76.6%, *n*=164) than Tweets using the nouns 'schizophrenia' or 'psychosis' (36.4%, *n*=76).

For Tweets using nouns, 55.5% (*n*=116) were rated as neutral or possibly supportive, 36.4% (*n*=76) as stigmatising, 5.7% (*n*=12) as supportive and 1.4% (*n*=3) as anti-stigma.

For Tweets using adjectives, 76.6% (*n*=164) were rated as stigmatising, 21% (*n*=45) as neutral or possibly supportive, and 1.9% (*n*=4) as supportive.

Comparing Diagnostic Terminology

Comparing attitudes in Tweets according to diagnostic terminology, there was a substantially higher prevalence of stigma in Tweets using the terms psychosis/tic (70.9%, *n*=151), than Tweets using the terms schizophrenia/c (42.4%, *n*=89).

For schizophrenia/c, around half of the Tweets were categorised as neutral or possibly supportive (49.5%, *n*=104), 42.4% (*n*=89) were rated as stigmatising 5.7% (*n*=12) as supportive and 1.4% (*n*=3) as anti-stigma.

For psychosis/tic, most Tweets were classed as stigmatising (70.9%, *n*=151), 26.8% (*n*=57) as neutral or possibly supportive, 1.9% (*n*=4) as supportive and 0.5% (*n*=1) as anti-stigma.

Comparing Specific Terms

For ‘schizophrenic’, most Tweets were categorised as stigmatising (62.7%, *n*=64), 32.4% (*n*=33) were rated as neutral or possibly supportive, and 3.9% (*n*=4) were supportive.

For ‘schizophrenia’, most Tweets were classed as neutral or possibly supportive (65.7%, *n*=71), 23.1% (*n*=25) were rated as stigmatising, 7.4% (*n*=8) as supportive and 1.9% (*n*=2) as anti-stigma.

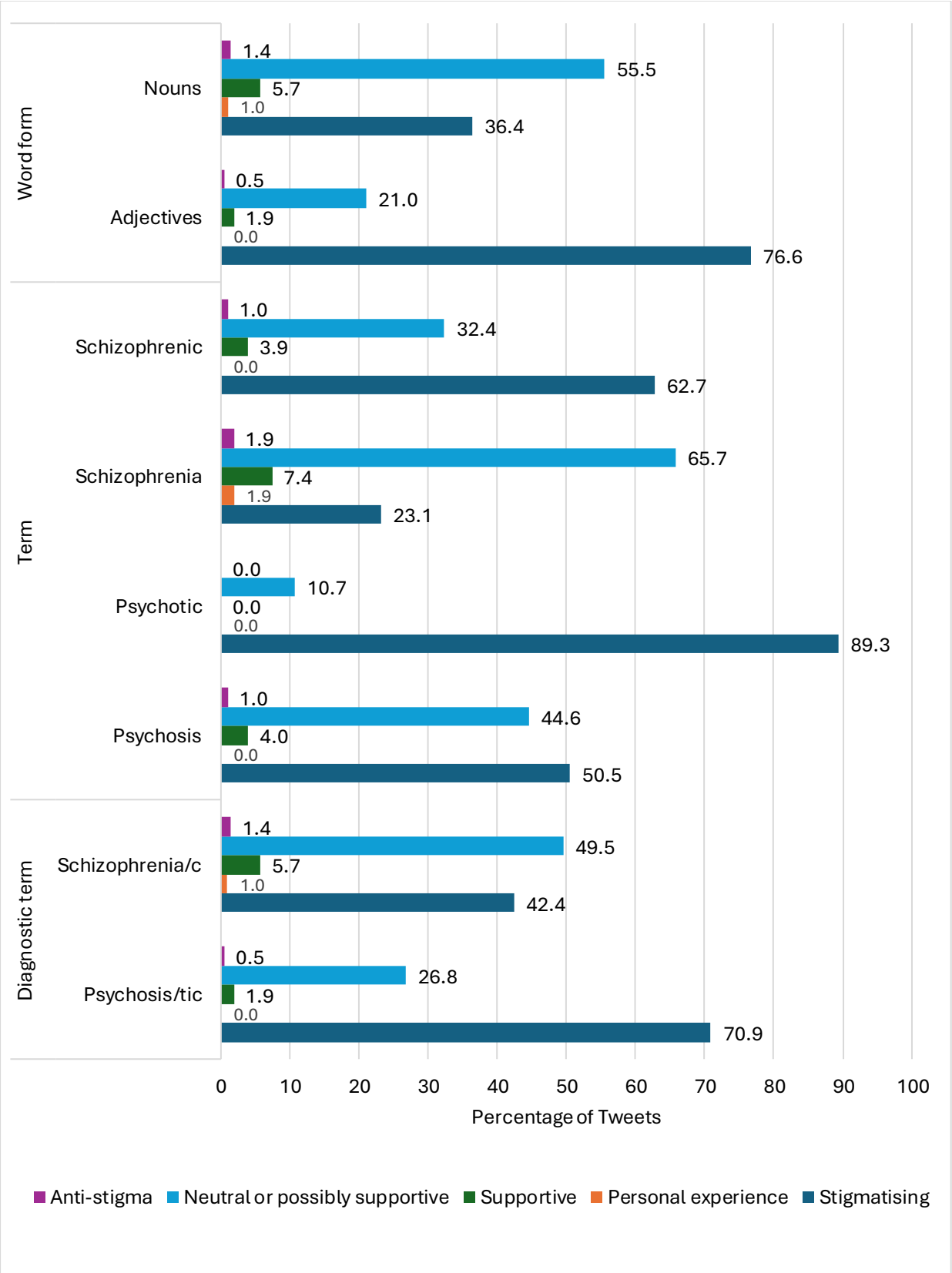
For ‘psychotic’, most Tweets were rated as stigmatising (89.3%, *n*=100), and the remaining 10.7% (*n*=12) were classed as neutral or possibly supportive.

For ‘psychosis’, half of the Tweets were rated as stigmatising (50.5%, *n*=51), 44.6% (*n*=45) were rated as neutral or possibly supportive, 4% (*n*=4) as supportive and 1% (*n*=1) as anti-stigma.

Figure 4 shows the proportion of Tweets in each ‘attitude’ category.

Figure 4.

The Proportion of Tweets in Each 'Attitude' Category



Stigma Type

Regarding the type of stigma, for ‘schizophrenic’ most stigmatising Tweets were categorised as mocking or trivialising (82.2%, *n*=60), 8.2% (*n*=6) as inaccurate beliefs, 5.5% (*n*=4) as social distancing, 1.4% (*n*=1) as self-stigma and 1.4% (*n*=1) as dangerousness.

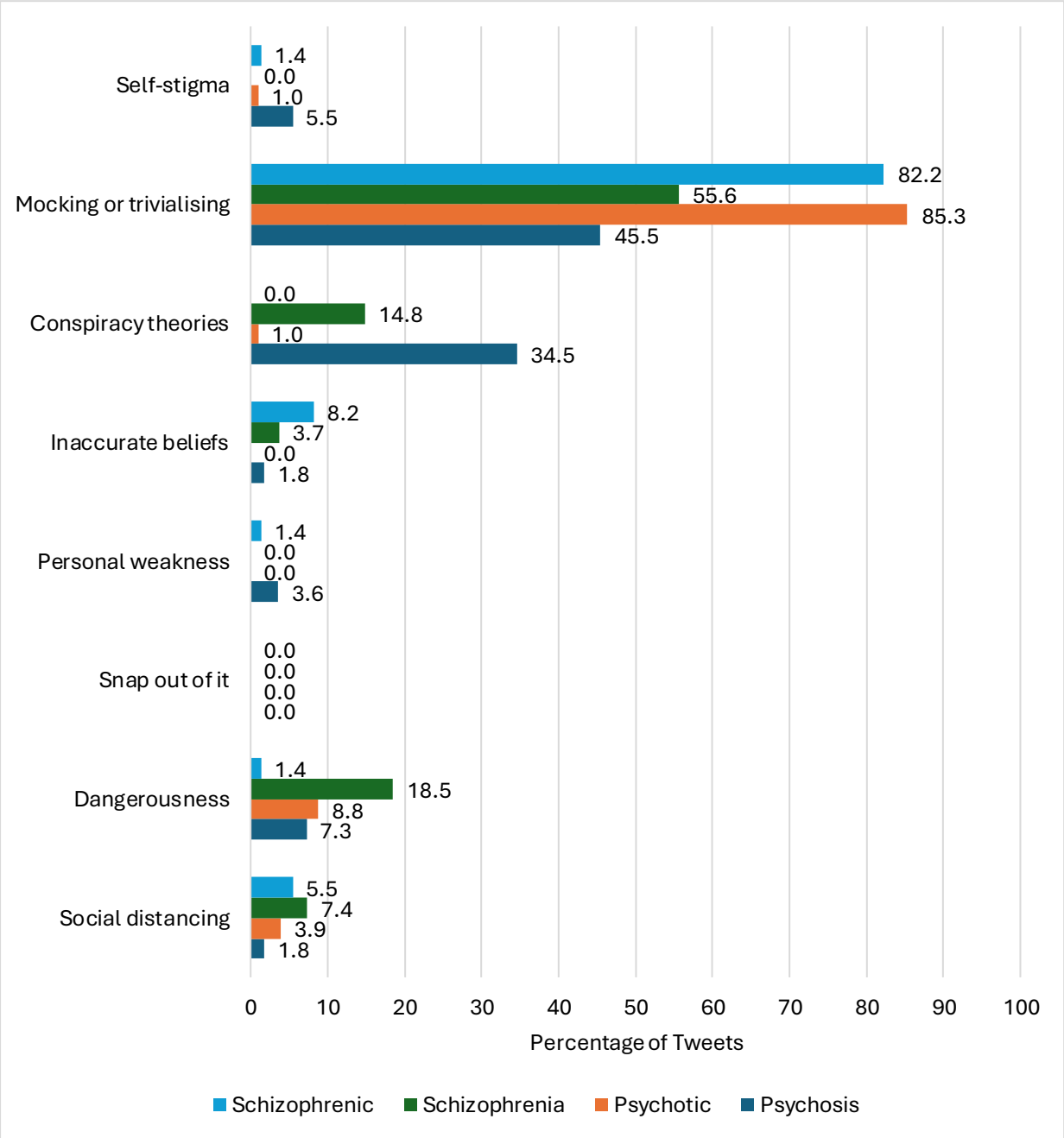
For ‘schizophrenia’, 55.6% (*n*=15) the stigmatising Tweets were classed as mocking or trivialising, 18.5% (*n*=5) as dangerousness, 14.8% (*n*=4) as conspiracy theories, 7.4% (*n*=2) as social distancing and 3.7% (*n*=1) as inaccurate beliefs.

