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Psicothema

PUBLICATION GUIDELINES

Psicothema publishes empirical work in English which is done with methodological rigor and which contributes to the progress of any field of scientific psychology. As an exception, the Editorial Board may accept publication of work in Spanish if the content justifies such a decision. Theoretical work may also be accepted, if requested by the Editorial Board, with preference given to articles that engage with critical research issues or which discuss controversial approaches.

Submission of articles

1. Articles should be submitted via the journal's web page: www.psicothema.com (Authors section – submission of articles): http://www.psicothema.es/submit

2. Submissions must comply with the rules for preparation and publication of articles, as well as the ethical standards specified below.

3. Studies must be unpublished. Articles which have been fully or partially published elsewhere will not be accepted, nor will articles that are in the process of publication or which have been submitted to other journals for review. It will be assumed that all those who appear as authors have agreed to do so, and all those cited for personal correspondence have consented.

4. The activities described in the published articles will comply with generally accepted ethical standards and criteria, both in terms of work with human beings and animal experimentation, as well as all aspects of professional and publishing ethics.

5. The original work may be submitted in Spanish initially and receipt will be acknowledged immediately. If so, and if it is accepted, the authors will be responsible for translating it into English for publication.

6. Authors may only submit one article for consideration by Psicothema per year.

7. Names and surnames should be entered on the platform in the form they will be cited (a single surname, two separate surnames, hyphenated surnames, etc.). The affiliation of all authors must be indicated. **A maximum of two affiliations per author may be indicated. Affiliations must follow the format "entity or university (country, in English)"**. Do not include information about research groups or departments. Only one person may appear as corresponding author, who will be responsible for ensuring that the author names, order, and affiliations are correct.

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9. Manuscripts are screened by the Editorial Board to assess relevance and interest for the journal and whether it follows the rules. Articles must faithfully conform to the editorial rules and fall within the editorial scope of the journal. It is a necessary, though not sufficient, condition that articles must comply with the rules for publication. Articles which do not follow Psicothema's rules will be rejected. In general, within around 10 days the Editorial Board will communicate a decision of interest to begin the review process.

10. Psicothema is only able to publish about 10% of the manuscripts it receives, which is why we apply a very rigorous screening and selection system. Many submissions are considered **non-priorities** by the Editorial Board without being sent for review.

11. If an article passes the Editorial Board screening, it will be sent to a minimum of two reviewers to evaluate its scientific quality. The journal has a **policy of "double blind" reviews**, meaning that both authors and reviewers are anonymous during the review process. To that end, manuscripts must not contain information that would allow the authors to be identified. Most reviewers report back within the agreed three week period. The review process, from receiving an article to the decision to modify it or reject it, usually takes around two months.

12. If, after receiving the reviewers' reports, the Editorial Board decides that the article needs "modifications" to be published, the authors should send the modifications in the requested format together with a point-by-point response to all the comments made by the reviewers and the Editorial Board. Failure to respond in the required format within the set timescale will lead to the article being rejected and removed from the management platform, with no possibility of re-submission.

13. The Editorial Board is responsible for the final decision to accept the article for publication or not. The editors usually make their decisions as quickly as possible once they have received all the necessary reports.

14. After an article has been accepted, and before publication, the authors must sign a copyright agreement. Printing rights and rights of reproduction in any format or medium belong to Psicothema, who will not reject any reasonable request from authors for permission to reproduce their contributions.

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For any questions or clarifications, the journal can be contacted via the email address psicothema@cop.es

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1. File format: Articles must be sent in DOC or DOCX format. Microsoft Word documents must not be locked or password-protected, they should not have comments in the margins or information that might reveal the authors' identities. The file should be anonymised in "file properties" so that author information does not appear.

2. Length: The maximum length for articles is **6,000 words** (including the title, abstracts, key words, in-text references, acknowledgements, figures, and tables). The 6,000 word limit **does not include the list of references**. If authors wish to provide supplementary material, the article should include a unique, persistent web link (see point 18 about supplementary material).

3. Format: The articles must be in Microsoft Word format, using **12-point Times New Roman**, in a single column with 3 cm margins, paragraphs left-aligned and double spaced (except for tables and figures which may use single spacing). Page numbers must be included in the lower right corner. Limit sections and subsections to three levels of headings and follow the recommendations in the APA 7th edition about "Sentence case" in the list of references. Psicothema does not allow footnotes, annexes, or appendices. Any such content should be incorporated appropriately into the text (see point 18 about supplementary material).

4. Language: Although articles may be submitted and reviewed in Spanish, accepted articles are usually published in English. Once articles are accepted, the authors must provide an English translation of the reviewed article, within the indicated timeframe, for publication. Psicothema accepts American and British English, but not a mix of the two. Any text in English must be of appropriate professional quality, which will be reviewed by a professional native-speaking translator. Following that review, Psicothema may suggest changes, or if necessary, request a new translation or revision of the translation, the costs of which will be borne by the article's authors.

5. Title page: The first page of the article contains the article title in English and in Spanish, the running title (in English), the total number of words

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7. **Abstracts and key words:** the second page of the article contains the abstracts (in Spanish and English) and 3-5 key words or terms. Abstracts must be no more than 200 words and **structured** in four sections: Background, Method, Results, and Conclusions. The abstract should be a single paragraph with these titles in bold, followed by colons and upper case. The key words cover essential elements of the paper such as the research topic, population, method, or application of the results. Avoid general terms and empty words (pronouns, adverbs etc.), or redundant words such as analysis, description, research, etc. Nouns are preferred. Pay particular attention to selection of key words as they are used to index the article.

8. **Article:** The article introduction begins on the third page. The introductory section should not include the article title, or the subtitle "Introduction", or subsections. Following that, the "Method" section should contain the following subsections "Participants", "Instruments", "Procedure", and "Data Analysis", and no others, in no other order, and with no other titles. Where appropriate, in the procedure section it is obligatory to provide information about ethical aspects of the study, the ethics committee that approved the study and the reference code (anonymized during the review process). For research with children, express mention must be made about obtaining informed consent. Pay particular attention to the APA rules about the presentation of statistical and mathematical results in the text, as well as tables and figures. At the end, there should be a single "Discussion" section which should include both discussion along with limitations and conclusions of the study. The discussion section should not have any subsections.

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   If a group of authors made equal contributions, please also use the CRediT taxonomy to specify their contributions: **John White:** Conceptualization, Writing – Original draft, Writing - Review and Editing. **Lucinda Jackson:** Conceptualization, Writing – Original draft, Writing review and Editing.

   Psicothema does not permit the use of other formulas to indicate equal contributions, such as 'contributed equally to this work ', co-first authors, co-last authors, or co-senior authors.

10. **Corresponding author:** Psicothema allows only **one corresponding author**, who will take primary responsibility for communication with the journal during the manuscript submission, peer review, and publication process, as well as for ensuring providing correct details of authorship (including the names of co-authors, addresses and affiliations), ethics, acknowledgements, sources of funding, conflict of interests, and declarations. The corresponding author is responsible for having ensured that all authors have agreed to be so listed, and have approved the manuscript submission to the journal. After publication, the corresponding author is the point of contact for queries about the published paper. It is their responsibility to inform all co-authors of any matters arising in relation to the published paper and to ensure such matters are dealt with promptly.

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13. **Conflict of interests:** Authors must report any economic or personal relationship with other people or organizations that may inappropriately influence their work. If there are none, following the funding section, in a section titled "Conflict of Interest", authors should state: "The author(s) declare(s) that there are no conflicts of interest".

14. **Declaration of availability of data:** The authors should state, in a section titled "Data Availability Statement", whether the research data associated with the article is available and where or under what conditions it may be accessed. They may also include links (where appropriate) to the dataset.

15. **Reference style:** Articles must be written following the guidelines in the 7th edition of the Publication Manual of the American Psychological Association. Articles that do not comply with these rules will be rejected. Some of the requirements are summarized below.

Bibliographical references in the text should include the author's surname and year of publication (in brackets, separated by a comma). If the author's name forms part of the narrative, it should be followed by the year in brackets. If there are more than two authors, only the first author's surname is given, followed by "et al." and the year; if there is confusion, add subsequent authors until the work is clearly identified. In every case, the references in the bibliography must be complete (up to 20 authors). When citing different articles in the same brackets, order them alphabetically. To cite more than one study from the same author or authors from the same year, add the letters a, b, c, as necessary, repeating the year (e.g., 2021a, 2021b).

The list of references at the end of the article must be alphabetical and comply with the following rules:

a) Books: Author (surname, comma, initials of first name(s) and a full stop); if there are various authors, separate them with a comma; before the final author use a comma and "&"; year (in brackets) and full stop, The full title in italics and full stop; finally, the publisher. For example:

Lezak, M., Howieson, D. B., & Loring, D. W. (2004). *Neuropsychological assessment* (4th ed.). Oxford University Press.

b) Chapters of books with various authors, reports from conferences or similar: Author(s); year; title of the work being cited, followed by "In", the director(s), editor(s), or compiler(s) and in brackets Ed., adding an s if plural; the title of the book in italics and in brackets the page numbers of the cited chapter; the publisher. For example:

de Wit, H., & Mitchell, S. H. (2009). Drug effects on delay discounting. In G. J. Madden & W. K. Bickel (Eds.), *Impulsivity: The behavioral and neurological science of discounting* (pp. 213-241). American Psychological Association.

c) Journal articles: Author(s); year; article title; full name of the journal in italics; volume number in italics; issue number in brackets with no space between it and the volume number; first and last page number. The doi should be included in URL format. For example:

Muñiz, J., & Fonseca-Pedrero, E. (2019). Diez pasos para la construcción de un test. *Psicothema, 31*(1), 7-16. https://doi.org/10.7334/psicothema2018.291

For documents that do not have a doi, it is no longer necessary to use "Retrieved from", instead give the URL directly. For example:

Walker, A. (2019, November 14). *Germany avoids recession but growth remains weak*. BBC News. https://www.bbc.com/news/business-50419127

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e) When the original version of the cited work (book, chapter, or article) **is not in English**, cite the original title and give the English translation in square brackets (with no separation from the original, without using italics).

For further information and other cases, consult the 7th edition of the APA publication manual or the following page: https://apastyle.apa.org/style-grammar-guidelines/references/examples

16. Figures and tables should be included at the end of the manuscript, one per page. They should also follow the APA 7th edition guidelines, be appropriately numbered and cited in the text, indicating approximately where they should be placed. They must have a short, descriptive title that helps understand the content, and follow the APA recommendations about title case, with no full stop. They should be 7 or 14 cm wide and have clear, legible lettering and symbols. Avoid wasted space and make best use of the space available. Figures must be submitted in editable formats, consistent with the format of the rest of the article. If that is not possible, they must have a minimum resolution of 300ppp.

17. Pre-registration of studies and plans of analysis: as a general rule, Psicothema recommends pre-registering submitted studies. If authors have pre-registered studies or plans of analysis, links to that pre-registration should be provided in the article.

18. Supplementary material. Psicothema recommends sharing the data that has been used in the research and supplementary material in institutional or thematic open-access repositories, federated in the European Open Science Cloud (EOSC). Provide a web link if access is to be provided to databases or any other supplementary material, using unique, persistent identifiers.

19. We encourage authors to consult the following standard guidelines when preparing their manuscripts (although due to the multidisciplinary nature of the journal, this is not obligatory):

Case Reports - **CARE**

Diagnostic accuracy - **STARD**

Observational studies - **STROBE** (von Elm et al., 2008), **MQCOM** (Chacón et al., 2019) o **GREOM** (Portell et al., 2015)

Randomized controlled trial - **CONSORT** and **SPIRIT** (Hopewell et al., 2022)

Systematic reviews, meta-analyses – **PRISMA** (Page et al., 2020)

Test adaptation - **International Test Commission Guidelines** (Hernández et al., 2020)

Test development - **Ten steps for test development** (Muñiz & Fonseca, 2019)

Publication of articles

1. Publication rates: Psicothema is an **"open access"** journal. All of the articles will always be free to those who want to read or download them. In order to provide this open access, Psicothema charges a publication fee which the authors or their funders must pay. The price depends on the length of the manuscript. In general, the average price per article is between €180 and €210, based on a mean of 6-7 pages per article, at €30 per laid-out page.

2. Print Proofs: Once an article has been accepted for publication, the contact person will receive an email with the print proofs in PDF format to check and correct spelling-typographical errors. Only minimal corrections can be made to the content of the article once it has been accepted. **Substantial modifications and changes will not be accepted** other that correcting printing or translation errors, possible errors detected during the review process, or incorporating suggestions made by the Editorial Board. No changes will be accepted in this phase to authorship, addition of new affiliations, or details such as including research groups or departments. Galley proofs should be checked carefully, following the instructions provided with them, to confirm that they match the accepted original. Corrected proofs should be returned within the requested timeframe (48-72 hours). Corrections must be made in the PDF file itself, no other means of correction will be accepted. It is vital to check that names, surnames, ORCID codes, and affiliations are all correct in this stage. The corresponding author is responsible for gaining approval from all co-authors for the corrected print proofs. If the proof article is not reviewed within the timeframe or manner specified, that version of the article will be published and subsequent changes or corrections will not be possible.

3. Published version: Once the edition of Psicothema containing the article is published, the author will receive a copy of their article in PDF format. The final version typeset by Psicothema will be available online via DOI. We strongly recommend sharing the final version published by Psicothema on social networks, (Facebook, Twitter, LinkedIn…), university and public repositories (Mendeley, Cosis…), scientific social networks (ResearchGate, Academia.edu, Kudos ...), personal and institutional websites, blogs, Google Scholar, ORCID, Web of Science ResarcherID, ScopusID...

Ethical standards

Psicothema is committed to the scientific community to ensure the ethical and quality standards of published articles. Its references are the "Core practices" defined by the **Committee on Publication Ethics (COPE)** for journal editors, the **American Psychological Association (APA)** Code of Conduct, and the Code of Ethics for Psychology from the **Spanish General Council of Psychology**.

Use of inclusive, non-sexist language. At Psicothema, we are firmly committed to equality and respect for all, recognizing and appreciating diversity. For this reason, authors should ensure that they use bias-free language, avoid stereotypes, and engage with inclusive, non-sexist language, albeit prioritizing grammatical correctness, economy of language, and accuracy, given the limitations of space. Pay particular attention to the presentation of data, so that participants' characteristics are described and analysed properly, without presenting information that is irrelevant to testing hypotheses, achieving objectives, or presenting results of the study. Avoid condescending, obsolete, or inappropriate language, as well as the use of labels related to stereotypes. We recommend reporting where potential gender differences are found in the results.

Responsible authorship. Psicothema promotes transparency via the declaration of authors' contributions. All signatories must have made substantial contributions in each of the following aspects: (1) conception and design of the study, or data acquisition, or analysis and interpretation of data, (2) drafting the article or critical review of the intellectual content, and (3) final approval of the submitted version. The list and order of authors should be carefully reviewed before the initial submission of the article. Any addition, removal, or re-ordering must be done before the article is accepted, with the approval of the Psicothema Editorial Board and the consent of all named authors. A form for this is available on request.

Open science. To facilitate the reproducibility of research and reuse of data, code, types of software, models, algorithms, protocols, methods, and any other useful material related to the project should be shared.

We recommend that authors publish the original study data in public open-access repositories online, such as FigShare (http://figshare.com), Mendeley Data (https://data.mendeley.com/), Zenodo (http://zenodo.org/), DataHub (http://datahub.io) and DANS (http://www.dans.knaw.nl/). Where data or supplementary material is shared, a corresponding reference should be included in the manuscript and the list of references, using unique, persistent identifiers.

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San Francisco declaration on research assessment (DORA). As part of its commitment to open knowledge, Psicothema follows this initiative because it shares the need to address the quality assessment of scientific articles (not only the journals in which they are published), to consider the value and impact of all research outputs (including data and software), and to consider the societal impact of research from a broader perspective (including qualitative indicators, such as the influence on scientific policies and practices, together with a responsible use of quantitative indicators). To this end, it is committed to remove restrictions on the number of references that can be included in the bibliography, not counting them as part of the maximum number of words, to encourage responsible authorship practices and to provide information about the specific contributions of each author (CRediT), to mandate the citation of primary literature in favor of reviews in order to give credit to the group(s) who first reported a finding, and to make available a variety of journal-based metrics and article-level metrics (PlumX).

Good publishing practice in gender equality. Psicothema is committed to gender policies that lead to real equality between men and women in society through various actions: (1) pursuing equal proportions of women and men in the editorial team, as well as in those who review the articles; (2) recommending the use of inclusive language in scientific articles; (3) recommending that articles report whether the original study data considered sex or gender in order to identify possible differences; and (4) including the full names of the authors of published articles. To that end, authors must include their full names (not just first initials) in the metadata, which will appear in the published articles.

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Acknowledgement of receipt. Receipt of the article will be immediately communicated to the authors by email.

Screening. Articles will be reviewed by the Editor-in-Chief, Executive Editor, Managing Editor, and the Associate Editors. The editorial team may directly reject studies if, in their opinion, they do not follow the journal's publication rules, do not meet the minimum requirements, or do not fit the journal's objectives or priorities.

Review. Once past the Editorial Board screening, the articles will be reviewed by external reviewers and by the Associate Editor responsible for managing the article. The Associate Editor and the Managing Editor will consider the external reviewers' reports and will make the final decision on publication.

Reasoned reply. Except in cases of articles considered to be "non-priority" in the initial screening phase, authors will be given a reasoned response about the Editorial Board's final decision when that involves rejection (i.e., articles rejected after the peer review phase).