Stigmatising ‘psychotic’ Tweets contained the highest proportion of mocking or trivialising attitudes of any term (85.5%, *n*=87), while 8.8% (*n*=9) were categorised as dangerousness, 3.9% (*n*=4) as social distancing and 1% (*n*=1) as self-stigma.

Stigmatising ‘psychosis’ Tweets contained the highest proportion of conspiracy theories (34.5%, *n*=19), while 45.5% (*n*=25) were rated as mocking or trivialising, 7.3% (*n*=4) as dangerousness, 5.5% (*n*=3) as self-stigma, 3.6% (*n*=2) as personal weakness, 1.8% (*n*=1) as inaccurate beliefs and 1.8% (*n*=1) as social distancing.

Figure 5.

The Proportion of Stigmatising Tweets in Each 'Stigma Type' Category



Statistical analysis

Fisher-Freeman-Halton exact tests [46] were carried out to test hypotheses 1-6 (Table 6) as for each of the planned statistical analyses, data did not meet chi-square assumption due to small expected cell counts [47]. Cramer's *V* was used to measure effect size. Regarding planned post-hoc comparisons, focusing on the prevalence of stigmatising attitudes specifically, adjusted standardised residuals (z-scores) were computed for each cell of the 5 x 2 contingency tables and p-values were then calculated [48].

Table 6.

Results of Fisher-Freeman-Halton Exact Tests and Post-Hoc Analyses for Hypotheses 1-6

A priori hypotheses	Supported?	Fisher-Freeman-Halton Exact Test, two-tailed p-value	Cramer's *V* (effect size)	Prevalence of stigmatising attitudes	P-value for stigmatising attitudes
H1. Overall, the terms schizophrenia or schizophrenic (schizophrenia/c) will be more frequently associated with stigmatising attitudes, compared to the terms psychosis or psychotic (psychosis/tic) – *Main effect of diagnostic terminology.*	No	<.001	.295, p<.001	Schizophrenia/c: 42.4% (*n*=89) Psychosis/tic: 70% (*n*=151)	<.001
H2. There will be no difference in the prevalence of stigma between Tweets using the word schizophrenic, and those using the word psychotic.	No	<.001	.323, p<.001	Schizophrenic: 62.7% (*n*=33) Psychotic: 89.3% (*n*=100)	<.001
H3. There will be a higher prevalence of stigma in Tweets referring to schizophrenia, compared to Tweets referring to psychosis.	No	<.001	.295, p<.001	Schizophrenia: 23.1% (*n*=25) Psychosis: 50.5% (*n*=51)	<.001
H4. Overall, adjective terms ('schizophrenic' or 'psychotic') will be more frequently associated with stigmatising attitudes, compared to noun terms ('schizophrenia' or 'psychosis') – Main effect of word forms.	Yes	<.001	.408, p<.001	Adjectives: 76.6% (*n*=164) Nouns: 36.4% (*n*=76)	<.001
H5. There will be a greater prevalence of stigma in Tweets using the word schizophrenic, compared to Tweets using the word schizophrenia.	Yes	<.001	.405, p<.001	Schizophrenic: 62.7% (*n*=64) Schizophrenia: 23.1% (*n*=25)	<.001
H6. There will be a greater prevalence of stigma in Tweets using the word psychotic, compared to Tweets using the word psychosis.	Yes	<.001	.431, p<.001	Psychotic: 89.3% (*n*=100) Psychosis: 50.5% (*n*=51)	<.001

Note. $V \leq 0.2$ = weak association, < 0.2 $V \leq 0.6$ = moderate association, $V > 0.6$ = strong association [49].

Discussion

We aimed to replicate and extend the work of Passarello et al. [38] by comparing the prevalence of stigma in Tweets using different diagnostic terms (schizophrenia and psychosis) in their noun and adjective forms.

Most importantly, stigmatising attitudes were prevalent across all conditions. There were no terms which were not subject to relatively frequent stigmatisation. Comparing diagnostic terminology, stigma was significantly more prevalent in Tweets referring to psychosis/tic (70.9%) than Tweets referring to schizophrenia/c (42.4%), which is consistent with Passarello et al.'s [38] finding. As expected, stigma was significantly more prevalent in Tweets using adjectives (76.6%) than Tweets using nouns (36.4%). The most stigmatised term was 'psychotic', followed by 'schizophrenic'. 'Psychotic' was frequently used as an insult. Consistent with Passarello et al.'s [38] findings, but surprising in the context of other research, 'schizophrenia' was the least stigmatised term. Across all terms, the most common type of stigma was mocking or trivialisation. Most Tweets consisted of personal opinion.

These findings can be compared with previous studies which used Twitter to explore attitudes towards psychosis and/or schizophrenia [37-41]. Passarello et al. [38] found that Tweets using the terms psychosis/tic more commonly contained stigmatising attitudes (31.5%, *n*=131) than Tweets using the terms schizophrenia/c (9.6%, *n*=41). The current study found the same result, however we observed a substantially higher prevalence of stigma towards both diagnostic terms. This difference is even more pronounced when compared to earlier studies, suggesting a potential increase in stigmatisation of these terms on Twitter over time. Indeed, nearly ten years prior to the current study Reaveley and Pilkington [40] compared stigma in Tweets using the hashtags #schizophrenia and #depression. In contrast to the current study, most Tweets referring to schizophrenia were categorised as neutral (42%, *n*=193) or supportive (42%, *n*=191), with just 5% (*n*=21) rated as stigmatising. Notably,

within Reaveley and Pilkington's study [40], Tweets about schizophrenia were derived from a wider range of user types, and contained a much smaller proportion of personal opinion (12%, *n*=54) and a higher proportion of awareness promotion and research findings (29%, *n*=132; 22%, *n*=100). By comparison, the current study contained a high proportion of personal opinion, mostly derived from individuals. It seems reasonable to suppose that Tweets aiming to raise awareness or share research findings are less likely to express negative attitudes, which may help to explain the difference in prevalence of stigma. Nonetheless, the current study and findings from more recent research [37, 38, 41] suggest that levels of psychosis-related stigma on Twitter have increased over the past ten years.

We found a higher prevalence of stigma towards adjective terms. Many Tweets appropriated 'psychotic' as an insult, rather than referring to psychosis as a mental health presentation. Indeed, 'psychotic' Tweets contained the highest proportion of mocking or trivialising attitudes. Commonly, 'psychotic' was used in reference to polarising public figures (e.g., Donald Trump, Elon Musk). While there is a lack of research concerning the use of the word 'psychotic' specifically, similar findings related to the pejorative use of adjectives have been reported in previous Twitter research [39, 41]. Joseph et al. [39] compared attitudes in Tweets using the noun and adjective forms of schizophrenia and diabetes. Of all terms, 'schizophrenic' Tweets contained the highest proportion of medically inaccurate (30.1%) and non-medical uses (33.3%). Interestingly, 'schizophrenic' Tweets were more likely to be negative and sarcastic when not referring to the illness itself. Together, these findings suggest a high prevalence of pejorative uses of psychosis-related terms on Twitter. The misappropriation of diagnostic terms within the public sphere may contribute to pejoration (i.e., a shift in meaning) of these terms over time.

We observed a higher prevalence of stigma in Tweets using the terms psychosis/tic, compared to Tweets using the term schizophrenia/c. This adds to a small body of literature

which suggests that psychosis is associated with experiences of both public stigma (e.g., within social networks) and internalised stigma (including reduced self-confidence and a negative self-image [50, 51]. This suggests that if schizophrenia is renamed, 'psychosis' may not be a suitable replacement, having acquired its own stigmatic connotations. An intriguing study by Maletta and Vass [52] provides further evidence to support this view. Authors used linguistic software to analyse the emotional tone of UK newspaper articles containing the words 'schizophrenia' and 'psychosis' (n=9,802) between 2000-2019. On average, psychosis was associated with a slightly more negative tone than schizophrenia in newspaper reports. Furthermore, both terms were discussed increasingly negatively over time.

Strengths and Limitations

To our knowledge, this is the first study to systematically compare attitudes in Tweets using the terms 'schizophrenia' and 'psychosis' in their noun and adjective forms. Previous Twitter studies have focused only on schizophrenia [40], or schizophrenia and psychosis together [37, 41]. We used an established methodology to analyse the content of Twitter posts, which allowed comparisons to be made with previous work. We took several measures to maximise reliability of the content analysis (e.g., involving a second coder, assessing inter-rater reliability).

A potential limitation of the study is the sample size. We randomly sampled 500 Tweets from a single point in time. Variable sample sizes are reported within the Twitter literature, however a larger dataset collected over a period of time, such as Robinson et al.'s study [37] may provide a more comprehensive overview of Twitter content as a whole. Nonetheless, we identified themes with a relatively high prevalence, suggesting that the sample size was sufficient to detect themes within the data [53].

We included all uses of the terms psychosis/tic and schizophrenia/c. Many psychosis/tic Tweets used the terms colloquially, rather than to refer to mental illness. Therefore, the stigmatising use of these terms may not reflect an intention to stigmatise psychosis itself. Rather, this may indicate the way in which psychosis-related terms have been adopted and appropriated within popular culture. Studies have shown that terms such as 'psychotic' are commonly used inaccurately and pejoratively within the media [6, 54]. Future research may benefit from differentiating between medical and non-medical uses of psychiatric terms [39].

This study took place during the COVID-19 global pandemic. We observed a high prevalence of Tweets referring to 'mass formation psychosis', in the context of anti-vaccination conspiracies [55]. This suggests that the pandemic may have influenced trends in the use of psychosis-related terms.

This study did not utilise Patient and Public Involvement (PPI). The potential benefits of PPI were weighed against concerns about exposure to distressing social media content during conceptualisation of the study. On reflection, PPI may have increased the external validity of the content analysis. For example, PPI members (e.g., people with lived experience of being impacted by stigmatising online content) could help to provide a perspective on the relevance of existing coding frameworks, considering changes in trends in society and on social media, and to ensure that aspects of stigma which are important to them are accounted for. Two recent studies have reported on PPI approaches to identifying stigma within Tweets, which may provide a helpful reference point for future researchers [56, 57].

Clinical and Research Implications

The current study does not support the view that psychosis is less stigmatised by the public than schizophrenia. It may be that broader efforts to reconceptualise schizophrenia and

address public misconceptions about the nature of mental illness will prove more fruitful in increasing public acceptance, than simply changing the name [58]. It has been argued that schizophrenia lacks construct validity and should abandoned altogether [23, 25, 58].

Several significant changes were made to Twitter following completion of this study. This included the removal of Academic Research Access and the introduction of paid subscriptions, reducing accessibility of the platform. Other social media platforms could potentially be used to study public stigma. Indeed, Facebook has been used to study various health-related topics [60].

Conclusions

This study found that both schizophrenia and psychosis, as diagnostic terms were subject to frequent stigmatisation on Twitter. This suggests that if schizophrenia is to be renamed, psychosis may not be a suitable replacement.

Simply renaming schizophrenia is unlikely to eradicate stigma [58]. Furthermore, it has been argued that the concept lacks validity and requires reconceptualising. Efforts to reduce public stigma should address assumptions regarding the nature of severe mental illness. This may include a recognition that psychosis may arise as an understandable response to adverse life experiences [58, 61].

Declarations

Conflict of interest: The authors declare no competing interests.

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Chapter Five: Discussion and Critical Evaluation

This thesis portfolio aimed to contribute to the literature on public attitudes towards schizophrenia. The purpose of this chapter is to bring together the main findings from the systematic review and empirical project. The papers focused on two different approaches to stigma measurement; namely, the use of questionnaires, and analysis of social media posts. The strengths and limitations of the work are discussed, and the theoretical and clinical implications are considered, including suggestions for future research.

Main Findings

Systematic Review

The AQ-27 (Corrigan et al., 2003) is a widely cited measure of mental illness stigma (Fox et al., 2018). This was the first systematic review to explore the use of translated (i.e., non-English language) versions of the AQ-27 to measure stigma towards schizophrenia. We assessed the quality of the methodology used to translate and adapt the AQ-27, using guidance outlined within the COSMIN Study Design Checklist (Mokkink et al., 2019). It has been argued that a rigorous, multistep approach results in better quality translations, regarding equivalence and validity (Acquadro et al., 2008)

We identified forty-one studies using a translated version of the AQ-27, which included eleven linguistic translations: Spanish, Portuguese, Italian, Chinese languages, Arabic, Hebrew, French, Turkish, Sinhalese, Bengali and Finnish. Studies took place across fifteen countries, nearly two thirds of which (63.4%) were located in Europe. A smaller proportion of studies took place in Asia (22%), Africa (7.3%) and South America (7.3%). The largest samples were obtained from Spain, Italy and Portugal, representing over half (53.7%) of the total participant sample within the review. This highlighted that outside of English-

speaking cultures, the AQ-27 has predominantly been adopted within Western, high-income countries.

While we identified a relatively large number of studies adopting translated versions of the AQ-27, there was considerable heterogeneity in the designs and aims of the included studies. A small subset of the twelve studies carrying out an original translation of the AQ-27 (*n*=4, 33%) were primarily focused on translation and validation of the measure. This was reflected in the rigour of the translation methodology. While the Spanish AQ-27 (Muñoz et al., 2015) had the highest number of citations within the review, the Turkish, Arabic and Italian versions were rated highest in terms of the quality of the translation processes. Several studies provided relatively limited information on the translation approach, beyond the use of forward-backward translation. This approach, when used in isolation (i.e., without committee involvement) is not considered sufficient to guarantee a valid and equivalent translation (Behr, 2017).

Empirical Paper

The empirical paper adds to a body of literature which has used Twitter to explore public attitudes towards schizophrenia (Passarello et al., 2019; Robinson et al., 2019; Joseph et al., 2015). We used quantitative content analysis to measure attitudes in Tweets using the noun and adjective forms of 'schizophrenia' (schizophrenia/c) and 'psychosis' (psychosis/tic). This was a replication and extension of a previous Twitter study by Passarello et al. (2019) which compared attitudes towards schizophrenia and psychosis, grouping noun and adjective terms together. We made some small refinements to Passarello et al.'s coding framework which aimed to increase the rigour of the coding process.

Findings showed that stigma was prevalent across all conditions. However, consistent with Passarello et al.'s (2019), stigmatising attitudes were significantly more prevalent in

Tweets using the terms psychosis/tic (70.9%), than Tweets using the terms schizophrenia/c (42.4%). We also found a substantially higher prevalence of stigma in Tweets using adjective terms (76.6%), compared to those using nouns (36.4%). The most stigmatised term was 'psychotic', which was commonly used as an insult.

Strengths and Limitations

Systematic Review

The systematic review will help future researchers to identify existing translations of the AQ-27, for potential use in a variety of linguistic and cultural settings. This will help to avoid unnecessary duplication of work, where high-quality translations have already been produced. Indeed, in some cases multiple translations had been produced for the same language (e.g., Spanish, Chinese). Importantly, the review will help future researchers to consider the quality of the methodology used to develop existing translations of the AQ-27 before adopting them, since this may have implications for the quality of the measure.

Empirical Paper

The empirical paper contributes to a small body of literature which has explored public attitudes towards the terms 'schizophrenia' and 'psychosis' (Passarello et al., 2019; Maletta & Vass, 2023). We used a published coding framework from the Twitter literature which increases the comparability of findings with previous studies (Passarello et al, 2019; Reaveley and Pilkington, 2014). This enables changes in attitudes to be measured over time.

Regarding limitations, there is a degree of subjectivity in the interpretation of the meaning (and indeed the reader's experience) of Tweets. Tweets are relatively brief pieces of text, and it can be difficult to infer meaning, when taken out of context. We attempted to address this issue by establishing a rigorous coding process through pilot testing of the coding

framework, assessing inter-reliability, and incorporating confidence ratings into the coding framework.