Confidentiality. Authorship of articles received will be kept anonymous and the evaluation process will be confidential, we commit to not disseminating the article more than necessary for the evaluation process and until the article is accepted for publication.

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Suspicion of a breach of ethics. Reviewers will inform the Editorial Board if they detect poor practice, fraud, plagiarism, or self-plagiarism, as well as any other irregularity related to research or publication ethics.

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Preparation of the report. The format of Psicothema's review report is open, but reviewers must use a short scoring rubric. Reviewers must be objective and constructive in their reviews, offering feedback that will help authors improve their articles. Reviewers must make fair, impartial, constructive assessments of the article's strengths and weaknesses, and avoid disparaging personal comments or baseless accusations. They must not suggest that authors add references to the reviewer's own work (or that of colleagues) just to increase the number of citations or raise the visibility of their work or the work of associated; suggestions must only be based on valid academic reasons.

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The Editorial Board is not responsible for the ideas or opinions expressed by the authors in the journal articles or the reviewers in their reports. The opinions and facts expressed in the articles are solely and exclusively the authors' responsibility and do not represent the journal's opinions or scientific policies. The editorial organization is not responsible in any case for the credibility or authenticity of the articles.

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The readers' rights

Readers have the right to read all articles published in Psicothema for free immediately after their publication.

Updating published articles

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Minor errors. Minor errors that do not affect the readability or meaning, such as spelling, grammar, or layout mistakes are not sufficient for and do not justify an update, regardless of the source of the error.

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Article

Comprehensive Assessment of Mental Health Stigma

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ABSTRACT

Background: Mental health (MH) stigma is one of the main barriers to young people with MH problems seeking help. This study attempts to analyse it using the Stigma and Self-Stigma scales (SASS) in a representative sample of young people, novel aspects being the comprehensive perspective of the instrument used and the analysis of gender effects, both from a psychometric perspective (measurement invariance) and analysis of the differences according to the gender variable. **Method**: 378 students (M = 20.78 years; SD = 1.65; 61.6% women) participated, selected through a stratified random cluster sampling approach. The scale's internal structure and its measurement invariance between genders were examined. **Results**: The five-factor model of the SASS showed adequate goodness-of-fit indices. Scalar invariance between genders was confirmed for the five-dimensional model, along with higher levels of stigma in several dimensions among boys. Cronbach's α for the different subscales ranged from .62 to .80, and McDonald's ω from .60 to .79. **Conclusions**: The SASS is a brief, simple, and reliable instrument for assessing different dimensions of MH stigma in university settings.

Evaluación Comprensiva del Estigma en Salud Mental

Palabras clave:
Estigma en salud mental
Diferencias de género
Invarianza de medida
Estudiantes universitarios
SASS

RESUMEN

Antecedentes: El estigma en salud mental (SM) supone una barrera para la búsqueda de ayuda entre jóvenes ante problemas de SM. Este estudio lo analiza mediante la *Stigma and Self Stigma scales* (SASS) en una muestra representativa de jóvenes, siendo novedosa la perspectiva comprehensiva del instrumento utilizado y el análisis de los efectos del género, tanto desde el enfoque psicométrico (invarianza de la medida) como desde el análisis de las diferencias en función de esta variable. **Método**: 378 estudiantes (M = 20.78 años; SD = 1.65; 61.6% mujeres), seleccionados mediante muestreo aleatorio estratificado por conglomerados, participaron en el estudio. Se examinaron la estructura interna e invarianza de medida en función del género. **Resultados**: El modelo de cinco factores relacionados mostró índices de bondad de ajuste adecuados. Se confirmó la invarianza escalar en función del género para el modelo pentadimensional y la presencia de niveles más altos de estigma en diversas dimensiones en los chicos. El α de Cronbach para las diferentes subescalas varió de .62 a .80 y el ω de McDonald de .60 a .79. **Conclusiones**: El SASS es un instrumento breve, sencillo y fiable para evaluar diferentes dimensiones del estigma en SM en contextos universitarios.

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Recent studies have increasingly identified the negative effects of stigma on mental health (MH) and people with MH problems (Chukwuma et al., 2024; Mak et al., 2007; Prizeman et al., 2023). Although progress has been made in the field of stigma awareness, there is still a need to dedicate resources to research on the factors that contribute to stigma in order to understand it and improve interventions to address it (Shannon et al., 2020). People with MH problems are a part of society and represent a reflection of its state (Gumus & Avci, 2024). The concept of stigma is intricately linked to that of MH (Zayts-Spence et al., 2023). Consequently, stigma related to MH is a significant global challenge (Abi Hana et al., 2022; Scerri et al., 2023), as it constitutes a major barrier to help-seeking and treatment (Abdelmonaem et al., 2024; Dobransky, 2020; Ferreira-Rodrigues et al., 2025; Paíno et al., 2022). Moreover, the extent and intensity of the MH problems are influenced by sociocultural factors (Ausín et al., 2022; Scerri et al., 2023).

Stigma associated with MH problems or their symptoms encompasses various aspects, including social judgment, degradation, and devaluation of individuals experiencing these challenges (Abdullah & Brown, 2011). Following the investigation of Corrigan et al. (2014), stigma can be classified into three primary types: public stigma, self-stigma, and structural stigma. Public stigma refers to the societal endorsement of negative stereotypes, leading to discrimination against individuals with MH problems. Self-stigma occurs when individuals with MH conditions internalize these prejudices. Lastly, structural stigma manifests in social and institutional policies and practices that restrict opportunities and resources for individuals with MH problems.

Additionally, the beliefs related to MH problems can be presented in many ways, all of which are key to a proper analysis of MH stigma and are described in the following lines (Gray et al., 2023). The first type is stigma towards others or perceived stigma, which refers to the negative beliefs that a person holds in relation to others with MH problems (Pompeo-Fargnoli, 2020), the problems themselves or the use of MH services, all of which are influenced by the social environment (Drent et al., 2022). Social distance encompasses more affective dimensions of stigma, determining the acceptance of people with MH problems within their own community (Martin et al., 2000). Anticipated stigma measures people's thoughts about what the rest of society would think if they had a MH problem (Link, 1987). Self-stigma or personal stigma refers to a person's own thoughts about themselves if they have or were to have a MH problem (Pompeo-Fargnoli, 2020). Some authors also establish the necessity to include between these dimensions the avoidant coping strategies and stigma related to help-seeking behaviours, due to their relevance in the construct of one's MH stigma. The first is characterized by the intentional disregard of one's own difficulties or the inappropriate use of coping strategies in response to challenges, such as substance use, engagement in avoidant or distracting activities, denial, or emotional distancing (Anderson et al., 2024; Fernández-Calderón et al., 2022; Fluharty et al., 2021). Finally, stigma related to help-seeking attitudes reflects individuals' reluctance to acknowledge their difficulties or seek assistance for a MH condition, both from professionals and within their social environment (Goodfellow et al., 2022).

Stigma plays a key role in the social treatment of people with MH problems, affecting at personal, physical, emotional, occupational, familial, and academical spheres (Corrigan et al., 2006; Gumus & Avci, 2024), potentially culminating in instances of social discrimination (Link & Phelan, 2001; Zhang et al., 2020). Moreover, stigma has a negative influence on people with MH problems by reducing help-seeking and treatment adherence (Corrigan et al., 2006; Dobransky, 2020; Dubreucq et al., 2021; Gumus & Avci, 2024). Primarily, stigma has a direct impact on self-esteem, which can result in some people feeling shame about having a MH problem (Corrigan et al., 2006; Corrigan et al., 2014) or that a family member has one, as well as worry and fear (Dobener et al., 2022), which in turn can lead to the concealment of one's own MH problem (Wang, 2022). Furthermore, there are also negative effects on self-efficacy and self-respect, which can lead to a reduction in resilience (Oexle et al., 2018). The strong correlation between stigma and the development of depression and suicidal ideation is well-documented, so it is important to assess and address stigma in order to reduce its negative effects (Al-Halabí & Fonseca-Pedrero, 2024; Dubreucq et al., 2021; Ward-Ciesielski et al., 2019).

It has been estimated that approximately one quarter of the global population has or will have a MH problem in their lifetime (Nigussie et al., 2023), with the university period being the most significant to its development in more than one quarter of the student population (Leow et al., 2024), which may have repercussions in their future (Grandón et al., 2022; Leow et al., 2024). However, despite the implications mentioned above, there is a certain level of lack of knowledge about stereotypes and prejudices in relation to MH among university students (Ruiz et al., 2022). This can influence students' attitude towards help-seeking (Estupiñá et al., 2024; Kuhlman et al., 2018), as well as showing stigma towards people with MH problems (Ruiz et al., 2022). University plays a pivotal role in raising awareness of MH and demystifying misconceptions surrounding its problems, as it is the final formal educational setting responsible for shaping societal attitudes (Grandón et al., 2022). This highlights the necessity to conduct research into the study of MH stigma at the university stage.

To date, there has been a scarcity of studies that have undertaken a comparative analysis between different university degrees about stigma in MH (Ruiz et al., 2022), being difficult to integrate the entire university population beyond the healthcare field (Chen et al., 2020; Madi et al., 2025; Topkaya, 2021). The majority of these studies focus exclusively on stigma towards others, as evidenced by the work of Sum et al. (2024), who found that elevated levels of stigma are negatively correlated with help-seeking behaviours. In addition, Puspitasari et al. (2020) observed that individuals' contact with MH problems, their experience of help-seeking, and their knowledge of MH problems were all associated with lower levels of stigma. Other studies, such as Al Omari et al. (2021), assessed stigma towards others and self-stigma dimensions, among its results showing that university students exhibited higher levels of stigma in both compared to adolescents. Maeshima and Parent (2022) and Kim and Yon (2019) have analysed these aspects in relation to help-seeking behaviours, with these former studies finding low levels of help-seeking in cases of self-stigma, the latter study identifying a high positive correlation with stigma toward others. In contrast, Shannon et al. (2022) conducted a study exclusively with boys, showing that stigma towards others serves as a stronger predictor of help-seeking compared to self-stigma. Similarly, Chen et al. (2020) identified stigma as a significant barrier to help-seeking among European-American populations.

Regarding gender differences, in most of the studies cited it was displayed that women exhibited lower scores concerning stigma (Al Omari et al., 2023; Dagani et al., 2023; Sum et al., 2024). It is important

to state the lack of studies that evaluate measurement invariance across gender in MH stigma in general population, especially among Spanish students and with Spanish instruments, knowing its relevance for investigation purposes in MH stigma (Sanabria-Mazo et al., 2023). The measurement invariance is necessary to establish comparisons between groups. In general, most studies evaluate the invariance regarding to relatives of individuals with MH problems (Trigueros et al., 2019), culture (Tisocco et al., 2024) or specifically a MH problem, such as eating disorders (Marek et al., 2023) and schizophrenia (Fonseca-Pedrero et al., 2011), but none about gender.

Assessing MH stigma is complex, as it involves measuring procedures that include different areas with interactive variables, as one's own etiological beliefs, attitudes, prejudices, personal and social issues towards people with MH problems and the person themselves, cultural aspects, treatment of MH problems and their causal beliefs, and the distinction between different types of disorders due to their specificity (Mannarini & Rossi, 2019). For this reason, many of the studies carried out at university level only analyse one specific aspect of stigma (Shannon et al., 2020), based on the use of instruments that measure social stigma (Vogel et al., 2009), self-stigma (Ritsher et al., 2003; Vogel et al., 2006), stigma related to help-seeking behaviours (Clement et al., 2012; Vogel et al., 2006), and with specific population, the most common being the health field (Gabbidon et al., 2013; Gaebel et al., 2011; Sastre-Rus et al., 2020). Other instruments analyse the main stigma dimensions related to personal and social stigma, without specifying any dimension that could influence the global stigma toward MH problems, as it is the case of Community Attitudes towards Mental Illness (Taylor & Dear, 1981) or Attitudes Towards Mental Health Problems (Gilbert et al., 2007) scales.

An instrument that adequately addresses the limitations stated above is Stigma and Self-Stigma scales (SASS) (Docksey et al., 2022), which makes a comprehensible approach to the fundamental dimensions of MH stigma, avoiding the excessive use of other instruments, which may lead to study dropout. This instrument showed good psychometric properties in the six-factors model among employees from the UK. The authors question the introduction of the Avoidant coping dimension in the final version. Also, internal consistencies were good for almost all the dimensions. In this regard, SASS displayed consistent results across the measures of MH. However, due to its recent publication, there is no information about its psychometric properties among university students. Also, even though SASS has been validated in previous studies, there is no psychometric evidence in the Spanish context to date.

Given the need to study the MH stigma in the university population, the main objective of this study was twofold: first, to examine the psychometric properties of the SASS scores in a representative sample of Spanish university students, and second, to analyse the influence of gender on the measurement of stigma. The specific aims were to: a) assess the internal structure of the SASS; b) analyse the correlations between the SASS dimensions; c) estimate the reliability of the SASS scores; d) evaluate the scale's measurement invariance by gender, and e) examine differences in stigma based on gender. It was hypothesized that the five-factor model of the SASS would have adequate goodness-of-fit indices, there would be found significant positive correlations between SASS factors, the reliability estimation of the SASS scores would be adequate, and the dimensional model would be invariant across gender.

Method

Participants

The initial sample compromised 381 students from the University of La Rioja (Spain). Participants were asked to indicate their gender and other sociodemographic data. Due to the lack of a minimum number of participants to form groups for non-binary and transgender individuals, three participants were eliminated from the final sample. The sampling method employed was a stratified random cluster sampling approach, utilising year and degree as primary sample units. To obtain the sample size, Slovin's formula was employed [$n = N/(1+Ne^2)$], with an estimation error of 5%. The minimum sample size needed was 349 participants, from a population of 3702 students distributed among the 19 degrees during the academic year 2023/2024 at the University of La Rioja.

The final sample consisted of 378 students. A total of 61.6% of the sample were women, with an average age of 20.78 years ($SD = 1.65$). The sample was proportional to the university population. For instance, 31.0% of the participants came from the Faculty of Letters and Education, and 32.3% were first-year students.

Instruments

Stigma and Self-Stigma Scales (SASS; Docksey et al., 2022). The SASS is an instrument developed to assess MH stigma and comprises 36 core items that evaluate different aspects of stigma, including: Stigma to others (SO), Social distance (SD), Anticipated stigma (AS), Self-stigma (SS), Avoidant coping (AC), and (lack of) Help-seeking behaviours (HS). Each subscale is composed by six items. The first two subscales are related to public stigma, the next two to personal stigma, and the last two analyse components that may influence people's level of stigma. Also, the scale includes a social desirability dimension, which was not used. Response options for each item range from 0 (*strongly disagree*) to 4 (*strongly agree*). This results in a minimum score of 0 points and a maximum of 24 per subscale. There is no cutoff point for the scores obtained, higher scores indicating greater presence of stigma towards MH.

Procedure

Permission was sought from the original authors of the scale, who authorised the adaptation of the test and its use for research purposes. The translation process for the SASS consisted of three phases (Hambleton and Kanjee, 1995; ITC, 2017; Martínez-Zambrano et al., 2016; Muñiz et al., 2013): a) translation from English to Spanish followed by back-translation carried out by experts with a high level of proficiency in both languages. The back-translation was very similar to the original version, with little discrepancies regarding aspects that did not affect the meaning; b) revision and evaluation of the final Spanish version performed by a group of MH experts, who determined whether the items could be readily understood, and c) implementation of the Spanish version. The Ethical Committee of the University of La Rioja approved this research.

The initial contact with university teachers was made via e-mail, to discuss the possibility to allocate time and develop the study during their classes, ensuring high participation. The instrument was administrated during university classes collectively, through

personal electronic devices. It was carried out by interviewers who had previously been trained by the research team. Participants were explicitly informed about the confidentiality of their responses and voluntary nature of the study. No incentive was provided for their participation. The research was presented to the participants as an investigation concerning their attitude towards MH. There was only anecdotal evidence of non-participation.

Data Analysis

There was no missing data, as the completion of all items of the questionnaire on the platform used was compulsory.

First, descriptive statistics, including means and standards deviations, were computed for the SASS questionnaire.

Second, several confirmatory factor analyses (CFAs) were performed to examine the internal structure of the scale. The one-factor model was tested in addition to the six- and five-dimensions model, based on Docksey et al. (2022). Because the items were measured on 5-point Likert scales and showed non-normal response distributions, the CFA was estimated using the Weighted Least Squares Mean and Variance adjusted (WLSMV) estimator. WLSMV is based on polychoric correlations and provides robust standard errors and adjusted fit indices in moderate sample sizes and models with multiple factors (Li, 2016; Rhemtulla et al., 2012). The following goodness-of-fit indices were used: Chi-square (χ^2), Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA) and 90% confidence interval, and Standardized Root Mean Square Residual (SRMR). An RMSEA of .06 or lower is considered a good fit and CFI and TLI values of .90 are considered acceptable for the model fit (Hu & Bentler, 1999). Regarding SRMR, values > .10 may indicate poor fit (Kline, 2016). Finally, the correlations between latent factors were analysed.

Third, reliability of the SASS scores were estimated using Cronbach's α and McDonald's ω (Dunn et al., 2014).