We acknowledge that views expressed on Twitter may not be representative of public opinion. While it was not possible to collect users' demographic information due to ethical considerations, there is some evidence to suggest that Twitter users are not demographically representative of the UK population. Indeed, a study by Mellon & Prosser (2017) found that Twitter users tended to be considerably younger, more highly educated, and more politically engaged compared the British general population. Our study samples the views of internet users who were publicly sharing their views on Twitter and people may express their views differently online in the 'Twittersphere', where they have the ability to remain anonymous (Murthy, 2012) than in face-to-face settings (Chilman et al., 2021). Social media in general has been associated with greater political polarisation (Van Bavel et al., 2021). Therefore, Twitter users' views may not represent those of the general public.

Furthermore, social media has been implicated in the spread of conspiracy theories and misinformation during the COVID-19 pandemic (Kużelewska & Tomaszuk, 2022; WHO, n.d.). The current study sampled Tweets from May 2022, in the aftermath of the pandemic and indeed, we observed a high prevalence of conspiracy theories within stigmatising Tweets containing the word 'psychosis'. This may have contributed to the high level of stigmatising attitudes which were observed. Interestingly, a recent study by Jansli et al. (2022), investigating service users' perceptions of mental health discussions on Twitter during the COVID-19 pandemic found that mental health was discussed more often during later stages of the pandemic. Additionally, Tweets were perceived as increasingly divisive and extreme as time progressed.

Clinical, Research and Theoretical Implications

Stigma Measurement

The systematic review identified several available translations of the AQ-27. Some relatively robust translation approaches were identified (e.g., for the Turkish, Arabic and Italian adaptations). In future, researchers wishing to develop their own translations of the AQ-27 should be aware that a systematic and rigorous approach, based on a robust translation framework and ideally involving a committee approach is recommended to ensure that the translated measure is valid and equivalent within the target culture (Valdez et al., 2021). While this is a time-consuming, costly and labour-intensive process (Acquadro et al., 2008), a poor quality translation may skew data quality and invalidate conclusions drawn from the data (Valdez et al., 2021).

Stigma is arguably a social and cultural construction (Yang et al., 2007; Johnstone & Boyle, 2018). When considering the cross-cultural adaption of existing stigma measures, it is important to note that many of these tools, including the AQ-27 were originally developed and evaluated within Western, English-speaking cultural contexts, such as the UK, USA and Australia (Yang et al., 2014). It is likely that this will inform the way in which mental health is conceptualised and represented within the measures (Oliveira & Baggs, 2023). A report by the Lancet Commission (Patel et al., 2018) highlighted concerns that within the field of global mental, Western, biomedical models of mental health are being extrapolated to define health, illness and treatment across diverse cultural contexts where a variety of different perspectives may be held (Johnstone & Boyle, 2018). An alternative approach to stigma measurement could be to develop culturally specific stigma measures, as opposed to a 'universalist' approach whereby Western-developed measures are assumed to be generalisable to the wider population (Oliveira & Baggs, 2023). Yang et al. (2014) propose a

'what matters most' framework to guide the development of culture-specific measures, which focuses on attempting to understand how stigma threatens the activities that define personhood within the local cultural context. This approach may be better able to capture culture-specific stigma dynamics.

Diversity and Inclusion within Stigma Research

Within the systematic review, most studies using translated versions of the AQ-27 were located within high-income, Western European countries, while other populations and income groups (i.e., low- and middle-income countries) were under-represented. Similar Western-centric biases have been identified in other reviews. For instance, Yang et al.'s (2014) review, focusing on stigma research with non-Western European cultural groups identified that 77% of included studies used adaptations of Western-developed stigma measures (Yang et al., 2014). Additionally, Thornicroft et al.'s (2016) narrative review of anti-stigma intervention research highlighted that fewer than 70% of studies took place in a country other than the USA. Together, these findings suggest that 'WEIRD' biases exist at multiple levels within global stigma research, including in terms of methods of measuring stigma (i.e., conceptualisation of stigma, operationalisation of the construct) and a lack of cultural diversity with regards to the populations being studied (Oliveira & Baggs, 2023). This highlights the importance of considering the extent to which findings are generalisable beyond the population of study. Furthermore, within the current systematic review, the majority of included studies sampled from predominantly female populations (85% of included studies) and a sizeable proportion (42%) sampled university students, who may not represent the views and behaviour of the wider population (Oliveira & Baggs, 2023).

The Renaming of Schizophrenia

The term 'schizophrenia' is increasingly contested, due to its stigmatising connotations and concerns about the validity and utility of the construct (Bentall, 1988). There is some evidence of a consensus among professionals, service users and family members that the name should be changed (Lasalvia et al., 2021; Maruta & Matsumoto, 2017). A review by the Schizophrenia Commission (2012) advised psychiatrists to exercise 'extreme caution' when giving a diagnosis of schizophrenia, due to the stigma and pessimism associated with the term. The term 'psychosis' is commonly used within UK mental health services as an alternative (British Psychological Society, 2017).

Findings from the empirical study contribute to this debate by providing an insight into public attitudes towards the terms schizophrenia/c and psychosis/tic on social media. Findings indicated that both terms were associated with a relatively high level of stigma on Twitter. Consistent with Passarello et al.'s (2019) finding, psychosis/tic was associated with a significantly higher prevalence of stigma than schizophrenia/c on Twitter. This suggests that if schizophrenia is to be renamed in order to reduce stigma, psychosis may not be the most appropriate replacement. Therefore, the question remains as to what the alternative name should be (Bentall, 2013).

Further to the issue of stigma, some academics have argued that the schizophrenia construct lacks validity and needs to be not only renamed, but reconceptualised (Bentall, 2013). Various alternative perspectives have been proposed. This includes notions of replacing schizophrenia as a discrete diagnosis, with a 'psychosis spectrum syndrome', since this may better account for the heterogenous and multidimensional nature of the presentation (van Os, 2016). Alternatively, Bentall (2006) proposes taking a 'complaint-oriented' approach to treatment, whereby interventions focus on the mechanisms underlying specific presenting

difficulties, while abandoning attempts at diagnostic classification altogether. This approach may encourage an exploration of service users' life histories and experiences and facilitate the use of psychological treatments, such as Cognitive Behavioural Therapy to target specific presenting issues (Bentall, 2006).

Broader issues associated with the medicalisation of distress and the potential harms of psychiatric diagnosis, are discussed at length within the Power Threat Meaning Framework (PTMF; Johnstone & Boyle, 2018). This may include feelings of stigma, shame, social exclusion and disempowerment. Alternatively, the PTMF advocates for a non-diagnostic and formulation-based approach to understanding emotional distress, whereby the influence and meaning of social, cultural, political and cultural contextual factors are explored as part of a narrative, formulation-based approach.

Within regards to the language and terminology used within clinical practice, service users' individual views, perspectives and preferences should be sought (British Psychological Society, 2017). Some people may find it helpful to view their experiences as symptoms of an underlying illness, while others may not. For instance, some people may view their experiences as spiritual experiences, or a reaction to challenging life events and circumstances. Interestingly, an international survey by Read (2020) across 30 countries found that people experiencing psychosis are much more likely to offer psychosocial, over biogenetic explanations for their experiences (Read, 2020).

Social Media Research

Twitter can be used to identify common stigmatising attitudes, which could help mental health advocacy organisations to develop targeted awareness campaigns and resources (Reavley & Pilkington, 2014; Fadda et al., 2022). We sampled Twitter posts from a single point in time, however, longitudinal studies could be used to monitor changes in attitudes

over time; for example, to assess the impact of anti-stigma campaigns such as Time to Change.

While some users may experience Twitter as a useful source of support, social media algorithms also have the potential to proliferate harmful messages. This may have a negative impact on individuals and reduce the likelihood of their seeking help (Kwak et al., 2010). One study by Birnbaum et al., (2017) found that the Internet and social media were a 'first port of call' for young people experiencing emerging symptoms of psychosis. This highlights the importance of monitoring the quality and accuracy of online content. Recently, studies have begun to explore the potential for machine learning to be used to detect stigmatising or offensive messages on Twitter (Jilka et al., 2022). This could help social media companies to monitor and respond to these issues, for example, by issuing warnings or account suspensions (Jansli et al., 2022).

In future Twitter research, given the high prevalence of Tweets using terms such as 'psychotic' in a medically inaccurate manner it may be helpful to differentiate between factual and colloquial uses of psychiatric terms (Joseph et al., 2015). This may help to identify stigmatising attitudes towards psychosis itself, and pejorative uses of the term.

Future research could further explore the way in which psychiatric language is used within the print media, as negative coverage is likely to contribute to shaping public perceptions. Maletta and Vass' (2023) study provided a fascinating insight into the longitudinal use of the terms 'schizophrenia' and 'psychosis' within UK newspapers. Given that we observed a significantly higher prevalence of stigmatising attitudes in Tweets using adjective compared to noun forms of these terms, it may be useful to explore the use of noun and adjective terms within the print media.

Overall Conclusion

The systematic review and empirical project contribute to the literature on public attitudes towards schizophrenia, using two different approaches to stigma measurement. Findings from the systematic review highlighted the need for further high-quality translation and validation studies focusing on cross-cultural adaptation of the AQ-27, given that the methodological quality of the translation process may have important implications for the quality of the measure. The empirical paper found that psychosis/tic was more frequently associated with stigmatising attitude on Twitter, compared to schizophrenia/c. However, both terms were associated with a relatively high prevalence of stigma. This suggests that if schizophrenia is renamed in order to reduce stigma, psychosis may not be the most suitable alternative.

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Appendices

Appendix A: European Journal of Psychiatry Author Guidelines

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Introduction

The European Journal of Psychiatry complies with the International Committee of Medical Journal Editor's Uniform Requirements for Manuscripts (detailed examples available at: http://www.ICMJE.org). The overriding criteria for publication are originality, a high scientific quality and interest to a wide audience of those concerned with all aspects of mental illness. The scope is broad and the journal is committed to present new developments in the full spectrum of issues related to psychiatry and mental health, in areas linked to biological, psychological and social sciences. It will include basic studies and the growing application of clinical laboratory techniques in psychiatry. The European Journal of Psychiatry is determined to place particular emphasis on clinical issues related to a personalised medicine, including prevention and early intervention. The journal is currently indexed by the Journal Citation Report (Social Science Edition), the Social Sciences Citation Index and Scopus, among other databases and indexing services.

Types of article

For any section of this journal: Original articles, Review articles, Short communications, Editorials and Letters to the Editor, **the three epigraphs: Ethical considerations, Funding and Conflict of interest** should be added **at the end of the articles and before the References epigraph.**

Conflict of interest: All authors must disclose any financial and personal relationships with other people or organizations that could inappropriately influence (bias) their work. Examples of potential competing interests include employment, consultancies, stock ownership, honoraria, paid expert testimony, patent applications/registrations, and grants or other funding. If there are no interests to declare then please state this: 'Declarations of interest: none'.

Original articles Original articles ideally should not exceed 3,500 words in length, (excluding references, tables and figure legends) and normally would not include more than 30 essential references beyond those related to psychometric instruments and diagnostic guidelines or describing statistical procedures, used in the study. In total, up to six tables or figures may be included. Additional data tables and figures may be included in an online data supplement. The article should contain no citation to other unpublished work. Do not use footnotes or appendices. Such materials should either be incorporated in the text or offered to interested readers on request. All abbreviations should be preceded the first time they appear by the full name except the SI symbols for units which are to be used without explanation. Generic or chemical names should be used for all compounds: identify materials and products. State the species of any animals used precisely. Indicate the sources of unusual

materials and chemicals, and the model and manufacturer of equipment. Identify materials and products by their generic term followed by the trade name in brackets. A short running title should be provided.

Review articles Review articles should be structured in the same way as regular papers, but both the length of these and the number of references may exceed the standard numbers if appropriate. Systematic reviews are preferred.

Article structure

Subdivision - unnumbered sections

Divide your article into clearly defined sections. Each subsection is given a brief heading. Each heading should appear on its own separate line. Subsections should be used as much as possible when cross-referencing text: refer to the subsection by heading as opposed to simply 'the text'.

Introduction

State the objectives of the work and provide an adequate background, avoiding a detailed literature survey or a summary of the results.

Material and methods

Provide sufficient details to allow the work to be reproduced by an independent researcher. Methods that are already published should be summarized, and indicated by a reference. If quoting directly from a previously published method, use quotation marks and also cite the source. Any modifications to existing methods should also be described.

Results

Results should be clear and concise.

Discussion

This should explore the significance of the results of the work, not repeat them. A combined Results and Discussion section is often appropriate. Avoid extensive citations and discussion of published literature.

Conclusions

The main conclusions of the study may be presented in a short Conclusions section, which may stand alone or form a subsection of a Discussion or Results and Discussion section.

Appendices

If there is more than one appendix, they should be identified as A, B, etc. Formulae and equations in appendices should be given separate numbering: Eq. (A.1), Eq. (A.2), etc.; in a subsequent appendix, Eq. (B.1) and so on. Similarly for tables and figures: Table A.1; Fig. A.1, etc.

Structured abstract

A structured abstract, by means of appropriate headings, should provide the context or background for the research and should state its purpose, basic procedures (selection of study subjects or laboratory animals, observational and analytical methods), main findings (giving specific effect sizes and their statistical significance, if possible), and principal conclusions. It should emphasize new and important aspects of the study or observations.

The headings will consist of: «Background and Objectives», «Methods», «Results» y «Conclusions».

Keywords

Immediately after the abstract, provide a maximum of 6 keywords, using British spelling and avoiding general and plural terms and multiple concepts (avoid, for example, 'and', 'of'). Be sparing with abbreviations: only abbreviations firmly established in the field may be eligible. These keywords will be used for indexing purposes.

If no funding has been provided for the research, please include the following sentence:

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Appendix B: The Attribution Questionnaire (AQ-27)

AQ-27
Name or ID Number_____ Date _____

PLEASE READ THE FOLLOWING STATEMENT ABOUT HARRY:

Harry is a 30 year-old single man with schizophrenia. Sometimes he hears voices and becomes upset. He lives alone in an apartment and works as a clerk at a large law firm. He had been hospitalised six times because of his illness.

NOW ANSWER EACH OF THE FOLLOWING QUESTIONS ABOUT HARRY. CIRCLE THE NUMBER OF THE BEST ANSWER TO EACH QUESTION.

1. I would feel aggravated by Harry.

1 2 3 4 5 6 7 8 9
not at all very much

2. I would feel unsafe around Harry.

1 2 3 4 5 6 7 8 9
no, not at all yes, very much

3. Harry would terrify me.

1 2 3 4 5 6 7 8 9
not at all very much

4. How angry would you feel at Harry?

1 2 3 4 5 6 7 8 9
not at all very much

5. If I were in charge of Harry's treatment, I would require him to take his medication.

1 2 3 4 5 6 7 8 9
not at all very much

6. I think Harry poses a risk to his neighbours unless he is hospitalized.

1 2 3 4 5 6 7 8 9
none at all very much

7. If I were an employer, I would interview Harry for a job.

1	2	3	4	5	6	7	8	9
not likely								very likely

8. I would be willing to talk to Harry about his problems.

1	2	3	4	5	6	7	8	9
not at all								very much

9. I would feel pity for Harry.

1	2	3	4	5	6	7	8	9
none at all								very much

10. I would think that it was Harry's own fault that he is in the present condition.

1	2	3	4	5	6	7	8	9
no, not at all								yes, absolutely so

11. How controllable, do you think, is the cause of Harry's present condition?

1	2	3	4	5	6	7	8	9
not at all under personal control								completely under personal control

12. How irritated would you feel by Harry?

1	2	3	4	5	6	7	8	9
not at all								very much

13. How dangerous would you feel Harry is?

1	2	3	4	5	6	7	8	9
not at all								very much

14. How much do you agree that Harry should be forced into treatment with his doctor even if he does not want to?

1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
not at all								very much

15. I think it would be best for Harry's community if he were put away in a psychiatric hospital.

1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
not at all								very much

16. I would share a car journey with Harry every day.

1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
not likely								very much likely

17. How much do you think psychiatric residential care, where Harry can be kept away from his neighbours, is the best place for him?

1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
not at all								very much

18. I would feel threatened by Harry.

1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
no, not at all								yes, very much

19. How scared of Harry would you feel?

1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
not at all								very much

20. How likely is it that you would help Harry?

1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
definitely would not help								definitely would help

21. How certain would you feel that you would help Harry?

1	2	3	4	5	6	7	8	9
not at all certain								absolutely certain

22. How much sympathy would you feel for Harry?

1	2	3	4	5	6	7	8	9
none at all								very much

23. How responsible, do you think, is Harry for his present condition?

1	2	3	4	5	6	7	8	9
not at all responsible								very much responsible

24. How frightened of Harry would you feel?

1	2	3	4	5	6	7	8	9
not at all								very much

25. If I were in charge of Harry's treatment, I would force him to live in a group home.

1	2	3	4	5	6	7	8	9
not at all								very much

26. If I were a landlord, I probably would rent an apartment to Harry.

1	2	3	4	5	6	7	8	9
not likely								very likely

27. How much concern would you feel for Harry?

1	2	3	4	5	6	7	8	9
none at all								very much

The AQ-27 Score Sheet

Name or ID Number_____ Date _____

The AQ-27 consists of 9 stereotype factors; scores for each factor are determined by summing the items as outlined below: Note: items are reversed score prior to summing up for the Avoidance scale.