Finally, measurement invariance across gender was evaluated using a sequence of multigroup CFA models (Putnick & Bornstein, 2016; Sireci & Benítez, 2023). First, configural invariance was tested to verify whether the same factor structure held across groups. Next, metric invariance was examined by constraining factor loadings to equality, and scalar invariance was evaluated by additionally constraining item thresholds. The comparison between nested models was based on changes in CFI and RMSEA (ΔCFI < .010 and ΔRMSEA < .015), as recommended for ordinal indicators (Cheung & Rensvold, 2002; Rhemtulla et al., 2012). Only when scalar invariance was supported were latent mean comparisons conducted, since this level of invariance ensures that both the loadings and thresholds are equivalent across groups, allowing differences in latent means to be interpreted as substantive differences in the underlying construct.

The analyses were carried out using SPSS 28.0 (IBM Corp., 2021) and JASP 0.19.3.0 (JASP Team, 2025).

Results

Descriptive Statistics for the SASS Items

Descriptive statistics for the SASS items are shown in Table 1 (n = 378). The highest mean score was on item 15 (M = 2.61; SD = 1.21), and the lowest on item 16 (M = 0.35; SD = 0.78). There were several items that had skewness and kurtosis values outside the -1 to 1 range (e.g. items 16, 26 and 41).

Table 1

Descriptive Statistics of the Stigma and Self-Stigma Scales Items

	M_{Boys} (SD)	M_{Girls} (SD)	M (SD)	Skewness	Kurtosis
Stigma to others					
Item16	0.70 (0.99)	0.61 (1.00)	0.64 (0.99)	1.61	1.99
Item21	1.61 (1.13)	0.83 (1.01)	1.13 (1.12)	0.65	-0.55
Item25	0.97 (1.10)	0.72 (1.04)	0.81 (1.07)	1.24	0.70
Item26	0.50 (0.91)	0.26 (0.67)	0.35 (0.78)	2.63	7.32
Item31	1.53 (1.21)	1.27 (1.18)	1.37 (1.20)	0.47	-0.72
Item38	0.61 (1.00)	0.68 (1.05)	0.65 (1.03)	1.45	1.07
Social distance					
Item01	1.55 (1.12)	1.48 (0.98)	1.51 (1.03)	0.47	0.03
Item20	2.21 (1.02)	1.93 (1.34)	2.04 (1.10)	0.11	-0.53
Item28	1.30 (1.20)	1.21 (1.19)	1.25 (1.20)	0.69	-0.37
Item33	2.01 (1.14)	1.76 (1.18)	1.86 (1.17)	0.18	-0.75
Item34	1.10 (1.14)	0.95 (1.20)	1.01 (1.18)	1.03	0.18
Item41	0.78 (1.07)	0.58 (1.12)	0.66 (1.10)	1.74	2.21
Anticipated stigma					
Item02	1.93 (1.40)	1.91 (1.34)	1.92 (1.36)	0.05	-1.18
Item11	1.87 (1.41)	1.84 (1.52)	1.85 (1.48)	0.08	-1.39
Item18	2.17 (1.31)	2.47 (1.22)	2.35 (1.26)	-0.47	-0.74
Item29	1.85 (1.41)	1.85 (1.33)	1.85 (1.36)	0.08	-1.15
Item32	1.63 (1.30)	1.49 (1.27)	1.54 (1.28)	0.35	-0.92
Item37	2.19 (1.38)	2.21 (1.33)	2.20 (1.35)	-0.33	-1.05
Self-stigma					
Item09	1.23 (1.25)	1.06 (1.10)	1.12 (1.16)	0.76	-0.37
Item15	2.58 (1.21)	2.63 (1.20)	2.61 (1.21)	-0.56	-0.55
Item17	2.32 (1.19)	2.18 (1.11)	2.23 (1.14)	-0.24	-0.61
Item19	1.70 (1.20)	1.50 (1.22)	1.57 (1.22)	0.27	-0.79
Item22	1.99 (1.23)	1.70 (1.18)	1.81 (1.20)	-0.01	-0.94
Item40	1.23 (1.22)	0.97 (1.05)	1.07 (1.13)	0.77	-0.24
Avoidant coping					
Item06	1.23 (1.37)	0.93 (1.19)	1.04 (1.27)	0.88	-0.49
Item07	1.19 (1.14)	1.03 (1.17)	1.09 (1.16)	0.76	-0.41
Item10	1.17 (1.48)	0.76 (1.34)	0.91 (1.41)	1.27	0.08
Item14	1.70 (1.20)	2.13 (1.24)	1.97 (1.24)	-0.06	-0.96
Item27	0.74 (0.98)	0.69 (1.06)	0.71 (1.03)	1.42	1.33
Item39	1.32 (1.19)	1.23 (1.17)	1.26 (1.18)	0.55	-0.58
Help-seeking behaviours					
Item03	0.95 (1.16)	0.80 (1.08)	0.86 (1.11)	1.20	0.60
Item05	2.34 (1.35)	2.40 (1.20)	2.38 (1.25)	-0.38	-0.82
Item08	1.19 (1.16)	1.14 (1.15)	1.16 (1.15)	0.69	-0.47
Item12	1.77 (1.30)	1.74 (1.29)	1.75 (1.29)	0.18	-1.01
Item24	1.50 (1.20)	1.13 (1.15)	1.28 (1.18)	0.77	-0.21
Item42	0.68 (1.05)	0.70 (1.05)	0.69 (1.05)	1.39	1.05

Note. M = Mean; SD = Standard deviation. For items translation, refer to the supplementary material through this link: https://osf.io/db3fh/overview?view_only=2f5b6bb8740d40e58eb069d7d169f8c5. Original version of the items is published in Docksey et al. (2022).

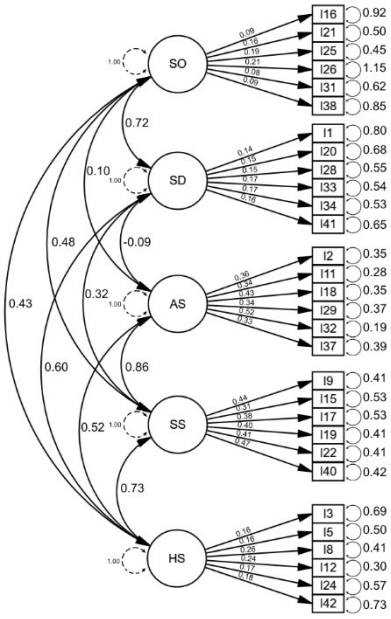
Confirmatory Factor Analysis of SASS

For the confirmatory factor analysis, first, the goodness-of-fit indices for one-factor model were computed, indicating a poor fit (see Table 2). Then, a six-factor model was tested yielding poor goodness-of-fit indices. Most of the items from the AC dimension have lower factor loading regarding the cutoff point, so it was considered a five-factor model without it. This model showed

acceptable goodness-of-fit indices. In this regard, it was decided that the optimum solution would be that of five components. The standardized factor loadings for the total sample and by gender are presented in Table 3.

The confirmatory model is illustrated in Figure 1. The strongest correlations between latent factors were among Anticipated stigma (AS) and Self-stigma (SS) with .86, SS and Help-seeking behaviours (HS) with .73, and Stigma to others (SO) and Social distance (SD) with .72. On the other hand, SO and AS showed low correlations with .10, and SD and AS showed negative low correlation with - .09. All the correlations were significant ($p < .005$).

Figure 1
Confirmatory Factor Analysis Model



Note. Factor loadings are standardized.

Table 3
Standardized Factor Loadings of the Stigma and Self-Stigma Scales for the Total Sample

	One-factor model	Six-factor model	Five-factor model		
Item	Total	Total	Total	Boys	Girls
16	.091	.312	.295	.408	.232
21	.296	.579	.613	.506	.648
25	.341	.705	.699	.745	.657
26	.229	.571	.549	.615	.497
31	.276	.337	.335	.259	.357
38	.137	.337	.318	.574	.213
01	.190	.394	.380	.155	.527
20	.191	.413	.419	.340	.433
28	.168	.463	.467	.299	.538
33	.184	.492	.516	.449	.486
34	.245	.518	.507	.581	.444
41	.206	.461	.458	.355	.464
02	.513	.604	.598	.673	.548
11	.517	.627	.623	.645	.608
18	.508	.660	.663	.734	.634
29	.413	.550	.560	.553	.573
32	.713	.829	.826	.895	.774
37	.405	.537	.542	.582	.519
09	.671	.675	.665	.737	.609
15	.455	.472	.478	.466	.506
17	.535	.557	.564	.600	.537
19	.607	.629	.632	.651	.620
22	.598	.626	.634	.692	.579
40	.681	.690	.680	.700	.654
06	.067	.138			
07	.383	.691			
10	-.032	.048			
14	.298	.375			
27	.326	.579			
39	.071	.144			
03	.325	.414	.395	.494	.299
05	.423	.458	.461	.560	.394
08	.583	.680	.676	.692	.661
12	.589	.681	.712	.748	.701
24	.370	.454	.451	.578	.327
42	.377	.468	.439	.343	.509

Note. All standardized factor loadings estimated were statistically significant ($p < .01$).

Table 2
Goodness-of-fit Indices for the Hypothetical Models Tested and Measurement Invariance of the Stigma and Self-Stigma Scales by Gender

Model	χ^2	*df*	*CFI*	*TLI*	RMSEA (90% CI)	SRMR	Δ_{χ}^2	Δ_{df}	*ΔCFI*
One-factor model	2241.635	594	.768	.754	.086 (.082-.090)	.108			
Six-factor model	1269.727	579	.903	.894	.056 (.052-.060)	.080			
Five-factor model	831.202	395	.929	.922	.054 (.049-.059)	.080			
Gender									
Boys ($n = 145$)	500.091	395	.965	.961	.043 (.030-.054)	.097			
Girls ($n = 233$)	594.892	395	.938	.931	.047 (.039-.054)	.086			
Configural invariance	1094.982	790	.951	.946	.045 (.039-.052)	.091			
Metric invariance	1176.903	813	.941	.937	.049 (.043-.055)	.093	81.921**	23	.01
Scalar invariance	1251.929	840	.933	.931	.051 (.045-.057)	.093	75.026**	23	< .01

Note. χ^2 = Chi square; *df* = degrees of freedom; CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; RMSEA = Root Mean Square Error of Approximation; CI = Confidence Interval; SRMR = Standardized Root Mean Square Residual; $\Delta\chi^2$ = change in χ^2; **$p < .001$, indicates significant $\Delta\chi^2$; ΔCFI = Change in Comparative Fix Index. * ΔCFI ≤ .01 indicates measurement invariance across gender.

Reliability Estimation of SASS Scores

The SASS subscales showed good reliability. The Cronbach's α were .62 (SD), .64 (SO), .71 (HS), .78 (SS), and .80 (AS), and the McDonald's ω were .60 (SO), .61 (SD), .69 (HS), .77 (SS), and .79 (AS). All item discrimination indices surpassed .30.

Measurement Invariance of SASS Scores Across Gender and Latent Means Comparisons

Given that the five-factor model showed a good fit, the invariance measurement was assessed as a function of gender. There was one additional parameter in the case of the metric invariance, a residual covariance between items 16 and 38. The goodness-of-fit indices for boys and girls were adequate (Table 2). The configural, metric, and scalar measurement invariance models showed an adequate fit to the data. Although the Δ_{χ}^{2} between the constrained and unconstrained models was significant, the ΔCFI was equal or below .01. It was concluded that measurement invariance across gender and the five-factor model was defended, grounded on the ΔCFI.

Latent mean differences across gender groups were estimated from the scalar invariance model. Boys scored higher in almost all dimensions, the exception being AS. These differences were statistically significant only for SO ($d = .553$, $p < .001$), SD ($d = .394$, $p < .001$), and SS ($d = .226$, $p < .001$).

Discussion

This study aimed to expand the understanding of the psychometric properties of the Stigma and Self-Stigma scales, using data from a representative sample of students from the University of La Rioja. The findings provided evidence of validity based on the internal structure of the scale, as well as reliability of the test scores and measurement invariance across gender groups. Structurally, the results supported the original five-factor model, consistent with the findings of the original authors (Docksey et al., 2022).

In this way, the present study provides a reliable detection of the stigma regarding MH problems and help-seeking behaviours toward them as one of the main procedure for its prevention and intervention. Thus, considering the prevalence of MH problems (Leow et al., 2024) and stigma towards it in university students' life, a reliable and valid instrument is needed to comprehensively assess this construct, encompassing stigma related to MH problems, people with them, and help-seeking behaviours.

The findings validated the five-factor structure of the scale within the sample with satisfactory goodness-of-fit indices, providing support to the hypothesis that the assessed construct exhibits a multidimensional nature (Docksey et al., 2022). However, some inconsistencies were found. The Avoidant coping dimension had unacceptable level of internal consistency as in the original version (Docksey et al., 2022), factors with lowest loadings being the ones related to drugs and alcohol use, which could be a cultural factor, this is why this dimension was not introduced in the five-factor model analysis. Regarding the item factor loadings, item 16 fell below the threshold of .30. This could be due to the similarity in redaction with item 38, which could lead to problems in the factorial analysis due to its redundance (Ferrando & Anguiano-Carrasco, 2010), and exhibit correlated residuals (Bandalos, 2021). This is why those two redundant items were set as free parameters in the invariance measurement (Husain & Aziz, 2022).

Further evidence of the validity of the measure was provided by the correlations obtained between the five latent dimensions scores of the SASS. Almost all dimensions displayed significantly positive correlations between them. Anticipated stigma and Self-stigma showed the strongest correlation, probably due to the convergence of both of them in the development of the personal stigma construct and how self-stigma influences the anticipated stigma (Fox et al., 2018; Gray et al., 2023; Quinn et al., 2015). As expected, there was a high correlation between Stigma to others and Social distance, as both dimensions constitute a part of public stigma (Corrigan et al., 2014; Lauber et al., 2004). (Lack of) Help-seeking behaviours exhibited significant strong correlations with both Social distance and Self-stigma. Similar patterns have been shown in prior studies, reinforcing the current results regarding Self-stigma and (lack of) Help-seeking behaviours (Evans-Lacko et al., 2012; Shah et al., 2020; Topkaya, 2021). However, there is a scarcity of studies regarding the correlation between (lack of) Help-seeking behaviours and Social distance, as is stated by Yap et al. (2011) and Jorm and Oh (2009). Instead, this phenomenon appears to be more closely related to labelling people with MH problems as a consequence of social distancing (Kosyluk et al., 2020). As a result, individuals may avoid seeking professional help or adhering to treatment in order to prevent social rejection (Hughes et al., 2020; Kosyluk et al., 2020; Sirey et al., 2001), as in the case of social distance. Consequently, the literature usually includes studies using instruments that assess social distance toward people with MH problems and their help-seeking attitudes (Schomerus et al., 2009), a concept also referred to as perceived dependency (Angermeyer et al., 2003). In this regard, this study aims to introduce an instrument designed to analyse these correlations directly and comprehensively. Also, there was a moderate correlation between (lack of) Help-seeking behaviours and Anticipated stigma (Roškar et al., 2022), due to the reluctance for help-seeking in order to avoid identification with the group of people with MH problems (Doll et al., 2021; Pattyn et al., 2014), and with Stigma to others (Özdemir et al., 2023), other studies analysing it in regard with social distance (Colman et al., 2020). Concerning Self-stigma, it had moderate correlations with Stigma to others and Social distance, which was stated also by Shi et al. (2024), due to the relevance of public stigma in the formation of self-stigma, as Stigma to others and Social distance are part of the public stigma dimensionality. Finally, low correlations were found between Anticipated stigma and both Stigma to others and Social distance, the last one with a negative low correlation. Even though Anticipated stigma is part of the self-stigma dimensionality, there is a scarcity of studies which exhibit the relation between Anticipated stigma and public stigma dimensionality. Most of these studies focus on these dimensions regarding help-seeking attitudes (Pattyn et al., 2014; Roškar et al., 2022), and the relation of anticipated stigma to avoid public labelling (Corrigan & Rao, 2012) and discrimination (Masuch et al., 2019). These findings support the first hypothesis of this study, reinforcing the importance of public and personal stigma, and help-seeking behaviours as dimensions for analysing MH stigma.

On this matter, the factors showed satisfactory psychometric properties within the sample. There was satisfactory internal consistency for the SASS factors, as in the original English version (Docksey et al., 2022). The factors proposed coincided with those of the authors and showed acceptable to good reliability and adequate

construct validity, as shown by the correlations observed among the five dimensions, which supported the last hypothesis.

To our knowledge, few studies assessed gender differences and none after performing gender invariance, showing the necessity of this study. In this case, the factorial structure remained invariant across gender groups, suggesting that the latent variables were measured equivalently across all groups, supporting the third hypothesis of this study. So far, only a few studies have examined gender measurement invariance regarding MH stigma dimensions and showed these differences as well, most of them evaluating invariance regarding help-seeking attitudes (Cheng et al., 2024; Goodfellow et al., 2022) or a combination of some of the dimensions analysed in this article (Wu et al., 2015). Also, it is important to state the reduced number of studies that have examined measurement invariance regarding gender in this topic, almost none of them considering the same dimensions as in the SASS that could influence MH stigma. In light of the scarcity of research examining this type of invariance in this instrument, the present study underscores the necessity and significance of addressing this literature gap.

Concerning the differences observed among the latent mean analysis carried out, boys had higher and significant mean scores for Stigma to others, Social distance, and Self-stigma. These results are congruent with those obtained in prior research for the public stigma related to Stigma to others and Social distance (Al Omari et al., 2021; Saavedra & Murvartian, 2021; Sandhu et al., 2019), but there were no studies found regarding Self-stigma. Other studies indicated that public stigma leads to the development of self-stigma related to MH (Vogel et al., 2013). Few studies have examined gender differences across each dimension, as the focus has predominantly been on their association with help-seeking behaviours. Therefore, the present study aims to be a pioneering effort in highlighting these gender-based differences across stigma dimensions.