_____ Blame = AQ10+ AQ11 +AQ23

_____ Anger = AQ1 + AQ4 + AQ12

_____ Pity = AQ9 + AQ22 + AQ27

_____ Help = AQ8 + AQ20 + AQ21

_____ Dangerousness = AQ2 + AQ13 + AQ18

_____ Fear = AQ3 + AQ19 + AQ24

_____ Avoidance = AQ7 + AQ16 + AQ26 (Reverse score all three questions)

_____ Segregation = AQ6 + AQ15 + AQ17

_____ Coercion = AQ5 + AQ14 + AQ25

The higher the score, the more that factor is being endorsed by the subject.

Appendix C: Quality Assessment Tool (Adapted from the COSMIN Study Design Checklist)

	General recommendations Studies on measurement properties require a clear research aim (i.e. referring to the measurement properties of interest), a clear description of the measure and a clear description of the study population. The quality of a measure should be determined in the target population in which the measure will be used, because the results of studies on measurement properties depend on the sample included in the study.					
	Very good - 4	**Adequate - 3**	**Doubtful - 2**	**Inadequate - 1**	**Not reported – 0[a]**	**Not applicable - 0**
Research aim; Provide a clear research aim, including (1) the name and version of the measure, (2) the target population and (3) the measurement properties of interest.	Research aim clearly described			Research aim not clearly described		
Measure structure; Provide a clear description of the structure of the measure (i.e., number of items and subscales included, instructions given and response options) and its scoring algorithm	Structure and scoring algorithm clearly described			Structure and scoring algorithm not clearly described		
Target population – selection criteria; Provide a clear description of in- and exclusion criteria, e.g. age, gender, language or country, and setting (e.g. general population, primary care or hospital/rehabilitation care)	In- and exclusion criteria for participants clearly described			In- and exclusion criteria for participants not clearly described		
Target population - recruitment method; Provide a clear description of the method used to select participants for the study (e.g. convenience, consecutive or random)	Method for participant selection clearly described		Method for participant selection not clearly described			
	Structural validity When the aim of the study is to assess the structural validity of a multidimensional measure, a factor analysis should be performed on the whole scale.					
Structural validity; Perform confirmatory factor analysis.	Confirmatory factor analysis will be performed	Exploratory common factor analysis will be performed		No exploratory or confirmatory factor analysis will be performed		

	Internal consistency Internal consistency should be assessed for each unidimensional subscale.			
Internal consistency; Calculate Cronbach's alpha or Omega for each unidimensional scale or subscale	Cronbach's alpha, or Omega will be calculated		Only item-total correlations will be calculated	No Cronbach's alpha and no item-total correlations will be calculated
	Translation process The process of translating an existing measure is not a measurement property. Rather, it is part of the development phase of a new version of a measure. However, a good translation process will likely result in a more valid version of the measure in the translated language. In this translation box standards are provided to assess the quality of the translation process.			
Forward-backward translation; Ensure that items will be translated forward and backward	Multiple forward and multiple backward translations	Multiple forward but one backward translation	One forward and one backward translation	Only a forward translation
Forward translation; Both forward translators have a mother tongue in the target language in which the measure will be translated	Both forward translators have a mother tongue in the target language in which the measure will be translated		Only one of the translators have a mother tongue in the target language in which the measure will be translated	Both forward translators don't have a mother tongue in the target language
Forward translation; Ensure that one of the forward translators has expertise in the construct measured; the other forward translators is naïve on the construct measured	One of the forward translators has expertise on disease and construct to be measured, other translator is naïve	Unclear what expertise of both forward translators with respect to disease or construct	Both forward translators are either both experts with respect to disease or construct, or both naïve with respect to disease or construct	

Backward translation; Ensure that both backward translators have a mother tongue in the original or source language	Both forward translators have a mother tongue in the source language in which the PROM will be translated		Only one of the forward translators a mother tongue in the source language in which the PROM will be translated	Both forward translators don't have a mother tongue in the source language
Backward translation; Ensure that both backward translators are naïve in the disease involved and the construct to be measured	Both backward translators will be naïve in the disease involved and the construct to be measured	Unclear if both backward translators will be naïve in the disease involved and the construct to be measured		
Independent translation; Ensure that the translators will work independently from each other	Translators will work independently	Assumable that the translators will work independently	Unclear whether translators will work independently	Translators will NOT work independently
Resolving differences; Provide a clear description on how differences between the original and translated versions will be resolved	Adequate description of how differences between translators will be resolved	Poorly or NOT described how differences between translators will be resolved		
Committee review; Ensure that the translation will be reviewed by a committee (including the original developers of the measure)	Translation will be reviewed by a committee (involving other people than the translators, e.g. the original developers)	Translation will NOT be reviewed by (such) a committee		
Feedback report; Write a feedback report of the translation process	Feedback report will be written		No feedback report will be written	

Pilot study; Perform a pilot study (e.g. cognitive interview study) to check the comprehensibility of the measure instructions, items, response options, and recall period	Widely recognized or well justified method for qualitative research will be used to assess the three aspects.	Only quantitative (survey) method(s) will be used or assumable that the method used will be appropriate but not clearly described.	Not clear if patients will be asked whether each item is comprehensible, or doubtful whether the method will be appropriate.	Method used are not appropriate or patients will not be asked about the comprehensibility of all items.

[a]Where relevant information was not reported and none of the scoring criteria were applicable, items were scored 0.

Appendix D: Results From the Quality Appraisal for the Systematic Review

Criteria (scoring)	Muñoz et al. (2015)	Chamorro-Coneo et al. (2022)	Crespo et al. (2008)	Pingani et al. (2012)[a]	Chiu et al. (2021)	Ho et al. (2018)	Saguem et al. (2021)[a]	Romem et al. (2006)	Akyurek et al. (2019)[a]	Bamini-watta et al. (2023)	Giasuddin et al. (2015)	Ihalainen-Tamlander et al. (2016)
Research aim (4-1)	4-clearly described	4-clearly described	4-clearly described	4-clearly described	4-clearly described	4-clearly described	4-clearly described	4-clearly described	4-clearly described	4-clearly described	4-clearly described	4-clearly described
Described structure of measure (4-1)	4-clearly described	1-not clearly described	4-clearly described	4-clearly described	4-clearly described	4-clearly described	4-clearly described	1-not clearly described	4-clearly described	4-clearly described	1-not clearly described	4-clearly described
Eligibility criteria (4-1)	4-clearly described	1-not clearly described	1-not clearly described	4-clearly described	1-not clearly described	1-not clearly described	4-clearly described	4-clearly described	4-clearly described	4-clearly described	4-clearly described	4-clearly described
Recruitment method (4-2)	4-clearly described	4-clearly described	4-clearly described	4-clearly described	4-clearly described	4-clearly described	2-not clearly described	4-clearly described	4-clearly described	4-clearly described	4-clearly described	4-clearly described
Structural validity (4-3-1)	1-no FA	1-no FA	1-no FA	1-CFA	3-EFA	3-EFA	1-no FA	1-no FA	4 - CFA	1-no FA (N/A to AQ-9)	1-no FA	1-no FA
Internal consistency (4-2-1)[c]	4-total α and subscale α	4- subscale α	2-total α only	4-total α, subscale α	2-total α only	2-total α only	4-total α and subscale α	4- subscale α	2-total α and item α	N/A (single item domains)	2-total α only	1-no α reported
Forward and backward translation (4-3-2-1)	2-one F/B	2-one F/B	2-one F/B	4-multiple F/B	1-F only	2-one F/B	4-multiple F/B	1-F only	4-multiple F/B	2-one F/B	4-multiple F/B	4-multiple F/B
Forward translators; both mother tongue (4-2-1-0)[b]	0-not stated	0-not stated	0-not stated	4-native Italian speakers	0-not stated	0-not stated	0-not stated	0-not stated	0-not stated	0-not stated	0-not stated	0-not stated

Criteria (scoring)	Muñoz et al. (2015)	Chamorro-Coneo et al. (2022)	Crespo et al. (2008)	Pingani et al. (2012)[a]	Chiu et al. (2021)	Ho et al. (2018)	Saguem et al. (2021)[a]	Romem et al. (2006)	Akyurek et al. (2019)[a]	Bamini-watta et al. (2023)	Gia-suddin et al. (2015)	Ihalainen-Tamlander et al. (2016)
Forward translators; one with expertise, one naïve (4-3-2)	2-experts (study authors)	3-unclear	2-experts (study authors)	3-unclear	0-not stated	2-experts (study authors)	3-unclear	3-unclear	4-two translators with expertise, two naive	3-unclear	3-unclear	3-unclear
Backward translators; both mother tongue (4-2-1)	0-not stated	0-not stated	0-not stated	0-not stated	N/A-no backward translation	0-not stated	0-not stated	N/A-no backward translation	4-native English speakers	0-not stated	0-not stated	0-not stated
Backward; both naïve (4-3)	3-unclear	3-unclear	3-unclear	3-unclear	N/A-no backward translation	3-unclear	4-naïve to AQ	N/A-no backward translation	4-no medical expertise	3-unclear	3-unclear	3-unclear
Independent translators (4-3-2-1)	2-unclear	3-assumable	1-no	4-yes	0-not stated	1-no	4-yes	4-yes	4-yes	2-unclear	2-unclear	4-yes
Resolving differences, original and translated version (4-3)	3-poorly or NOT described	4-adequate description	3-poorly or NOT described	3-poorly or NOT described	3-poorly or NOT described	3-poorly or NOT described	3-poorly or NOT described	3-poorly or NOT described	4-adequate description	3-poorly or NOT described	4-adequate description	4-adequate description
Review by committee (4-3)	3-NO committee review	3-NO committee review	3-NO committee review	3-NO committee review	3-NO committee review	4-committee review	4-committee review	3-NO committee review	4-committee review	4-committee review	3-NO committee review	4-committee review
Pilot study (4-3-2-1-0)[b]	2-method not described	2-method not described	0-no pilot study	3-group interviews	0-no pilot study	0-no pilot study	3-method assumed appropriate	0-no pilot study	4-interviews	0-no pilot study	0-no pilot study	3-method assumed appropriate
Overall quality rating (max = 60, min = 21), rank	38, 5th	35, 6th	30, 10th	48, 2nd	25, 11th	33, 8th	44, 3rd	32,9th	54, 1st	34, 7th	35, 6th	43, 4th