These findings contributed to a deeper understanding of the dimensions of MH stigma. They may have important implications for the conceptualization, assessment, and development of tailored interventions aimed to reduce MH stigma within educational settings. The distinctive characteristics and perspectives of university students regarding MH make them valuable for investigation in this subject (Koutra et al., 2024). Stigma is an important concept to prevent delay in accessing MH care (Nguyen et al., 2023). In this regard, assessing MH stigma can serve as an initial step toward understanding the nature of the dimensions of stigma and evaluating the stigma perception among university students. This, in turn, enables universities to identify key areas in the students' MH for implementing preventive strategies aimed at promoting MH, following thereby its role (Ley Orgánica 2/2023).

This study's main limitation was the use of only one self-reported questionnaire. Also, the sample belonged to a specific Spanish autonomous community, which may difficult the generalization of the results. Also, the magnitude of some correlations suggests that a more parsimonious model (e.g., a model that comprises three factors) could be plausible. Future research should examine this possibility in larger and more diverse samples to determine whether the multidimensional structure observed here remains stable or if a hierarchical structure provides a better representation of the data. Finally, the gender imbalance represented a constraint, due to boys' prevalence to higher levels of stigma (Dagani et al., 2023; Sum et al., 2024).

The SASS seems to be a brief tool with adequate psychometric properties to assess MH stigma above dimensions that imply public, personal, and help-seeking intentions in university students. In this context, following the approach proposed by Docksey et al. (2022), future studies could analyse stigma among larger groups of university students, doing a comparison among other education levels, and adding qualitative analysis to interpret the bias. The protection and support of young people's MH involves the assessment of MH stigma, to create adaptative programs to promote MH literacy and prevent MH problems.

Author Contributions

Beatrice-Alice Ciulin: Conceptualization, Methodology, Formal analysis, Writing – Original draft. **Alicia Pérez-Albéniz**: Conceptualization, Methodology, Supervision, Writing – Review & editing. **Adriana Díez-Gómez**: Conceptualization, Methodology, Writing – Review & editing. **Beatriz Lucas-Molina**: Formal analysis, Writing – Review & editing. **Rubén Fernández-Alonso**: Formal analysis, Writing – Review & editing.

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Declaration of Interest

The authors declare that there is no conflict of interest.

Data Availability Statement

Research data associated with the article are not available.

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Article

The Influence of Gender on Measuring Mental Health Stigma. A Cross-Sectional Vignette Study With the Attribution Questionnaire 9

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ABSTRACT

Background: The assessment of mental health problems has traditionally been done with male or gender-neutral questionnaires. This study analyzes the effects of the gender of the AQ-9 questionnaire, as well as of the respondent, on stigma towards mental health problems. **Method:** A sample of 2,746 adults from the general Spanish population stratified by gender responded to three different versions of the AQ-9 questionnaire: vignette formulated in the female, male and neutral gender. Analyses of invariance and of differences of means for independent samples (ANOVAS) were carried out for both respondent gender and vignette gender. **Results:** The results show that women tend to be more compassionate and perceive more danger or fear, while men fulfil traditional gender roles by feeling more anger or guilt. Depending on the gender of the vignette, there was a tendency to feel more pity and help towards women, as well as fear, danger, avoidance and coercion towards men. The neutral vignette generated more segregation attributions. **Conclusions:** This study underlines the need to take gender into account when designing assessment instruments. Implications and recommendations from an intersectional perspective are discussed.

La Influencia del Género en la Evaluación del Estigma en Salud Mental. Uso de Viñetas Con el Cuestionario de Atribución 9

Palabras clave:
Estigma
Atribuciones estigmatizantes
Salud mental
Evaluación
Género

RESUMEN

Antecedentes: Tradicionalmente la evaluación de los problemas de salud mental se ha realizado con cuestionarios formulados en masculino o en género neutro. En este estudio se analizan los efectos sobre el estigma hacia los problemas de salud mental tanto del género del cuestionario AQ-9 como del género del encuestado. **Método:** Una muestra de 2.746 adultos de la población general española estratificada por género respondió a tres versiones diferentes del cuestionario AQ-9: viñeta formulada en femenino, en masculino y en neutro. Se realizaron análisis de invarianza y de diferencia de medias para muestras independientes (ANOVAS) tanto para el género del encuestado como para el género de la viñeta. **Resultados:** Las mujeres tienden a mostrar más compasión y percibir más peligro o miedo, mientras que los hombres cumplen los roles tradicionales de género al sentir más ira o culpa. En función del género de la viñeta, hay una tendencia a sentir más compasión y ayuda hacia las mujeres, y más miedo, peligrosidad, evitación y coacción hacia los hombres. La viñeta neutra generó más atribuciones de segregación. **Conclusiones:** Se subraya la necesidad de considerar el género en el diseño de instrumentos de evaluación. Se discuten las implicaciones y recomendaciones desde una perspectiva interseccional.

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Stigma related to mental health problems (MHP) is a dynamic social process that encompasses negative thoughts, feelings, and behaviors directed at individuals with a diagnosis (Ottati et al., 2005), and operates at various levels (structural, personal and social), each interacting with the others (Corrigan & Watson, 2004). From this social perspective, stigma does not occur in isolation from other social phenomena, as the presence of sexism, and it is possible to speak about intersectional stigma.

Intersectionality, a term originating from feminist and anti-racist movement called Combahee River Collective (Nardi & Schneider, 1979), refers to the interaction between factors such as gender and discrimination (Crenshaw, 1989). It involves the overlap or intersection of identities, which amplifies the reasons for discrimination or experiencing stigma depending on the individual's identity. This means that the stigmatization process is complex and multifaceted, with different dimensions of identity intersecting to create unique experiences of marginalization and discrimination for each person.

The study of gender and stigma from an intersectional perspective and considering the effect of gender and MHP is scarce, with mixed results. Zamorano et al. (2023), in their review on social stigma in Spain, point out that the relationship between social stigma and gender presents contradictory results (social stigma sometimes it is higher in men and sometimes in women), finding these mixed results also in international systematic reviews on internalized stigma (Del Rosal et al., 2021; Livingston & Boyd, 2010). A specific systematic review on the effect of gender differences in mental health beliefs, found that in overall, women had less social stigma, and were more willing than men to recommend professional help and evaluate treatment more favorably, as well appear to be less dismissive than male persons with MHP (Holzinger et al., 2012). In the same line, a systematic review on MHP stigma in men, confirms the links between gender, masculinity, and stigma, arguing that hegemonic masculinities that idealize men as strong, self-sufficient, and healthy also subordinate men with mental illness, viewing them as weak, inadequate, and unmanly (McKenzie et al., 2022), according to Vogel et al. (2011) model, which shows the role of conformity to dominant U.S. masculine norms and their interference with professional help-seeking in men. However, other studies have pointed out the presence of a greater stigma towards women who must face a sexist society in which they are more discriminated against (Fredman, 2016; McCall, 2005), which sometimes fails to recognize "typical male" symptomatology in women (for example, psychotic symptomatology) (Roberts & Parry, 2023), and which overlooks aspects of mental health unique to women, such as the stigma surrounding postnatal MHP (McLoughlin, 2013; Roberts & Parry, 2023) or during pregnancy (Thi et al., 2024).

From another approach, Boysen et al. (2014) proposed that mental disorders seem to be linked to specific genders, suggesting that people tend to associate some MHP with male (addictions, paraphilias...) or female (eating disorders, body dysmorphia...) stereotypes, with male disorders being more rejected. Gender differences in mental disorders are often attributed to the varying tendencies of men and women to exhibit externalizing and internalizing symptoms. In general terms, externalizing symptoms involve disturbance in conduct, while internalizing symptoms involves disturbances in feelings. This author defends that externalizing symptoms cause greater stigma than internalizing ones, and the keys to the generation of stigma are warmth and internalizing or externalizing symptomatic behavior, but not the male or female gender (Boysen, 2017). Furthermore, highly stigmatized disorders are more common among men, and less-stigmatized disorders are more common among women. In the same line, Wirth & Bodenhausen (2009) found that when presented with gender-typical MHP cases (substance abuse in men, and depression in women), respondents felt more negative affect, less sympathy, and less inclination to help compared to cases where gender was not typical in the disorder, arguing that these atypical cases were not seen as true MHP.

The existence of an interaction between stigma and gender seems clear, although the effects of this connection show mixed results. This may be due to the fact that traditional measures of stigma assessment are scales or questionnaires with items that inquire about general attitudes towards mental health, for example the Community Attitudes to Mental Illness (CAMI) (Taylor & Dear, 1981) with no-gender items, or instruments that include a vignette with a hypothetical case of a person diagnosed with a MHP, such as the Attribution Questionnaire (Corrigan et al., 2002) or the Social Distance Scale (Link et al., 1987). These vignettes typically feature a male character, overlooking the potential interaction between MHP and gender, and falling to account for the intersectional aspects of stigma, such as how gender may shape the experience of MHP. Moreover, traditionally, gender analyses of questionnaires tend to focus on exploring their factorial structure and variation according to the respondents' gender (Lucas-Molina et al., 2017; Marrero et al., 2020), rather than on modifying the gender of the questionnaire itself and analyzing the effects on the responses.

However, some studies have focused on examining the differences between vignettes starring male and female characters, finding interesting differences. Eiroa-Orosa & Sanchez-Moscona (2025), in a study conducted with vignettes in which gender was manipulated, it was found that verbal aggressiveness was related to gender and affected clinical judgment. In Uganda, Lee et al. (2024), found greater acceptance of women with depression compared to men. As did Kasahara-Kiritani et al. (2018), in Japan, where men with depression were more stigmatized than women. Anderson et al. (2015), who found that the vignette of a man who was not under treatment was associated with a greater desire for social distance than the vignette of a woman. In the same vein, Sowislo et al. (2017) in Switzerland, found greater perceived dangerousness in the vignette of a male with schizophrenia versus a female-gendered vignette. And Barthels, Hanewinkel & Morgenstern (2025), found that stigmatization of gambling disorder were higher in men vignettes compared to female. On the contrary, Gearing et al. (2015), found in Jordan, that adolescent boys were more accepted versus girls, as well as in a vignette with adults the male was more accepted as a future employee, although boys were more likely to be stigmatized if they treated their disorder. And Digwamaje & Tadi (2024), in South Africa found that when a man is diagnosed with schizophrenia the cause is spiritual, while in women it is a medical reason. And on the other hand, other studies where the gender of the vignettes was manipulated, found no significant differences depending on the gender of the character (Ahmad et al., 2022; Krzemieniecki & Gabriel, 2021).

Therefore, the aim of this study was to explore the differences in stigma towards MHP according to the gender of the respondent and the gender of the questionnaire in a sample of the Spanish population. Our research questions were: Do women or men have

higher or lower stigma towards MHP? Will they respond with more stigma if the person with a MHP is a man than if it is a woman or the gender is not specified? To answer these questions, a cross-sectional quantitative study was conducted to assess stigma towards MHP using the Attributional Questionnaire 9, which assessed stigmatizing attributions in three types of vignettes: one male, one female and one neutral. We then conducted analyses of invariance and mean difference as a function of respondent gender and questionnaire gender.

Method

Participants

The sample consisted of $N = 2{,}746$ individuals from the general population aged 18 and older. The sample was stratified by sex, age, and territory, incorporating quotas for both sex and age groups, as well as data from each of the 17 Spanish Autonomous Communities (AC), using simple allocation to ensure a minimum of 100 surveys per AC. Sampling conditions ensure a confidence level of 95.5% with $p = q = 50\%$. The error margin is ± 1.88% for the total sample, ± 10% for communities with 100 cases, ± 8.16% for 150 cases, and ± 5.76% for 300 cases.

The inclusion criteria for participating in the study were residency in Spain, being over 18 years of age, and having internet access to complete the evaluation. Exclusion criteria included minors and individuals without internet access.

Instruments

Ad hoc items on socio-demographic data were collected, including age, gender of participant, education level, marital status, place of residence size, parenthood status.

Three ad hoc questions assessing the level of contact with MHP: *Have you ever consulted a specialist for mental health problems? Do you currently live with, or have you ever lived with a person with a mental disorder? Do you currently know, or have you ever known a person (friend, neighbour, partner, etc.) with a mental health problem?*

Stigmatizing attributions related to MHP were assessed using the Attribution Questionnaire-9 (AQ-9) (Corrigan et al., 2014), a shortened 9-item version of the Attribution Questionnaire-27 (AQ-27) (Corrigan et al., 2003). This questionnaire was chosen to assess stigma because of its vignette format, which allows each case to be adapted according to the researcher's interests. Additionally, the AQ-27 has a Spanish version (Muñoz et al., 2015), and its shortened form has been utilised in multiple studies (González-Domínguez et al., 2019; González-Sanguino et al., 2022; González-Sanguino et al., 2019). Participants are introduced to a fictional character through a vignette, with three different versions in this study:

Male vignette: *"John is a 30-year-old single man with schizophrenia. He sometimes hears voices and gets upset. He lives alone in an apartment and works as a clerk in a large law firm. He has been hospitalised six times because of his illness".*

Female vignette: *"Marta is a 30-year-old single woman with schizophrenia. She sometimes hears voices and gets upset. She lives alone in an apartment and works as a clerk in a large law firm. She has been hospitalised six times because of her illness".*

Neutral vignette: *"Garcia is a 30-year-old single person with schizophrenia. He/She sometimes hears voices and gets upset. He/She lives alone in a flat and works as a clerk in a large law firm. He/She has been hospitalised six times because of his/her illness".*

After reading the vignette they rate nine stigma-related attributions toward individuals with MHP using Likert-type items (1–9). Another reason for choosing this questionnaire is that in addition to its total scores showing higher or lower stigma, each item represents a stigmatizing attribution that can be assessed separately. These attributions include Pity, Dangerousness, Fear, Blame, Segregation, Anger, Help, Avoidance and Coercion. Each dimension is scored from 1 to 9 (total score range 9-81). Higher scores indicate greater levels of stigma. For this sample, Cronbach's alpha was .733.

Procedure

This research is part of a study on stigma related to MHP, intellectual disability and homelessness conducted by the Chair Against Stigma Grupo5-UCM (Zamorano et al., 2022). In this research only instruments and results regarding MHP were used.

The fieldwork was conducted by the company "Grupo análisis e investigación" (Analysis and Research Group) through Computer-Assisted Web Interviews (CAWI), in a panel sample of the Spanish population, randomly selected. Data collection took place between January 19 and February 8, 2022. The CAWI process involved participants answering a series of self-administered questions within an established protocol. Participants were informed about the study beforehand and consented to participate anonymously. The average completion time for the survey was approximately 20 minutes.

To assess gender and its interaction with stigma, three versions of the survey (female, male and neutral gender) were designed and applied randomly to the sample. Gender implied the writing of all the items in these conditions, as well as the design of vignettes where a female case (identifying the person with a female name), a male case (identifying the person with a male name), and a neutral case (identifying the person with a surname) were included.

The study "Stigma in the spanish population. A look at people with mental health problems, homelessness or intellectual disabilities" received approval from the Deontological Commission of the Faculty of Psychology at Complutense University of Madrid (Ref. 2020/21-026) and was registered with Clinical Trials (NCT05174962). All results were processed following the guidelines outlined in Regulation (EU) 2016/679 of the European Parliament and the Council of April 27, 2016, regarding the protection of personal data.

Data Analysis

First, descriptive analyses were carried out for both the sample and the dependent variable scores for the respondent's gender and for the different versions of the questionnaire (female, male, neutral).

When designing, constructing or adapting a new questionnaire, it is important to consider how secure comparisons are to be made between scores obtained from different groups or populations. To ensure that the instrument measures the same results in an equivalent way across different groups or conditions, a factorial invariance analysis was carried out. Without this assessment, comparisons between groups could be invalid, as observed differences in scores could be due to biases in the questionnaire and not to actual differences in the constructs measured. Testing the independence structure between questionnaire items was carried out with a Confirmatory

Factor Analysis (CFA) using the lavaan package (Rosseel, 2012). In the model, as many factors as items are established (factor variances are set to zero) and independence is established between them (covariances equal to zero). As the data are reasonably continuous and normal, the model is estimated by Maximum Likelihood (ML). The usual fit indices root-mean-square error of approximation (RMSEA), comparative fit index (CFI) and Tucker–Lewis index (TLI) are reported. The investigation of possible non-independent item structure is carried out with Exploratory Factor Analysis and the factor recommendation algorithms MAP (Velicer's Minimum Average Partial) and parallel, implemented in the psych package (Revelle, 2025). Finally, the validation of the final factor model and the invariance check for the groups formed by respondent gender and questionnaire type was carried out through CFA with the lavaan package. Results are provided for configural invariance (similar factor structure between groups), metric invariance (similar factor loadings between groups) and scalar invariance (similar intercepts between groups). For each level of invariance, the usual fit indicators and the contrast between models are provided. The estimation method was also ML and invariance was studied for both respondent gender and questionnaire version.

The effect of respondent gender and questionnaire version (female, male, neutral) on AQ-9 measures was tested with an analysis of variance for independent samples (ANOVA). The Tuckey test was used to analyse pairwise differences between the means of the factor levels. Due to the low proportion of people with a gender other than male/female in the sample (only eight subjects) in the respondent's gender, only analyses with the male/female category were carried out and the non-binary people were eliminated from the sample.

Data were analyzed using R, version 4.0.0 (R Core Team, 2020).

Results

Sample

The sample consisted of 2,746 people (54.3% women) aged 18 to 89 (M = 46, SD = 15.7), with a majority of individuals with a university education (47.4%), progressive political views (47.2%), being married or living with a partner (64%), and residing in large cities with more than 100,000 inhabitants (48.9%). Additionally, a large majority (63.9%) knew someone with MHP, and 21% of the sample had personally experienced them. Regarding the surveys conducted, 44.17% of responses were for the female questionnaire, 45.63% for the male questionnaire, and 10.2% for the gender-neutral questionnaire. The sociodemographic characteristics of the sample can be found in Table 1.

Table 1
Socio-demographic Characteristics of the Sample (N = 2746)

Variable	*N*	%
Age		
18 to 24 years old	257	9.4
25 to 44 years old	1052	38.3
45 to 64 years old	1027	37.4
65 and over	410	14.9
Gender of respondent		
Male	1256	45.7
Female	1490	54.3
Questionnaire version		
Male	1253	45.63
Female	1213	44.17
Neutral	280	10.2
Marital status		
Single	736	26.8
Married or living with partner	1758	64
Divorced or separated	195	7.1
Widowed	57	2.1
Children		
No	1223	44.5
Yes	1523	55.5
Level of education		
No education	20	0.7
Elementary / Primary /EGB	161	5.9
Secondary / High School /	1264	46
University	1301	47.4
Residence		
City with more than 500.000 inhabitants	510	18.6
City between 100,000 and 500,000 inhabitants	833	30.3
City with between 20,000 and 100,000 inhabitants	754	27.5
Town with less than 20,000 inhabitants	649	23.6
Contact with mental health problems		
Have consulted with a mental health specialist (Yes)	2170	21
Know or have known a person with a mental disorder (Yes)	1756	63.9
Living with or have lived with a person with a mental disorder (Yes)	597	21.7

Invariance

First, the hypotheses of independence (there are as many independent factors as items) and of a single-factor model (all items have loadings on a single common factor) were tested and both were rejected.

The inspection with the MAP and parallel algorithms, together with the exploratory factor analyses led to the proposal of a structure composed of four factors, the first with loadings on items 2, 3, 5 and 8; the second with loadings on items 4, 6, 5 and 8 and a third and fourth factor that collect the variance of items 1 and 9 respectively. When the exploratory and confirmatory factor analyses were carried out, it was found that item 7 behaved erratically with respect to the other items, making the matrices undefined, so it was eliminated from the invariance analyses.

The fit indices indicate that the models are well fitted to the empirical data, with all RMSA values being less than .05, standardized root-mean-square residual (SRMR) values less than .02 and CFI and TLI values greater than .98. Using these models, factorial invariance was tested. Overall, the data supports a level of configurational invariance for all measures, which can be interpreted as the same factor structure (scores on items of the same factors). A level of metric invariance was found for both respondent gender and the version of the questionnaire presented. No other level of invariance can be clearly established.

Differences Between the Variables Studied

Table 2 presents the results of the analysis of plannified differences between the variables studied. These results are presented in detail below.

Table 2
Differences in the Variables Studied According to the Gender of the Respondent and the Gender Version of the Questionnaire

		Sum of Squares	*Df*	Mean Square	*F*	*p*
Item 1. Pity	Gender	25	1	25.16	5.623	.018
	Version	34	2	17.02	3.804	.022
	Interaction	1	2	0.68	0.152	.859
Item 2. Dangerousness	Gender	87	1	87.42	24.456	< .001
	Version	62	2	31.25	8.741	< .001
	Interaction	6	2	3.05	0.854	.426
Item 3. Fear	Gender	175	1	174.98	42.372	< .001
	Version	84	2	42.06	10.184	< .001
	Interaction	3	2	1.75	0.423	.655
Item 4. Blame	Gender	21	1	21.48	6.828	.009
	Version	17	2	8.27	2.628	.072
	Interaction	3	2	1.28	0.406	.666
Item 5. Segregation	Gender	6	1	6.28	1.372	.242
	Version	70	2	35.04	7.654	< .001
	Interaction	14	2	6.97	1.523	.218
Item 6. Anger	Gender	16	1	16.43	4.617	.032
	Version	13	2	6.37	1.791	.167
	Interaction	7	2	3.55	0.998	.369
Item 7. Help	Gender	12	1	12.06	4.075	.044
	Version	38	2	19.24	6.502	< .001
	Interaction	7	2	3.30	1.114	.328
Item 8. Avoidance	Gender	2	1	1.66	0.385	.535
	Version	74	2	36.90	8.564	< .001
	Interaction	3	2	1.42	0.331	.719
Item 9. Coercion	Gender	21	1	21.16	4.557	.033
	Version	45	2	22.55	4.857	.008
	Interaction	1	2	0.63	0.136	0.873
Total	Gender	664	1	663.60	6.529	.010
	Version	1216	2	608.10	5.983	.003
	Interaction	98	2	49.20	0.484	.616

Differences by Respondent Gender

Regarding the differences by gender of the respondent, we found significant differences both in the total score and in most of the items except for items 5 (Segregation) and 8 (Avoidance). Table 3 shows all scores in detail.

Table 3
Stigmatizing Attributions Towards Mental Health Problems by Gender of the Respondent

AQ-9	Women *M (SD)*	Men *M (SD)*
	***N* = 1490**	***N* = 1256**
Item 1. Pity	5.96 (2.05)	5.77 (2.19)
Item 2. Dangerousness	4.66 (1.87)	4.3 (1.93)
Item 3. Fear	4.62 (2.03)	4.12 (2.05)
Item 4. Blame	2.19 (1.7)	2.37 (1.86)
Item 5. Segregation	3.38 (2.14)	3.47 (2.16)
Item 6. Anger	2.68 (1.88)	2.83 (1.9)
Item 7. Help	6.5 (1.68)	6.37 (1.77)
Item 8. Avoidance	3.95 (2.06)	3.9 (2.11)
Item 9. Coercion	6.53 (2.15)	6.36 (2.17)
Total	40.48 (9.89)	39.49 (10.34)

As can be seen in tables 2 and 3, in general, females have significantly higher scores than males on items 1 (Pity, $F = 5.623$, $p = .018$), 2 (Dangerousness, $F = 24.456$, $p < .001$), 3 (Fear, $F = 42.372$, $p < .001$), 7 (Help, $F = 4.075$, $p = .044$) and 9 (Coercion, $F = 4.557$, $p = .033$). In addition, they also have higher scores compared to men on the total score ($F = 6.529$, $p = .010$). On the other hand, males have higher scores on items 4 (Blame, $F = 6.828$, $p = .009$) and 6 (Anger, $F = 4.617$, $p = .032$).

Differences by Questionnaire Version (Female, Male, Neutral)

Regarding the version of the questionnaire, we found significant differences both in the total score and in most of the items, except for items 4 (Blame) and 6 (Anger). The Tuckey test is used to establish between which pairs of values of the variables studied there are significant differences. All scores can be found in Table 4.

Table 4
Stigmatizing Attributions Towards Mental Health Problems by Version of the Questionnaire

AQ-9	Female version *M (SD)*	Male version *M (SD)*	Neutral version *M (SD)*
	***N* = 1213**	***N* = 1253**	***N* = 280**
Item 1. Pity	5.93 (2.15)	5.9 (2.08)	5.55 (2.15)
Item 2. Dangerousness	4.36 (1.9)	4.66 (1.92)	4.41 (1.83)
Item 3. Fear	4.23 (2.06)	4.57 (2.05)	4.25 (2)
Item 4. Blame	2.18 (1.72)	2.33 (1.81)	2.37 (1.85)
Item 5. Segregation	3.3 (2.1)	3.44 (2.16)	3.86 (2.22)
Item 6. Anger	2.67 (1.89)	2.81 (1.88)	2.82 (1.91)
Item 7. Help	6.57 (1.7)	6.32 (1.76)	6.42 (1.65)
Item 8. Avoidance	3 .77 (2.06)	4.11 (2.08)	3.86 (2.1)
Item 9. Coercion	6.35 (2.19)	6.59 (2.13)	6.28 (2.15)
Total	39.36 (10.03)	40.72 (10.13)	39.81 (10.19)

As can be seen in tables 2 and 4, the female-formulated questionnaire has higher scores compared to the male on item 7 (Help, $F = 6.502$, $p < .001$, p adj Tuckey < .001), and higher scores compared to the neutral on item 1 (Pity, $F = 3.804$, $p = .022$, p adj Tuckey = .019).

The questionnaire formulated in masculine presents higher scores compared to feminine in items 2 (Dangerousness, $F = 8.741$, $p < .001$, p adj Tuckey < .001), 3 (Fear, $F = 10.184$, $p < .001$, p adj Tuckey < .001), 8 (Avoidance, $F = 8.564$, $p < .001$, p adj Tuckey < .001), 9 (Coercion, $F = 4.857$, $p = .008$, p adj Tuckey = .016) and on the AQ-9 total score ($F = 5.983$, $p = .003$, p adj Tuckey = .002). On the other hand, compared to the neutral version, the male questionnaire shows higher scores on items 1 (Pity, $F = 3.804$, $p = .022$, p adj Tuckey = .030) and 3 (Fear, $F = 10.184$, $p < .001$, p adj Tuckey = .042).

As for the questionnaire formulated in neutral, it presents higher scores than the male and female versions in item 5 (Segregation, $F = 7.654$, $p < .001$, p adj Tuckey neutral-male = .009, p adj Tuckey neutral-female < .001).

Differences for the Interaction Between Respondent Gender and Questionnaire Version

No significant differences were found for the interaction in any of the questionnaire items, nor for the total score.

Discussion

This cross-sectional study shows that both vignette and respondent gender significantly shape stigma assessment results, underscoring the need to integrate gender considerations into instrument design. Regarding the gender of respondents, significant differences are found in the total score and in most of the items except *Segregation* and *Avoidance*. Women score significantly higher on the total score and on the perceptions of *Pity, Dangerousness, Fear, Help* and *Coercion*, while men score higher on *Blame* and *Anger*. This seems to reveal cultural differences typical of traditional masculinity and femininity constructs, where women are established as nurturing and more empathetic and fearful, thus responding to the AQ-9 questions, whereas the traditional masculinity construct implies more strength and respect, corresponding to higher attributions of anger and guilt in male respondents.

These results are consistent with some studies that underline the same ideas around male hegemonies in social stigma (McKenzie et al., 2022; Voguel et al., 2011) and with the results of the systematic review by Holzinger et al. (2012) who note that women appear to be more willing to volunteer and become involved in the care of people with MHP. They are also in line with those of Bradbury (2020), who finds that the gender of respondents to an attitude questionnaire influences attitudes towards people with schizophrenia, with women's attitudes being more positive than those of men. However, the systematic review by Holzinger et al. (2012) indicates that, in most of the studies reviewed, the stereotypical dangerousness perceptions of MHP was equally prevalent among male and female respondents. In contrast, women perceive people with MHP as responsible for their illness to a lesser extent. Continuing the results of the review by Holzinger et al. (2012), women expressed more positive reactions, less anger and more fear perceptions towards people with MHP, with no gender differences found in terms of desire for social distance and acceptance of coercion in the treatment of people with MHP.

In addition, most of the studies reviewed by Holzinger et al. (2012) found that women were more willing to seek professional help when presenting with a MHP and rated the outcomes of mental health treatments more favourably. These data are consistent with those shown in the recent meta-analysis by Üzümçeker (2025), in which men were less likely than women to seek professional help for their MHP, with the authors noting that traditional masculinity is one of the factors influencing men to seek less psychological help.

Regarding the gender version of the questionnaire, significant differences were found in total score and in most of the items, except in *Blame* and *Anger*. Female vignettes scored higher on Help and although help can be viewed as either stigmatizing (paternalistic) or non-stigmatizing (treating the person equally), the female vignette elicited more helping attributions, portraying women as more helpless and reinforcing traditional gender stereotypes (Fredman, 2016; McCall, 2005). *Pity* is an emotion that tends to be elicited by people perceived as very warm but not very competent (Cuddy et al., 2008), so it is associated with active helping efforts, and could partly explain the significant differences found in the female vignettes on the *Help* item. On the other hand, male vignettes score significantly higher compared to the female on the *Dangerousness, Fear, Avoidance, Coercion* and total score items. These results are consistent with those found by Sowislo et al. (2017) in Switzerland, noting how the case of a man with schizophrenia generated more fear perceptions than a woman. As well as being in line with the findings of Anderson et al. (2015), where in their vignettes men generated more desire for social distance. In addition, it should be noted that the vignette used in the present study includes the diagnosis of schizophrenia, which is more typically male, so perhaps, as other authors have pointed out, recognising this symptomatology in the case of a man is easier than in women and the mental prototype generated may imply more fear or danger perceptions (Roberts & Parry, 2023), since it is easier to find cultural references (in the media, films, or novels) that show stigmatized prototypes of 'scary' men with schizophrenia. Complementarily, in the systematic review by Holzinger et al. (2012) women with a MHP were considered less dangerous and received less rejection than men with MHP.

This could be partly explained by the Stereotype Content Model (SCM), which states that stereotypes about a social group follow two dimensions of social judgement: warmth and competence (Fiske & Durante, 2016). Taking these two dimensions into account, Allstadt Torras et al. (2023) found that people with more externalising disorders such as schizophrenia are perceived as low in warmth and competence within the SCM. Whereas more internalising disorders such as Specific Phobia are perceived more positively on both dimensions. In the same vein, Boysen (2017) finds that low warmth and stereotypically masculine disorders such as schizophrenia consistently elicit negative emotions and behavioural intentions. Furthermore, this author finds evidence, albeit limited, that men with a MHP, compared to women, elicited more fear perceptions and more intention to commit harm, pointing to clear associations between interpersonal warmth, negative emotions and intention to commit behavioural harm.

However, in the neutral questionnaire the scores are higher for *Segregation* compared to the male and female versions, so it seems that gender in this dimension of stigma is not relevant, in line with the findings of other authors (Ahmad et al., 2022; Krzemieniecki & Gabriel, 2021). In addition, the neutral questionnaire shows lower scores compared to the female on *Pity* and compared to the male on *Pity* and *Fear*. In this regard it should be noted that stigma assessment has traditionally been conducted from a male perspective, with questionnaires designed by men and with a focus on assessing the prevailing male stigma. For example, many questionnaires assess dangerousness towards people with MHP, sometimes exclusively, but overlook stigmatizing aspects related to women such as symptom exaggeration, incompetence or the stigma associated with mental health in pregnancy or postpartum (McLoughlin, 2013; Roberts & Parry, 2023; Thi et al., 2024). Finally, no significant differences were found for the interaction between respondent gender and questionnaire version in any of the questionnaire items, nor for the total score.

This study has interesting practical implications, as it may also impact policies related to stigma. It is essential to include gender in the construction of questionnaires, as well as to take the intersectional paradigm into account. Stigma is a construct closely linked to gender, and clinicians and policymakers should be aware that existing traditional instruments have certain limitations that do not capture these implications. Greater investment should be made in the development of questionnaires that address these biases to ensure appropriate assessment, as well as in training professionals

on gender-related issues. Moreover, considering the gender-based differences in attitudes when designing anti-stigma prevention and intervention campaigns would help make them more effective.

This study has several limitations. Although the sample aimed to represent the Spanish population, some groups (e.g., rural residents, youth, and older adults) may be underrepresented. Territorial representativeness was also limited, preventing analysis by Autonomous Communities. Vignettes only differed in relation to the identification of the person (male or female name or surname); without including prototypical gender traits in the description of the case to avoid bias and orient the responses. The 'neutral' case refers to a person with schizophrenia and psychotic symptomatology, modifications in the symptomatology would probably have accentuated the differences found. Generalization is also constrained by cultural context, as results may not apply beyond Spain. Finally, the vignette specified the individual's diagnosis (schizophrenia), so findings may not extend to other diagnoses.

In conclusion, over time, intersectionality in relation to stigma has been studied in connection with various conditions, with some recent tools developed to assess the intersectional discrimination experienced by people with MHP and its interaction with factors like age, gender, or ethnics (Chen et al., 2022; Forbes et al., 2023; Pederson et al., 2022; Taylor & Richards, 2019). However, gender is not usually represented in traditional questionnaires, which are typically designed from a male perspective focused on assessing the prevailing male stigma. The analysis conducted in this study can help in the construction of better questionnaires and its interpretation can establish the certainty of the results obtained in group comparison studies, clarifying the generally mixed or contradictory results that exist around gender and stigma with important practical implications.

Author Contributions

Clara González-Sanguino: Conceptualization, Methodology, Project administration, Supervision, Visualization, Writing - Original draft, Writing - Review and editing. **Miguel Ángel Castellanos:** Conceptualization, Data curation, Formal analysis, Methodology, Visualization, Writing - Original draft, Writing - Review and editing. **Ana Belén Santos-Olmo:** Conceptualization, Data curation, Methodology, Visualization, Writing - Original draft, Writing - Review and editing. **Sara Zamorano:** Conceptualization, Data curation, Investigation, Methodology, Visualization, Writing - Original draft, Writing - Review and editing. **Berta Ausín:** Conceptualization, Methodology, Visualization, Writing - Original draft, Writing- Review and editing. **Manuel Muñoz:** Conceptualization, Funding acquisition, Investigation, Methodology, Project administration, Supervision, Visualization, Writing - Review and editing.

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Declaration of Interest

The authors declare that there is no conflict of interest.

Data Availability Statement

All data and materials used in this analysis are available from the corresponding author upon reasonable request.