[a]Studies primarily aiming to translate and evaluate the psychometric properties of the AQ-27.

Appendix E: Social Psychiatry and Psychiatric Epidemiology Author Guidelines

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Submission guidelines

Types of Papers

Papers must be written in English.

Accepted article types: Research, Review, Brief Report, Editorial, Comment, Correspondence, and Study Protocol.

Research papers or Reviews should not exceed 4,500 words, not including references, plus 5 tables or figures. An abstract (150 to 250 words) and 4-6 keywords are required (please see also section 'title page').

Abstract

Please provide a structured abstract of 150 to 250 words which should be divided into the following sections:

- Purpose (stating the main purposes and research question)
- Methods
- Results
- Conclusion
- For life science journals only (when applicable)

Trial registration number and date of registration for prospectively registered trials

Trial registration number and date of registration followed by "retrospectively registered", for retrospectively registered trials.

Keywords

Please provide 4 to 6 keywords which can be used for indexing purposes.

Statements and Declarations

The following statements should be included under the heading "Statements and Declarations" for inclusion in the published paper. Please note that submissions that do not include relevant declarations will be returned as incomplete.

Headings

Please use no more than three levels of displayed headings.

Abbreviations

Abbreviations should be defined at first mention and used consistently thereafter.

Footnotes

Footnotes can be used to give additional information, which may include the citation of a reference included in the reference list. They should not consist solely of a reference citation, and they should never include the bibliographic details of a reference. They should also not contain any figures or tables.

Ethical standards

Manuscripts submitted for publication must contain a statement to the effect that all human and animal studies have been approved by the appropriate ethics committee and have therefore been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki and its later amendments.

It should also be stated clearly in the text that all persons gave their informed consent prior to their inclusion in the study. Details that might disclose the identity of the subjects under study should be omitted.

These statements should be added in a separate section before the reference list. If these statements are not applicable, authors should state: The manuscript does not contain clinical studies or patient data.

Appendix F: Coding Manual for Empirical Study

Exclusion criteria

Prior to full coding, Tweets will be screened and excluded based on the following criteria:

a) Lack of context: where the tweet is unable to be understood or categorised by the reader, or the tweet was a spam tweet with no meaning behind it.
b) Non-English: where all or the majority of the tweet is not in English.
c) Repetition: where the content of the tweet is exactly the same as another tweet in the dataset.
d) Retweet: a reposted or forwarded tweet that was originally posted by another user.

Coding framework

Each Tweet is coded into either three, or four categories:

a) User type: individual, consumer, health professional, organisation or advocate.
b) Tweet content: personal experience of mental illness, awareness promotion and resources, research findings, advice giving, advertisement, news media and personal opinion or dyadic interaction.
c) Attitude: stigmatising, personal experience of stigma, supportive, neutral or possibly supportive, and anti-stigma.
d) If category (c) indicated stigma, stigma type: social distancing, dangerousness, snap out of it, personal weakness, inaccurate beliefs, conspiracy theories, mocking or trivialising, and self-stigma.

General guidelines for coding

- Ratings focus on **how the reader may experience the tweet** (e.g., does the tweet appear stigmatising, mocking, sarcastic)
- If the intended meaning or context of the tweet is not clear, consider whether it is still possible to categorise the tweet (e.g. does it appear stigmatising). Overall confidence ratings may be lower in these cases
- Do not google things
- Do not click on hyperlinks within tweets
- During coding, take at least a 10 minute break every hour

Confidence ratings (0-4) are made as follows:

- 4 = category clearly relevant and applies to this Tweet
- 3 = probably relevant and applies, but some doubt as to context or intended meaning
- 2 = may apply, but significant uncertainty as to meaning
- 1 = probably does not apply
- 0 = not relevant and does not apply

Tweets with a rating of 2 or less will be excluded from the analysis.

Category Definitions and Example Tweets - adapted from Passarello et al. (2019)[a]

Self-identified user type (rate as x – pick best option)

Category	Definition
Individual	A user who does not specify whether they suffer from a mental illness
Consumer	A user who states or implies on their profile or within the sample tweet, that they suffer from, or have personal experience of mental illness (does not include family members)
Organisation	A user who states on their profile, or implies within the sample tweet that they are representing an organisation, or group of people (e.g., media, charities, NGOs)
Health professional	A user who claims to be a registered healthcare professional (e.g., nurse, doctor, counsellor, psychologist), on their profile or within the sample tweet
Mental health advocate	A user who states on their profile, or within the sample tweet, that they are a mental health advocate (e.g. life coach, charity worker)

Tweet Content (choose best option)		Example Tweet[a]	
		Schizophrenia/schizophrenic	**Psychosis/psychotic**
Personal experience of mental illness	The user expresses their personal experience of having a mental illness, or distress associated with mental illness (note – this does not include family members)	As a #schizophrenic, my social brain is not all what it could be. Twitter seems like an avalanche of media frenzy 24/7 but maybe I'm nub :/	Having a rough time lately with my #mentalhealth Feeling exhausted and just not myself #depression #anxiety #psychosis
[b]Awareness promotion and resources	The user promotes awareness about schizophrenia or psychosis, by providing information or pointing users in the direction of any source of information (regardless of whether or not this appears to be helpful)	Schizophrenia truth and myths https://t.co/wGYFtMBNRa #schizophrenia #mentalhealth	Did you check out our video library yet? It's full of helpful resources about #schizophrenia & #psychosis https://t.co/CMuFhZb9QC
Research findings	The user details outcomes in research by summarizing or linking to publications and articles	#Mental problems such as #schizophrenia and #bipolar disorder could be linked to a yeast infection in the #gut https://t.co/v1u1CBQZod	Young people with #psychosis have a 24× greater risk of death than their peers: https://t.co/KnGBZjMZZA

[b]Advice giving	The user suggests or tells the reader what they should do	n/a	n/a
Advertisement	The user advertises events or products and services for sale	Applications close soon: Neuroscience PhD Projects in our lab (School of Medicine, Uni of #Wollongong #Australia) http://bit.ly/2y2D7Fs #uow #neuropharmacology #MedicinalCannabis #cannabinoids #depression #schizophrenia #cognition #microbiota #FindAPhD #PhD #DoSomethingAmazing	Don't miss HOAX Our Right to Hope @HoaxOrth Award-winning trilogy of art on #psychosis Liverpool & Salford https://t.co/apUVQRNEYP
News media	The user tweets a summary of, or hyperlink to, a news story	Mental health trust is asked to take action after death of Norwich man at hospital unit #schizophrenia #bhive https://t.co/eZ51APnuCg	Antiques Roadshow expert died after psychotic episode, inquest hears- #postpartum #psychosis https://t.co/lppuWm3N6O
Personal opinion/dyadic interaction	The user in conversation with someone or expressing their own personal opinion or view	Reading Bleed Through by Adriana Arrington - this is one tough read #Schizophrenia	@donnabrazile and, now he's using the moab to divert attention w NKorea. #psychosis ya think?
Attitude - choose any, rate confidence 0-4 (more than one may apply)			
Stigmatising	A tweet that expresses a negative attitude toward schizophrenia or psychosis	As a woman, I'm laughing at this, because I think these things are only things you've ever heard inside your own head #Schizophrenia much?	@realDonaldTrump Your level of #psychosis and #sociopathic tendencies is truly the only way you sleep at night
Personal experience of stigma	The user describes a personal experience of being stigmatised because of schizophrenia or psychosis	Being #Schizophrenic, on a down phase, relating traumas to therapist, they like to tell me I'm a coldblooded emotionless sociopath.]No! #Bipolar	Moving account of how an experience of #psychosis and the #stigma that surrounds it, changed a life forever https://t.co/yjkg3qAVbS
Supportive	The tweet is ***unambiguously*** supportive to those with schizophrenia or psychosis	I love the insight into #psychosis wish everyone suffering could have access to	Ty for your kindness. I also want to send love and support to all those suffering