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Article

Relationship Between Social Connectedness and Quality of Life in Older Adults: An Examination of Sex Differences

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ABSTRACT

Background. Despite the literature supporting the important role of social connectedness in older people's Quality of Life (QoL), study of this association has been scarce, especially sex-specific social mechanisms. This study aimed to examine how social connectedness related to QoL in community-dwelling older adults, considering sex differences. **Method**. 709 people from Spain, aged 60 and over participated in the study and completed a survey that included sociodemographic characteristics, social connectedness, psychological resources, mental health and QoL. Path analysis was performed to test the hypothesized model. Associations between the assessed variables were tested separately for men and women. **Results**. The relationship between family function and QoL was fully mediated by psychological resources and mental health, but the direct paths used by women were different from men. The relation between loneliness and QoL was partially mediated, with gratitude and resilience playing a more prominent role among women. **Conclusions**: The critical role of social factors is highlighted, as humans are inherently social beings. The study found sex differences in the relationship between social connectedness and QoL, mediated by psychological resources, well-being, and distress. Men and women cope with adversity differently. It is important to consider sex differences when designing interventions for older adults.

Relación Entre la Conexión Social y la Calidad de Vida en Personas Mayores: Un Análisis de las Diferencias por Sexo

Palabras clave:
Soledad
Función familiar
Envejecimiento
Resiliencia
Gratitud

RESUMEN

Antecedentes: A pesar del apoyo de la literatura al importante papel de la conexión social en la Calidad de Vida (CV) de las personas mayores, el estudio de esta asociación es escaso, especialmente en los mecanismos sociales específicos de cada sexo. Este estudio analizó la relación entre conexión social y CV en adultos mayores que vivían en la comunidad, considerando diferencias por sexos. **Método:** Participaron 709 personas de 60 años y más. Se utilizó un modelo de ecuaciones estructurales para probar el modelo hipotetizado. Las asociaciones entre las variables evaluadas se probaron por separado para mujeres y hombres. **Resultados:** La relación entre función familiar y CV fue completamente mediada por recursos psicológicos y salud mental, pero los resultados difirieron en mujeres y hombres. La relación entre soledad y la CV fue mediada parcialmente, siendo la gratitud y la resiliencia más relevantes en mujeres. **Conclusiones:** Se destaca el papel crítico de los factores sociales, ya que los seres humanos somos inherentemente sociales. El estudio encontró diferencias por sexos en la relación entre conexión social y CV, mediada por recursos psicológicos, bienestar y angustia. Hombres y mujeres enfrentan las adversidades de manera diferente. Es importante considerar estas diferencias al diseñar intervenciones.

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Quality of Life (QoL) is an expression of how people perceive their attitude towards life considering their culture, targets, expectations, lifestyles and interests (WHO Quality of Life Assessment Group, 1996). The Social Determinants of Health (SDOH) play a decisive role in older people's QoL (Gu et al., 2019).

The SDOH are grouped into five dimensions: economic stability, social and community context, education access and quality, health care access and quantity and quality, and neighborhood and built environment (U.S. Department of Health and Human Services, Office of Disease Prevention and Health Promotion, 2025). Although all the SDOH dimensions can impact QoL, the interest in social and community context, i.e., social connectedness, has received more attention globally, especially after the COVID-19 pandemic (National Academies of Sciences, Engineering, and Medicine [NASEM], 2020).

Older people consider social connectedness to extend beyond the objective social dimension (quantity). It is a multilevel concept that also encompasses the subjective aspect and the perceived quality of social support (Morgan et al., 2021). This subjective dimension of social connectedness has been considered the opposite of loneliness (Morgan et al., 2021). On the one hand, the literature indicates that the social relationships older adults have in general are essential for QoL. The relationship with their closest relatives is especially important for older adults (Kousha et al., 2022) and family support is the main and primary source of social support for most older people and is related with better QoL (Nakhodaeezadeh et al., 2017).

On the other hand, the physical and psychological short and long-term negative consequences of isolation and loneliness are well documented (NASEM, 2020). Research has also supported the significant relationship between lack of social connections and mortality risk, poor physical and mental health, such as depression and anxiety (Park et al., 2020). As a result, health and well-being could be directly or indirectly explained by social connection from 40% to more than 80% (Hood et al., 2016). Older adults´ social connections are related to better health, successful aging and longevity and decreased rates of depression (NASEM, 2020; World Health Organization, 2015).

The stress and coping model (Lazarus & Folkman, 1984) highlights the importance of the person´s resources and coping strategies buffering the impact of stress on people´s health. Some examples of psychological resources acting as mediators between stress and health indicators have been resilience, acceptance and gratitude (Pérez-Rojo et al., 2021). First, resilience protects older adults from stressful and potentially traumatic events and increases older adults' adaptability, which maintains a better QoL (Ratanasiripong et al., 2022). Second, acceptance is the capacity to actively open oneself to experiencing private events or internal stimuli/world/environment, particularly those perceived as negative due to the suffering they cause, without the intention of escaping from them or changing their form or frequency (Hayes et al., 2011). Older adults with higher levels of acceptance exhibit higher QoL in the domains of health, safety, community participation, and emotional well-being (Butler & Ciarrochi, 2007). Third, gratitude is a feeling of thankfulness and joy in response to the receipt of a gift regardless of whether it is something tangible or not (Emmons, 2004). Gratitude promotes social interactions and satisfaction with them and has shown beneficial effects on emotional well-being. Empirical evidence supports a positive relationship between gratitude and overall QoL (Jans-Beken et al., 2020).

Moreover, sex differences should be considered when analyzing older adults' QoL. Men tend to report higher levels of QoL compared to women (Beridze et al., 2020). A longitudinal study using three waves of the Survey of Health, Ageing and Retirement in Europe also found lower levels of QoL in women across all time points (Torres et al., 2024). Women' life expectancy is higher than that of men, and the risk of facing challenges that may compromise QoL is also greater in women.

Men and women may also differ in how they perceive, cope with, or respond to challenges, influenced by culturally shaped socialization processes (Beridze et al., 2020). Torres et al. (2024) observed lower levels of loneliness and QoL in women, although the relationship between these variables remained consistent across sex over time. These authors attributed their findings to different social mechanisms in men and women that may moderate the relationship between loneliness and QoL. However, Mayerl et al. (2024) found similar levels of loneliness in male and female older adults, but women tended to respond to loneliness with depressive symptoms more often than men. Tobiasz-Adamcyk et al. (2017) reported that men benefited more from social support, whereas women benefited more from social participation in relation to QoL. Furthermore, older women who were more resilient and who showed greater gratitude and acceptance also reported higher well-being and lower emotional distress compared to men (Pérez-Rojo et al., 2021). Nevertheless, specific social mechanisms by sex that influence QoL remain understudied and warrant further exploration (Mayerl et al., 2024; Torres et al., 2024).

Previous studies focused on the overall relationship between older adults' QoL and diseases, but the association between older adults' QoL and SDOHs is scarce. Within SDOHs, social connectedness shows an important relationship with older adults´ QoL, but the paths by which these two variables relate to each other are understudied neither the sex-specific social mechanisms. Therefore, the aim of this study was to examine how social connectedness (family function and loneliness) relates to QoL in community-dwelling older adults considering differences by sex. We also included psychological resources (acceptance, gratitude and resilience) and indicators of distress (anxiety and depression) and well-being (life purpose and personal growth).

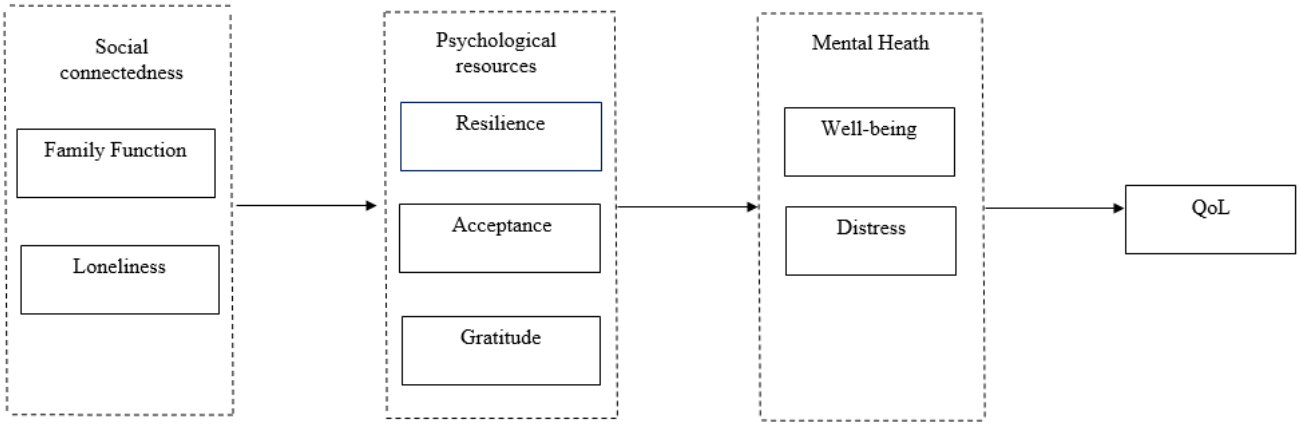
We hypothesized that loneliness would associate negatively with QoL while family function will show positive relations with QoL. However, these relationships are not expected to be direct, but rather indirect through psychological resources and indicators of distress and well-being. In addition, men and women are expected to differ in QoL (higher in men), loneliness (higher in women), and in the psychological resources they utilize (greater acceptance and gratitude in women) (see Figure 1).

Method

Participants

The inclusion criteria to participate in this study were: being 60 years or older, residing in Spain, and without a diagnosis of a neurological disease, severe psychopathological disorder, or any other condition incompatible with completing the questionnaires. Participants were 709 community-dwelling older adults aged 60 and above from Spain. Their mean age was 68.40 years (*SD* = 6.52), with

Figure 1
Hypothesized General Model for Men and Women



ages ranging from 60 to 94. Of the total sample, 55.4% were female and 44.6% male. Most participants were married (65.2%), while 13.8% were divorced, 12.3% were widowed, and 8.3% were single.

Instruments

Sociodemographic Data

Sex (men and women), age and marital status.

Loneliness

We used the Three-Item Loneliness scale (TIL-scale; Hughes et al., 2004). It consists of three items with response options on a three-point Likert scale. The scale achieved good psychometric properties in our sample (Cronbach's α=.84)

Family Function

It was assessed with the Family APGAR (Smilkstein, 1978). It is a 5-item scale that measures family adaptability, partnership, growth, affection and resolve which are scored in a 3-point Likert scale. It showed good reliability in our sample (Cronbach's α=.79).

Resilience

We used the Brief Resilient Coping Scale (Sinclair & Wallston, 2004). It is a 4-item scale in which participants are asked to score on a 5-point Likert scale. Good reliability in our sample was found (Cronbach's α=.84).

Gratitude

We used the gratitude subscale of the Values in Action Inventory of Strengths-Short Form (Littman-Ovadia, 2015). It is a 5-item scale with 5-point Likert scale response options. Good reliability in our sample was found (Cronbach's α=.97).

Acceptance

This variable was evaluated with the Acceptance and Action Questionnaire - II (AAQ-II) (Bond et al., 2011). This scale measures experiential avoidance and psychological inflexibility (the opposite of acceptance) with 7 items. This scale showed good internal consistency (Cronbach's α=.88).

Psychological Well-Being

We used Ryff´s psychological well-being scale (1989). Of the six subscales, we included personal growth (7 items) and purpose in life (6 items). Both subscales consist of a 7-point Likert scale. Personal growth (Cronbach's α=.69) and purpose in life (Cronbach's α=.79) achieved good reliability.

Distress

The Hospital Anxiety and Depression Scale (Zigmond & Snaith, 1983) was used. This is a 14-item scale with 4 response options divided into two subscales: anxiety (7 items) and depression (7 items). For this study we used the total score of distress which showed good reliability (Cronbach's α=.86).

Quality of Life

We used the 12 item CASP Scale (Higgs et al., 2003). This scale derives from the theory of human need satisfaction, including four domains in which each item is answered on a four-point Likert scale: control, autonomy, self-realization and pleasure. For this study we included the total score of the scale that achieved good reliability (Cronbach's α=.82).

Procedure

The study was first approved by Ethics Committee of Universidad San Pablo-CEU University Ethics Committee (reference 436/20/26).

The sample was collected through older adults' associations and organizations from several backgrounds and social networks using a non-probability snowball sampling strategy. Staff from the different associations and organizations facilitated first contact with the participants who met the inclusion criteria. Data was collected through a self-administered web-based survey. Participants were also offered a printed version of the questionnaire in case they preferred this other option.

All participants agreed to participate in the study and signed informed consent. They were informed of the aims of the study, the anonymous treatment of their data and the possibility of withdrawing the study anytime. They did not receive any incentive for participation.

Data Analysis

The variables were not normally distributed as shown by the Kolmogorov-Smirnov test. To analyze sex-based differences in the study variables, we conducted chi-square tests for categorical variables and Mann-Whitney U tests or independent samples *t*-tests for quantitative variables. Although some variables showed slight deviations from normality, the large sample size (n = 709) justifies the use of parametric tests based on the Central Limit Theorem, which states that the sampling distribution of the mean approaches normality as sample size increases, regardless of the shape of the population distribution. Furthermore, the *t*-test is considered robust to violations of normality and heteroscedasticity, particularly in large samples, and allows for the estimation of effect sizes (Cohen's *d*), which facilitates the interpretation of the magnitude of group differences (Field, 2013). We also conducted Spearman correlation coefficients (rho) to analyze possible associations between age and the outcome variables. To test whether the associations between variables differed significantly by sex, we conducted comparisons of correlation coefficients using Fisher's Z transformation.

We then performed a Path analysis to test the model hypothesized (figure 1). The associations between the assessed variables were tested separately for women and men. Following Byrne (2001) suggestion when having non-normal data, we used the Bollen-Stine (B-S) bootstrap test statistic. We used the fit indexes chi-square statistic (χ^2), the ratio of chi-square to degree of freedom (χ^2/gl), the goodness-of-fit index (GFI), the comparative fit index (CFI), the Tucker-Lewis Index (TLI), the normed fit index (NFI) and the Root Mean Square Error of Approximation (RMSEA). Direct and indirect effects were tested with bootstrapping as recommended by Preacher and Hayes (2004) for testing mediation, using 2,000 bootstrap samples and bias-corrected 95% confidence intervals. Separate models were specified for loneliness and family functioning as independent variables. Multigroup analysis was used for testing differences in the obtained paths across women and men, both for direct and indirect effects. The statistical packages SPSS 30 and AMOS 29 were used to do the analysis.

Results

Sex Differences in the Assessed Variables

The chi-square test revealed significant associations between sex and marital status in all categories except "widowed." Standardized residuals indicated that women were overrepresented in the "single" and "divorced" categories and underrepresented in the "married" category. Conversely, men were overrepresented in the "married" category and underrepresented in the "single" and "divorced" categories (Table 1).

Table 1

Descriptive Statistics and Group Comparisons by Sex (Categorical Variables)

Variable	Women		Men		χ^2 (gl)	*p*
	(n, %)	*SR*	*(n, %)*	*SR*		
Marital Status						
Single	51 (82.3)	2.8	11 (17.7)	-3.2	51.696 (3)	<
Married	212 (45.9)	-2.8	250 (54.1)	3.1		.001
Divorced	70 (71.4)	2.1	28 (28.6)	-2.4		
Widowed	60 (69)	1.7	27 (31)	-1.9		

Note. SR = Standardized Residual; Chi-square test includes degrees of freedom and p-value.

In addition, women reported higher levels of loneliness and lower scores on QoL compared to men, with small to moderate effect sizes. Although group differences in gratitude, acceptance, and family functioning were statistically significant with higher scores in men, the corresponding effect sizes were small (Table 2). In contrast, sex was not significantly associated with resilience, distress, or well-being.

Association Between the Assessed Variables by Sex

Table 3 shows the relationships between the assessed variables for men and women. Among men, older age was associated with greater resilience and lower well-being and QoL. Family function was positively and significantly associated with resilience, acceptance, well-being and QoL, and negatively with loneliness, gratitude and psychological distress. Loneliness was positively associated with distress and negatively with resilience, acceptance, well-being, and QoL. Gratitude was negatively related to resilience and well-being, and positively to QoL. Resilience was positively related to acceptance, well-being, and QoL, and negatively to distress. Acceptance was positively associated with well-being and QoL, and negatively with distress. Well-being was positively associated with QoL, and negatively with distress. Finally, distress and QoL were negatively associated.

Among women, older age was associated with lower levels of gratitude and QoL. Loneliness was related positively to gratitude and distress while negatively to resilience, acceptance, well-being and QoL. Gratitude was positively associated with distress, and negatively with resilience, acceptance and well-being. The remaining associations between variables mirrored those found in men, including the relationships between family function, loneliness, resilience, acceptance, distress, and QoL.

Of all the associations examined, only two showed statistically significant sex-based differences: the correlation between gratitude and acceptance (Z = -2.04; p < .05), and the correlation between gratitude and distress (Z = -0.34; p = .01), both of which were stronger among women.

Path Analysis

The hypothesized model (figure 1) did not show a good fit (χ^2 = 342,031; χ^2/gl = 13; p = .001; GFI = .90; CFI = .74; TLI = 44;

Table 2
Descriptive Statistics and Group Comparisons by Sex (Quantitative Variables)

Variable	*M*	*SD*	*Median*	*t(df)*	*p (t)*	*Cohen's d*	*Z (U)*	*p (U)*
Age								
Women	68.46	6.39	67	-.298	.383	-.022	.595	.552
Men	68.32	6.67	67	(707)				
Family Function								
Women	8.48	2.01	9	2.130	.017	.160	-2.387	.017
Men	8.79	1.88	10	(691.242)				
Loneliness								
Women	4.40	1.42	4	-5.203 (693.232)	<.001	-.390	5.725	.001
Men	3.86	1.29	3					
Acceptance								
Women	28.89	7.09	29	2.988	.001	.226	-2.979	.003
Men	30.47	6.82	32	(707)				
Gratitude								
Women	11.29	6.77	9	2.567 (649.29)	.005	.196	-2.019	.044
Men	12.67	7.34	10					
Resilience								
Women	15.08	3.29	15	-1.234 (707)	.109	-.093	1.03	.304
Men	14.77	3.48	15					
Well-Being								
Women	57.80	7.93	58	-.011	.496	-.001	-.289	.772
Men	57.99	9.15	58	(707)				
Distress								
Women	10.51	6.29	9	1.445 (598.501)	.075	.112	-.391	.696
Men	11.29	7.74	9					
QoL								
Women	32.49	7.34	32	3.931	<.001	.297	-3.561	.001
Men	34.77	8.13	34	(707)				

Table 3
Spearman Correlations Among the Assessed Variables

Variable	1	2	3	4	5	6	7	8	9
Men									
1. Age	—								
2. Family Function	.039	—	.						
3. Loneliness	-.001	-.375***	—						
4. Gratitude	-.033	-.149**	.048	—					
5. Resilience	.181***	.163**	-.174**	-.126*	—				
6. Acceptance	-.104	.163**	-.343***	-.060	.369***	—			
7. Well-Being	-.219***	.216***	-.156**	-.118*	.546***	.420***	—		
8. Distress	.042	-.291***	.236***	-.089	-.249***	-.276***	-.289***	—	
9. QoL	-.253***	.190***	-.289***	.204**	.364***	.357***	.429***	-.384***	—
Women									
1. Age									
2. Family Function	-.059	—							
3. Loneliness	.047	-.408***	—						
4. Gratitude	-.138**	-.149**	.130**	—					
5. Resilience	.088	.104**	-.192***	-.210***	—				
6. Acceptance	-.007	.343***	-.402***	-.155***	.342***	—			
7. Well-Being	-.082	.258***	-.261***	-.192***	.417***	.378***	—		
8. Distress	.039	-.226***	.319***	.191***	-.337***	-.498***	-.397***	—	
9. QoL	-.104*	.330***	-.301***	-.058	.274****	.391***	.421***	-.361**	—

***$p < .001$; **$p < .01$; *$p < .05$

NFI = .44; RMSEA = .189; *B-S bootstrap* was significant, $p = .001$; 95% *Confidence Interval*). To increase the degrees of freedom, we eliminated non-significant paths and included modifications in the model following the suggestions of the modification indices, which were applied based on theoretical justification. At each step, we removed one parameter at a time, prioritizing those that most improved model fit, until a satisfactory fit was achieved (Jöreskog, 1993). Each modification was evaluated in light of the theoretical framework of the study, ensuring that the changes were not solely data-driven but also conceptually coherent. The final model showed an excellent fit for both groups ($\chi^2 = 12.006$; $\chi^2/gl = 9$; $p = .213$; *GFI* = .99; *CFI* = .99; *TLI* = 99; *NFI* = .99; *RMSEA* = .022; *B-S bootstrap* was non-significant, $p = .249$; 95% *Confidence Interval*), explaining 43% of the QoL variance for women and 45% for men (figure 2).

For men, all associations included in the final model were significant, except for the relationship between family function and acceptance. For women, the relationships between family function and resilience, family function and distress, and distress and well-being were not significant. Regression weights for men and women are presented in Table 4.

We then constrained the individual paths to test for group differences. Results showed a significant decrease in model fit between the unconstrained and the constrained models for the following paths suggesting differences between men and women: 1) The association between family function and distress was significant for men but not for women (*CMIN* = 84.99; $p = .004$); 2) The relationship between acceptance and distress was significant in both groups but stronger in women (*CMIN* = 6.045; $p = .014$); 3) Family function and resilience were significantly associated in men but not in women (*CMIN* = 6.519; $p = .011$); 4) the relationship between resilience and well-being was significant in both groups but stronger in women (*CMIN* = 4.135; $p = .042$). No other significant differences between direct paths when comparing the unconstrained model with the structural weights model.

Table 4

Differences Between Women and Men in Unstandardized Regression Weights

			Women		Men	
			RW	*SE*	*RW*	*SE*
Family function	→	Resilience	.017	.091	.386***	.112
Loneliness	→	Resilience	-.407**	.129	-.324*	.164
Family function	→	Acceptance	.761***	.170	.265	.199
Loneliness	→	Acceptance	-1.176***	.244	-1.768***	.287
Resilience	→	Acceptance	.636***	.095	.568***	.098
Family function	→	Distress	-.222	.143	-1.012***	.229
Acceptance	→	Distress	-.330***	.043	-.136*	.066
Resilience	→	Distress	-.402***	.088	-.292*	.128
Family function	→	Well-Being	.630***	.180	.460*	.232
Acceptance	→	Well-Being	.201***	.058	.295***	.065
Distress	→	Well-Being	-.094	.063	-.109*	.055
Resilience	→	Well-Being	.814***	.113	1.160***	.127
Resilience	→	Gratitude	-.327***	.103	-.238*	.118
Loneliness	→	QoL	-.690**	.220	-.907***	.282
Acceptance	→	QoL	.103*	.051	.232***	.057
Well-Being	→	QoL	.314***	.040	.263***	.040
Distress	→	QoL	-.299***	.053	-.181***	.044
Gratitude	→	QoL	.351***	.043	.468***	.044
Family function	→	Loneliness	-1.269***	.158	-1.092***	.149

Note. *RW* = regression weights; *SE* = standard error.

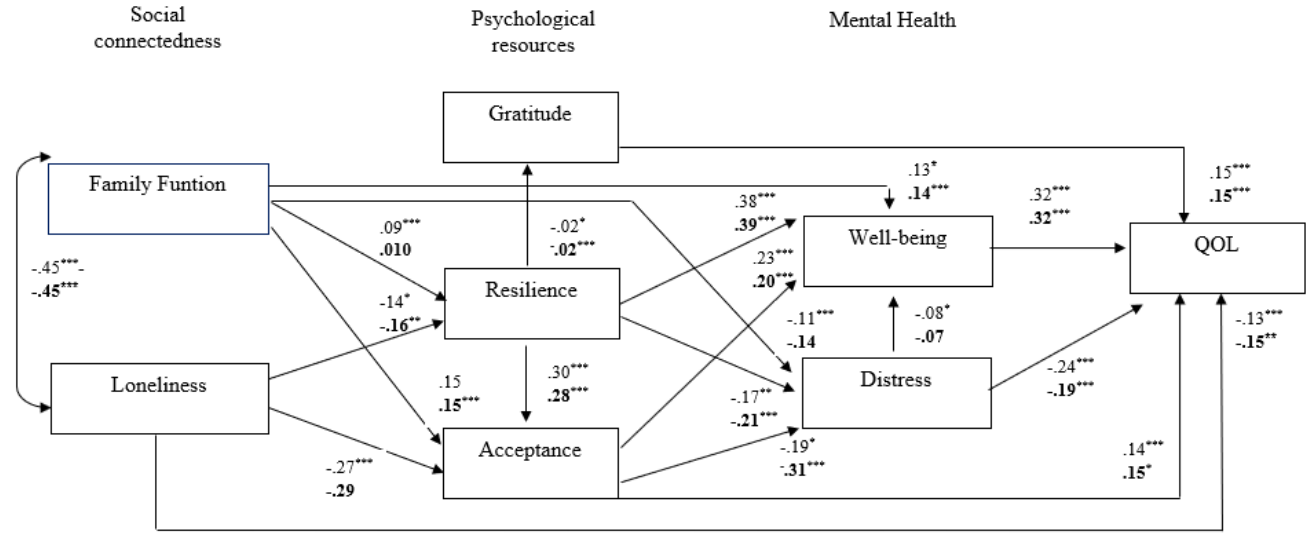
***$p < .001$; **$p < .01$; *$p < .05$

The bootstrap analysis was conducted at two levels to examine the mediating mechanisms linking key predictors to QoL. The first level focused on the mediators between family function and QoL, while the second level explored the mediators between loneliness and QoL. Results for each model are presented separately (tables 5 and 6).

Family function showed a total indirect effect on QoL, with no direct effect in either group. In women, the most prominent mediating pathway was through well-being (41.34%) and acceptance (16.28%). In addition to their individual effects, combined mediational pathways involving acceptance and distress (15.66%), as well as acceptance and well-being (10.02%), also showed significant contributions to the overall model. In men, the strongest mediators

Figure 2

Path Analysis With Standardized Regression Weights for Women (in bold) and Men.



Note. The errors have been omitted for ease of presentation.

Table 5
Distribution of Effects and Mediated Pathways from Family Function to Quality of Life (Standardized Effects)

	Family Function effects on QoL for women					Family Function effects on QoL for men				
	Bootstraps		IC95%			Bootstraps		IC95%		
	Effect	*SE*	*LL*	*UL*	*%*	*Effect*	*SE*	*LL*	*UL*	*%*
Total Effect	.479***	.105	.286	.700	100	.550***	.139	.307	.868	100
Direct Effect	.000	.000	.000	.000	0	.000	.000	.000	.000	0
Indirect Effect	.479***	.105	.286	.700	100	.550***	.139	.307	.868	100
Indirect Effect Pathways										
1. Family function → Well-being → QoL	.198***	.061	.096	.341	41.34	.121	.079	-.021	.296	22
2. Family function → Distress → QoL	.066	.046	-.013	.170	13.78	.183***	.058	.090	.319	33.27
3. Family function → Distress → Well-being → QoL	.000	.003	-.009	.004	0	-.011*	.008	-.034	-.001	2
4. Family function → Resilience → Well-being → QoL	.004	.022	-.035	.052	.84	.118***	.048	.047	.246	21.45
5. Family function → Resilience → Distress → QoL	.002	.011	-.018	.026	.42	.020*	.014	.003	.064	3.64
6. Family function → Resilience → Distress → Well-Being → QoL	.000	.001	-.002	.004	0	.003*	.003	.000	.016	.55
7. Family function → Resilience → Acceptance → QoL	.001	.007	-.009	.020	.21	.051**	.028	.012	.132	9.27
8. Family function → Resilience → Acceptance → Well-Being → QoL	.001	.004	-.006	.009	.21	.017**	.010	.005	.046	3.09
9. Family function → Resilience → Acceptance → Distress → QoL	.001	.006	-.009	.014	.21	.005**	.004	.001	.018	.90
10. Family function → Resilience → Acceptance → Distress → Well-Being → QoL	-.001	.003	-.009	.005	.21	-.005	.004	-.020	.000	.90
11. Family function → Resilience → Gratitude → QoL	-.002	.010	-.026	.016	.42	-.043*	.030	-.125	-.003	7.82
12. Family function → Acceptance → QoL	.078*	.047	.006	.186	16.28	.062	.058	-.025	.214	11.27
13. Family function → Acceptance → Well-Being → QoL	.048***	.021	.018	.103	10.02	.021	.024	-.009	.093	3.82
14. Family function → Acceptance → Distress → QoL	.075***	.026	.036	.145	15.66	.007	.008	-.002	.035	1.27
15. Family function → Acceptance → Distress → Well-Being → QoL	.007	.005	-.002	.021	.001	.001	.002	.000	.009	.18

Notes. SE = Standard Error; *95% CI* = 95% Confidence Interval of the effect; *LL* = Lower Limit of the CI; *UL* = Upper Limit of the CI; *%* = Percentage of the effect attributed to each source.

Table 6
Distribution of Effects and Mediated Pathways from Loneliness to Quality of Life (Standardized Effects)

	Loneliness effects on QoL for women					Loneliness effects on QoL for men				
	Bootstraps IC95%					Bootstraps IC95%				
	Effect	*SE*	*LI*	*LS*	*%*	*Effect*	*SE*	*LI*	*LS*	*%*
Total Effect	-1.260***	.276	-1.791	-.698	100	-1.693***	.285	-2.255	-1.138	100
Direct Effect	-.690*	.249	-1.148	-.160	54.76	-.907**	.290	-1.449	-.301	53.57
Indirect Effect	-.569***	.140	-.147	-.056	45.16	-.786***	.178	-1.177	-.485	46.43
Indirect Effect Pathways										
1. Loneliness → Acceptance → QoL	-.121*	.071	-.297	-.297	9.60	-.411***	.166	-.828	-.150	24.28
2. Loneliness → Acceptance → Distress → QoL	-.116***	.041	-.216	-.216	9.21	-.044*	.025	-.111	-.007	2.59
3. Loneliness → Acceptance → Distress → Well-Being → QoL	-.011	.009	-.033	-.033	0.79	-.007*	.006	-.028	.000	0.41
4. Loneliness → Acceptance → Well-Being → QoL	-.074***	.031	-.151	-.151	5.87	-.137***	.060	-.275	-.044	8.09
5. Loneliness → Resilience → Distress → QoL	-.049***	.026	-.119	-.119	3.89	-.017*	.014	-.063	-.001	0.41
6. Loneliness → Resilience → Well-Being → QoL	-.104***	.043	-.212	-.212	8.25	-.099*	.059	-.242	-.003	5.85
7. Loneliness → Resilience → Distress → Well-Being → QoL	-.005	.005	-.022	-.022	0.39	-.003*	.003	-.017	.000	0.18
8. Loneliness → Resilience → Gratitude → QoL	.047**	.026	.012	.012	3.73	.036	.031	-.001	.134	2.13
9. Loneliness → Resilience → Acceptance → QoL	-.091***	.039	-.191	-.191	7.22	-.086*	.052	-.212	-.001	5.08
10. Loneliness → Resilience → Acceptance → Well-Being àQoL	-.016***	.009	-.043	-.043	1.27	-.014*	.012	-.049	.000	0.82
11. Loneliness → Resilience → Acceptance → Distress → QoL	-.026***	.012	-.059	-.059	2.06	-.005*	.004	-.020	.000	0.29
12. LonelinessàResilience → Acceptance → Distress → Well-Being → QoL	-.003	.002	-.009	-.009	0.24	-.001*	.001	-.006	.000	0.06

Notes. SE = Standard Error; *95% CI* = 95% Confidence Interval of the effect; *LL* = Lower Limit of the CI; *UL* = Upper Limit of the CI; *%* = Percentage of the effect attributed to each source.

were distress (33.27%) and resilience (21.45%). Notably, resilience acted as a mediator in close association with well-being.

In both groups, the total effect of loneliness on QoL was similarly distributed between the direct effect (54.76% in women; 53.57% in men) and the indirect effect (45.16% in women; 46.43% in men), indicating that mediation processes play a substantial role in the relationship.

Among the mediators, acceptance stood out, especially in men, where it accounted for 24.28% of the total effect, compared to 9.60% in women. Distress (through acceptance) carried significantly more weight in women (9.21%) than in men (2.59%). Well-being emerged as a relevant mediator in both sexes, although through different pathways. In men, it was mainly linked to acceptance (8.09%), whereas in women it was associated with both acceptance and resilience (5.87% and 8.25%, respectively). Resilience played an important mediating role in women, with several active pathways that together accounted for more than 20% of the total effect, while in men its contribution was more limited and concentrated. However, in men, the effect was channeled primarily through fewer but stronger pathways, notably acceptance. In contrast, women exhibited a more distributed and multifaceted mediation structure, involving resilience, distress, and gratitude.

When analyzing the distribution of pathways suggests that men relied more on psychological well-being and acceptance, whereas women showed stronger mediation through distress, and resilience combined with well-being. Several compound pathways involving resilience, acceptance, and distress contributed modestly to both groups, with slightly more diversity in women´ mediation structure.

Discussion

This study aimed to analyze sex differences in the associations between social connectedness (loneliness and family function) and QoL in a dwelling community sample of older adults in which psychological resources (i.e., acceptance, resilience and gratitude) and mental health indicators (i.e., well-being and distress) were considered mediators. The model suggests a possible theoretical direction in line with the stress and coping model (Lazarus & Folkman, 1984) and enhances the association between SDOH older people's functioning and QoL (Gu et al., 2019). However, this cannot be empirically confirmed with the current design as this is a cross-sectional study.

In line with previous literature, our results support that women are more vulnerable than men by reporting lower levels of Qol (Beridze et al., 2020; Torres et al., 2024) and more loneliness (Beridze et al., 2020), with small to moderate effect sizes. Family function (Lu et al., 2017), acceptance (Panayiotou et al., 2017) and gratitude were also significantly higher in men but here the effects were small, indicating that the practical impact of this difference may be limited. In contrast, distress, well-being and resilience were not associated with sex.

In older adults, sex-based differences tend to be more pronounced in variables such as loneliness and QoL, likely due to the cumulative impact of gendered life experiences over the lifespan. These findings can be also attributed to the larger proportion of older women within the social structure in the later stages of life, mostly widowed, divorced and/or living alone which, in turn, is associated with more vulnerability (Tobiasz-Adamczyk et al., 2017). In our sample there was overrepresentation of single and divorced women and married men. Moreover, Eagly's (1987) social role theory, in which social behaviors are related to social roles, enhances that women are more expected to behave in the interest of the family over their self-care and well-being and tend to develop more often caregiving roles, interfering with other social roles. Therefore, married men generally tend to receive more emotional and health behaviors support. In contrast, variables such as gratitude, acceptance, and family functioning may be more influenced by individual traits, coping styles, or cultural norms that are less sharply divided by sex in later life. Although statistically significant, the smaller effect sizes suggest that these differences, while present, may not reflect substantial disparities in lived experience or well-being.