		successful treatment #moneyformentalhealth	#schizophrenia or #SchitzoAffectve as well as family members
[b]Neutral or possibly supportive	There is a neutral, or ***possibly*** supportive attitude	n/a	Let's do a Scottish sequel: Surviving #Psychosis https://t.co/IGufn98Wz9
Anti-stigma	The tweet promotes a reduction in stigma toward those with schizophrenia or psychosis	@pfrench123 Always great to see novel and engaging ways to break down #stigma in #psychosis. We hope the project does very well	MIND MATTERS: Mental illness doesn't always lead to #violence https://buff.ly/2hsyzBn #schizophrenia #bipolar #treatment #getthefacts
If category (c) indicated stigma, rate stigma type. Choose any, rate confidence 0-4 (in some cases, more than one category may apply)			
Social distancing	The user expresses the wish to have no contact with someone with schizophrenia or psychosis	#IfYouSeeMeInRealLife you're not a schizophrenic. If not go to your nearest psychiatrist now! #Schizophrenia #MentalHealthAwareness	n/a
Dangerousness	The user implies that someone with schizophrenia or psychosis is dangerous and may cause harm	Schizophrenic Canadian who beheaded bus passenger walks free, won't be monitored http://medicalnews.drifterup.com/News/Details/40640 ... #Schizophrenia @MedicalNewsLH	Any excuse for #war. #American politics has truly been taken over by #psychotic #warmongers at the detriment to #humanity. #HandsOffSyria
'Snap out of it'	The user implies that the person with schizophrenia or psychosis can 'snap out of it' by choice	n/a	n/a
Personal weakness	The user implies that schizophrenia or psychosis are because of personal weakness	n/a	n/a
Inaccurate beliefs	The tweet indicates the user has a lack of knowledge or inaccurate beliefs about schizophrenia or psychosis (e.g., references split personality)	The US Government is a split personality... #Schizophrenia	@ddanielsen you did all you could @F1abraham can't be fixed, there's no fixing a person who is that #psychotic. @MTV you made her fix it

[b]Conspiracy theories	The tweet is primarily about a conspiracy theory linked to schizophrenia or psychosis (e.g., mass psychosis)	n/a	n/a
Mocking or trivialising	(a) The user is rude, insulting or trivialising toward someone with schizophrenia or psychosis; (b) The user uses schizophrenia or psychosis as an insult	Some people follow you, when you follow back, they unfollow. #Twitter #schizophrenia	@Pamela_Moore13 What kind of drugs is this POS on #psychotic
Self-stigma	The tweet implies the user has internalised a stigmatising attitude toward schizophrenia or psychosis	I'm going mad today though I've been officially diagnosed as a crazy person. Schizophrenia is a real downer #Schizophrenia #hearingvoices	I think I'm starting to realize that everyone around me is a lot more in touch with reality than I am. #psychosis #mentalillness

[b]Overall confidence in rating (0-4). Note: Tweets with an overall confidence rating of ≤ 2 will be excluded from the analysis

The rater should rate their overall confidence in their rating/categorisation of the Tweet (0-4 scale):

- 4 = category clearly relevant and applies to this Tweet
- 3 = probably relevant and applies, but some doubt as to context or intended meaning
- 2 = may apply, but significant uncertainty as to meaning
- 1 = probably does not apply
- 0 = not relevant and does not apply

[a]Example Tweets taken from: Passerello, G., Hazelwood, J., & Lawrie, S. (2019). Using Twitter to assess attitudes to schizophrenia and psychosis. BJPsych Bulletin, 43(4), 158-166. https://doi:10.1192/bjb.2018.115. In accordance with the study ethical approval processes, we have not included quote Tweets from this study due to the risks of Tweets being able to be traced and linked to the identity of the original author.

[b]Amendments made to Passarello et al.'s coding framework (i.e., where additional categories were added).

Appendix G: Category-Specific Agreement for Inter-Rater Reliability (CT & LM)

Category	Term				Overall agreement (across terms)
	Psychosis	Psychotic	Schizophrenia	Schizophrenic	
Exclusion	96% 24/25	88% 22/25	92% 23/25	80% 20/25	88% 88/100
User Type	85.7% 18/21	100% 22/22	95.2% 20/21	94.7% 18/19	93.9% 78/93
Tweet Content	76.2% 16/21	95.5% 21/22	85.7% 18/21	73.7% 14/19	83.1% 69/83
Attitude	52.4% 11/21	81.8% 18/22	76.2% 16/21	79% 15/19	75% 60/80
Stigma Type	66.7% 4/6	88.2% 15/17	87.5% 7/8	87.5% 7/8	85% 34/40

Note. Percentages refer to basic agreement. One hundred Tweets (25 per condition) were randomly selected for inter-rater reliability coding.

Appendix H: Academic Research Access Approval from Twitter

From: Twitter Developer Accounts <developer-accounts@twitter.com>
Sent: 06 November 2022 08:44
To: Claire Thirkettle (MED - Postgraduate Researcher) <C.Thirkettle@uea.ac.uk>
Subject: Academic Research Access Application Approved

Developer

Academic Research Access Application Approved

Hello,

We're happy to let you know that your application for Academic Research access to the Twitter API has been approved! Your current access to the Twitter API will not be affected by this decision.

Please complete your Academic Project setup on the Twitter developer portal as soon as possible to begin utilizing your new access.

Thanks,

The Twitter Developer team

Appendix I: Ethical Approval From the University of East Anglia Faculty of Medicine and Health Sciences (FMH) Research Ethics Committee

From: Ethics Monitor <no-reply@ethicsreview.uea.ac.uk>

Sent: 03 April 2023 14:48

To: Claire Thirkettle (MED - Postgraduate Researcher) <C.Thirkettle@uea.ac.uk>

Subject: Decision - Ethics ETH2223-0645 : Miss Claire Thirkettle

University of East Anglia

Study title: Using Twitter to compare attitudes towards schizophrenia and psychosis: Investigating the prevalence of stigma.

Application ID: ETH2223-0645

Dear Claire,

Your application was considered on 3rd April 2023 by the FMH S-REC (Faculty of Medicine and Health Sciences Research Ethics Subcommittee).

The decision is: **approved**.

You are therefore able to start your project subject to any other necessary approvals being given.

If your study involves NHS staff and facilities, you will require Health Research Authority (HRA) governance approval before you can start this project (even though you did not require NHS-REC ethics approval). Please consult the HRA webpage about the application required, which is submitted through the IRAS system.

This approval will expire on **31st March 2024**.

Please note that your project is granted ethics approval only for the length of time identified above. Any extension to a project must obtain ethics approval by the FMH S-REC (Faculty of Medicine and Health Sciences Research Ethics Subcommittee) before continuing.

It is a requirement of this ethics approval that you should report any adverse events which occur during your project to the FMH S-REC (Faculty of Medicine and Health Sciences Research Ethics Subcommittee) as soon as possible. An adverse event is one which was not anticipated in the research design, and which could potentially cause risk or harm to the participants or the researcher, or which reveals potential risks in the treatment under

evaluation. For research involving animals, it may be the unintended death of an animal after trapping or carrying out a procedure.

Any amendments to your submitted project in terms of design, sample, data collection, focus etc. should be notified to the FMH S-REC (Faculty of Medicine and Health Sciences Research Ethics Subcommittee) in advance to ensure ethical compliance. If the amendments are substantial a new application may be required.

Approval by the FMH S-REC (Faculty of Medicine and Health Sciences Research Ethics Subcommittee) should not be taken as evidence that your study is compliant with the UK General Data Protection Regulation (UK GDPR) and the Data Protection Act 2018. If you need guidance on how to make your study UK GDPR compliant, please contact the UEA Data Protection Officer (dataprotection@uea.ac.uk).

Please can you send your report once your project is completed to the FMH S-REC (fmh.ethics@uea.ac.uk).

I would like to wish you every success with your project.

On behalf of the FMH S-REC (Faculty of Medicine and Health Sciences Research Ethics Subcommittee)

Yours sincerely,

Dr Paul Linsley

Ethics ETH2223-0645 : Miss Claire Thirkettle

Appendix J: Confidence Ratings in Classification of Stigmatising Tweets (CT)

Confidence rating	Term			
	Psychosis	**Psychotic**	**Schizophrenia**	**Schizophrenic**
4 - category clearly relevant and applies to this Tweet	51% 26	59% 59	40% 10	50% 32
3 - probably relevant and applies, but some doubt as to context or intended meaning	31.4% 16	28% 28	40% 10	39.1% 25
2 - may apply, but significant uncertainty as to meaning	17.6% 9	13% 13	20% 5	11% 7
1 - probably does not apply	-	-	-	-
Total number of stigmatising Tweets	51	100	25	64