When comparing the correlations among the study variables between men and women, most patterns of association were consistent across groups. However, stronger correlations were observed in women between gratitude and acceptance, and between gratitude and distress. These results indicate that gratitude may play a more central role in emotional regulation and psychological adjustment among older women. The stronger association between gratitude and acceptance in women could reflect a greater tendency to integrate positive emotional experiences with psychological flexibility. Similarly, the stronger inverse relationship between gratitude and distress among women may indicate that gratitude serves as a more effective buffer against negative emotional states in this group. These sex-based differences highlight the importance of considering sex as a moderating factor in the study of positive psychological constructs (Yue et al., 2017).

After adjusting the model to improve fit, a significant association emerged between social connectedness, measured through family function and loneliness, and QoL. We then identified different mediation pathways in the model, first, those in which family function acted as the independent variable, and second, those in which loneliness served as the predictor. Additionally, differences in the specific paths were observed between men and women.

The first set of pathways that examined the role of family function on QoL and its mediators showed a positive association with QoL, and this relationship was fully mediated by psychological resources and mental health for both women and men.

Regarding the role played by psychological resources, acceptance was directly related to family function in women while in men it wasn't. Moreover, acceptance emerged as the mediator with the highest percentage of effect in women, compared to the other psychological resources analyzed (i.e., gratitude and resilience). In men, acceptance also showed an indirect effect, but only when combined with resilience. In fact, resilience was the main psychological resource mediating the relationship between family function and QoL in men. In contrast, no direct association between resilience and family function was found in women.

These differences may reflect gendered patterns of socialization and how men and women perceive and utilize family support. Women are typically socialized to value family and interpersonal support more positively, while men are often socialized to prioritize economic provision over emotional engagement and caregiving (Aranda et al., 2001). Therefore, men may need to strengthen their resilience before translating family support into effective coping strategies.

Regarding the role of mental health indicators (i.e., distress and well-being), they showed direct and indirect associations with QoL. First, men exhibited a direct negative association between family function and distress, while in women there wasn´t any direct association. Second, both groups showed direct and positive

relations between family function and well-being. These findings align with gendered expectations: women who fulfill social roles related to maintaining social connections may experience increased well-being, while men lacking social support may experience heightened distress and decreased well-being (Aranda et al., 2001). Third, distress associated with well-being in men but not in women. This may be due to men being less likely to seek help or express emotional needs, thereby amplifying the impact of distress on their well-being (Seidler et al., 2016).

Additionally, distress and well-being acted as mediators but always combined with resilience or acceptance, with differences by sex. On the one hand, the combination of resilience with well-being as mediators, between family function and QoL, and resilience and distress were only significant for men. On the other hand, the combination of acceptance with distress and acceptance with well-being were only significant mediators for women. As we mentioned before, resilience seems to be more relevant for men when analyzing the relationship between family function and QoL, while acceptance was more relevant for women.

The second set of pathways explored the role of loneliness on QoL, considering its mediators**.** Results revealed partial mediation with comparable proportions of direct and indirect effects.

On the one hand, analysis showed a negative direct effect of loneliness on QoL for both women and men. This finding is consistent with previous studies showing that loneliness negatively affects QoL (Gerino et al., 2017).

On the other hand, analysis of the indirect effects revealed acceptance as the most relevant mediator between loneliness and QoL in men. In women, however, the mediation structure was more complex and distributed, with resilience playing a prominent role alongside other psychological resources.

When mental health indicators were considered, both well-being and distress showed significant associations in both groups, although the pathways differed. First, the combination of resilience and well-being as mediators showed a significantly stronger relation in women, suggesting that these resources jointly contribute to buffering the negative impact of loneliness. Second, the path combining acceptance and distress, the effect was significant in both groups, but notably stronger in women. indicating that acceptance may help women manage the emotional burden of loneliness more effectively. Third, the combination of acceptance and well-being was associated with improved QoL in both sexes, reinforcing the role of acceptance as a general protective factor.

These findings suggests that while both acceptance and resilience are beneficial for older adults, women may benefit more from acceptance in reducing distress, and from resilience in enhancing well-being (Krok-Schoen et al., 2023), whereas men may benefit more directly from acceptance as a cognitive coping strategy.

Differences in these mediation patterns may be explained by socialization processes and life course experiences of the two sexes. Women, traditionally socialized to value emotional expression and interpersonal relationships (Eagly, 1987), may experience loneliness more intensely due to the disruption of social networks (Torres et al., 2024), which in turn may affect their perceived resilience. In this context, acceptance may serve as a key emotional resource to cope with loss and changes in social connections, helping to mitigate distress and maintain well-being (Zarling et al., 2023). Given that social networks are more valued by women due to gender socialization (Eagly, 1987), older women may be more negatively affected by loneliness (Torres et al., 2024), which in turn may reduce their perceived resilience. Acceptance may help older adults cope with aging-related challenges such as loss and changes in social connections (Zarling et al., 2023).

Overall, these findings highlight the importance of tailoring interventions to pathways of psychological adjustment in older adults by sex, particularly in promoting resilience and acceptance to enhance their QoL.

Limitations should be noted. First, this is a convenience sample of older adults from Spain. Therefore, caution is advised when generalizing the results, as they may not be applicable to larger populations or from different backgrounds. Second, this is a cross-sectional study, which does not allow us to establish causal or directional relationships between variables. Therefore, the results should be interpreted as associations between constructs rather than as predictive or explanatory effects. Future longitudinal studies are needed to examine the temporal and potentially causal relationships among the variables, enabling a more robust evaluation of the proposed mediation pathways and the directionality of effects. Third, the survey was self-administered, which can be associated with biases in the interpretation of the items or that the older adults who responded were those more motivated or who had fewer issues with social connectedness or QoL. Fourth, the number of sociodemographic variables (age, sex and marital status) was limited. Educational level, socioeconomic status, income and gender identity could provide a more comprehensive understanding of participant characteristics. Future research must incorporate a broader range of sociodemographic indicators to better contextualize sex-based differences in psychological and well-being outcomes and more inclusive measures to better capture the complexity of gender.

Although Social Determinants of Health (SDOH) play a decisive role in older people's QoL, there is a gap in the analysis of the association between older adults' QoL and SDOHs. While social connectedness, one of the SDOH factors, shows a relevant association with older adults' QoL, the paths by which these two variables relate to each other are understudied, particularly the different social mechanisms by sex. Our findings aim to help clarify some of these relationships. One of the main contributions of this article is to show how women and men perceive and cope with social connections differently.

Another significant contribution of this study is the focus on personal resources that play a key role in social connectedness and QoL in older adults, highlighting the differences in these relationships by sex. There are different studies that highlight the importance of sex in the study of quality of life. For example, Jeong and Lee (2020) found the importance of sex-specific interventions to improve quality of life in older people with chronic musculoskeletal pain. Stalling et al. (2024) showed that although women had higher life expectancy, they had also more physical and functional problems and as result less QoL.

Finally, the study underscores the importance of developing specific interventions by sex, as the relationship between social connectedness and QoL is mediated by different personal resources in older women and men. While acceptance and well-being can be promoted in women, resilience and distress should be aims to work in

men to increase the impact of family function on QoL. Interventions that aim to reduce the impact of loneliness on QoL, gratitude and resilience promotion seem to be especially relevant for women.

Author Contributions

Cristina Noriega: Conceptualization, Data curation, Methodology, Formal analysis, Investigation, Methodology, Writing - Original draft, Writing - Review and editing. **Gema Perez-Rojo:** Study conceptualization, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Supervision, Writing - Original draft, Writing - Review and editing. **Pablo Medrano-Martínez:** Investigation, Methodology, Writing - Original draft, Writing - Review and editing. **Javier Lopez:** Study conceptualization, Formal analysis, Investigation, Methodology, Writing - Original draft, Writing - Review and editing.

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Declaration of Interests

The authors declare that there is no conflict of interest.

Data Availability Statement

Data analyzed herein are available in https://osf.io/azx9j/.

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Article

Internet Habits, Problematic Internet Use, and Online Risk Practices Among Adolescents With ADHD in Spain

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ABSTRACT

Background: In recent years, there has been growing scientific concern about digital habits, online risk practices and problematic internet use (PIU) among adolescents with attention deficit hyperactivity disorder (ADHD). This exploratory study aims to compare: (1) internet use habits; (2) PIU; and (3) online risk practices (i.e., active and passive sexting, sextortion, pornography consumption, online gambling, and contact with strangers) among adolescents with and without ADHD. **Method:** A school-based sample of 4,359 adolescents aged 12-18 years old (M = 14.79, SD = 1.79; 51.1% girls; 5.9% ADHD) was assessed (intentional sampling). **Results:** The results indicated that adolescents with ADHD had different Internet and video game use habits, as well as a significantly higher rate of PIU compared to their peers without ADHD (25.8% vs. 18%). They also had a higher rate of sextortion, online gambling, and pornography use. In addition, significant gender differences of particular interest were observed. **Conclusions:** These findings underline the need to address the particularities of adolescents with ADHD and their environment in order to promote safer use of the technology.

Hábitos de Uso de Internet, Uso Problemático de Internet y Conductas de Riesgo Online en Adolescentes con TDAH en España

Palabras clave:
Comportamiento adolescente
Trastorno por Déficit de Atención con Hiperactividad
Conducta online
Adicción a internet

RESUMEN

Antecedentes: En los últimos años, ha aumentado la preocupación por los hábitos digitales, prácticas de riesgo *online* y uso problemático de Internet (UPI) entre adolescentes con trastorno por déficit de atención e hiperactividad (TDAH). Este estudio exploratorio tiene como objetivo comparar: (1) hábitos de uso de internet; (2) UPI; y (3) prácticas de riesgo *online* (*sexting* activo y pasivo, sextorsión, consumo de pornografía, juego de azar *online* y contacto con desconocidos) entre adolescentes con y sin TDAH. **Método:** Para ello, se evaluó una muestra escolar de 4359 adolescentes de 12 a 18 años (M = 14,79; DT = 1,79; 51,1% chicas; 5,9% TDAH) (muestreo intencionado). **Resultados:** Los resultados indicaron que los y las adolescentes con TDAH tenían hábitos de uso de Internet y videojuegos diferentes, así como una tasa de UPI significativamente más alta en comparación con sus pares sin TDAH (25,8% vs 18%). También presentaron una mayor tasa de sextorsión, participación en juegos de azar *online* y consumo de pornografía. Además, se observaron diferencias de género significativas y de particular interés. **Conclusiones:** Estos hallazgos subrayan la necesidad de abordar las particularidades de las y los adolescentes con TDAH y su entorno, con el fin de promover un uso de la tecnología más seguro.

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The Internet is an undeniable part of the adolescents' lives. According to the report *Impact of Technology on Adolescence: Relationships, Risks, and Opportunities* (Andrade et al., 2021), 90.8% of adolescents in Spain connect to the Internet daily, 49.6% do it more than 5 hours a day during the weekend, and 21.6% use it every day after midnight. The incorporation of digital technologies into daily life has transformed the processes of communication and social interaction, in such a way that Information and Communication Technologies [ICT] have begun to be called Relational, Information and Communication Technologies [RICT], so that they emphasize the relational dimension of their application and use (Gabelas et al., 2015). This new context has modified the dynamics of adolescents' interaction, learning, searching for information, and entertainment; producing both opportunities and risks (Jiménez-Iglesias et al., 2018). In fact, according to the most recent EU Kids Online report, 34% of teens have experienced negative situations on the Internet (Smahel et al., 2020).

One of the potential risks from misuse of RICT is Problematic Internet Use [PIU]. PIU is a pattern of behaviour in which Internet use becomes excessive, impulsive, and maladaptive, negatively affecting a person's daily functioning (Spada, 2014). More recently, PIU has been defined as such use of the internet and social media characterized by a high degree of interference in daily life, with an impact on personal, family, academic, or work life, and possibly accompanied by clinical symptoms (Andrade et al., 2021). Although other terms have been used to refer to it (e.g., compulsive use of the Internet, Internet addiction, pathological use of the Internet...), PIU has been gaining acceptance by not making assumptions about nosology or the causal mechanisms that underlie it (Fineberg et al., 2022). Unlike traditional addictions, this behaviour is associated with addictive characteristics of the Internet, such as accessibility, anonymity, and convenience (Fineberg et al., 2018; Moretta et al., 2022). PIU is associated with adverse consequences in interpersonal relationships (Al-Kandari & Al-Sejari, 2021), academic performance (Aznar-Díaz et al., 2020), sleep hygiene (Kokka et al., 2021), eating habits (Tayhan-Kartal & Yabanci-Ayhan, 2021), body perception (Rial, 2022) psychological well-being (Herruzo et al., 2023; Vázquez-Martínez et al., 2024), and overlaps with other addictions and mental disorders (Lanthier-Labonté et al., 2020; Liñares, 2023; Panova & Lleras, 2016).

Adolescents constitute the population group with the highest frequency of connection and hours of Internet use; and, therefore, with a higher risk of developing a PIU (Choi et al., 2017; Rozgonjuk et al., 2018). In Spain, 33.1% of adolescents show a PIU (Andrade et al., 2021), ranking above the European average (Meng et al., 2022). In addition, although the use of RICT and the prevalence of PIU is slightly higher among adolescents' girls (Pérez-Sáenz et al., 2023; Rial, 2022), the role of gender in this phenomenon has not yet been determined (Lukács, 2021).

Risky online behaviours are more prevalent among adolescents who engage in abusive Internet use (Andrade et al., 2021). Among these risk practices, gaming (Martín-Fernández et al., 2017), online gambling (Tran et al., 2024), grooming (Schoeps et al., 2020), sexting (Burén & Lunde, 2018), sextortion (Kopecký, 2017) and cyberbullying (Garaigordobil, 2015) are commonly cited. In relation to these behaviours, the literature points out that gender plays a crucial role in its prevalence. For example, adolescent girls tend to have higher prevalence of social media use and problematic behaviours related to social interaction, while boys show a higher tendency toward video game addiction and pornography consumption (Andreassen et al., 2016). Therefore, addressing risky practices online requires approaching the issue from a gender perspective.

The presence of previous or latent psychological disorders has been linked to an increased risk of developing PIU (Xue et al., 2023). In this context, ADHD stands out as a significant factor, given its high prevalence and early onset (Danielson et al., 2024), which also affects approximately twice as many boys as girls (Ayano et al., 2023). Recent meta-analyses estimate the global prevalence of ADHD in children and adolescents at 8.0 % (95% confidence interval (CI): 6.0–10 %) (Ayano et al., 2023), and at 5.6% (95% CI: 4.8-7%) in adolescents aged 12 to 18 years old (Salari et al., 2023). In Spain, the diagnosis of this disease is clinical and typically occurs during paediatric ages, so its approach and management begin from Primary Care services (Vázquez et al., 2022). According to the meta-analysis by Catalá-López et al. (2012), ADHD affects 6.8% of Spanish children and adolescents (95% CI: 4.9 – 8.8%). A more recent study by Canals et al. (2020) estimates its prevalence at 5.5% in school-age children.

Accumulating evidence over the past decade highlights that adolescents with ADHD are particularly vulnerable to developing PIU (Aznar et al., 2020, Kim et al., 2019; Yen et al., 2014). This susceptibility is attributed to traits such as low frustration tolerance, impulsivity, and learning difficulties (Enagandula et al., 2018; Weinstein et al., 2015). Recent studies suggest that the immediate gratification and high stimulation offered by digital environments such as RICT aggravate their vulnerability (Ra et al., 2018). The COVID-19 pandemic may have further intensified this issue, leading to increased engagement in Internet use and video gaming among adolescents with ADHD (Sciberras et al., 2022). In addition, Augner et al. (2023) indicate that significant correlations between PIU and ADHD symptoms show more pronounced effect sizes in males.

Although previous research has extensively examined risky online behaviours in general adolescent populations, studies specifically focusing on adolescents with psychological disorders remain relatively scarce (Xue et al., 2023). Adolescents with ADHD frequently encounter challenges in interpersonal relationships and struggle with emotional dysregulation, which may lead them to rely more heavily on online interactions as a coping mechanism (Yen et al., 2014). Among the various risky online behaviours, probably the association between ADHD and participation in online gambling has garnered the most substantial evidence (Derin et al., 2023; Hellström et al., 2017). This phenomenon is especially serious, as children and adolescents with ADHD take more risks in gambling due to alterations in reward and decision-making mechanisms (Groen et al., 2013; Rubiales et al., 2017). Other studies have also highlighted higher rates of sexual abuse *online* and passive sexting among adolescents and young people with ADHD (Ozdag et al., 2025), as well as of pathological consumption of pornography (Niazof et al., 2019). The neuropsychological characteristics of the disorder, such as impulsivity and sensitivity to rewards, also make it especially vulnerable to highly stimulating environments designed to reinforce compulsive behaviours such as online video games (Isorna et al., 2024). Therefore, Salerno et al. (2022) have found that multiple symptoms of ADHD can be risk factors for video game addiction in adolescence, although they do not rule out a bidirectional relationship between the two conditions.

A final point to consider is the disparity between the substantial volume of international research and the limited number of recent studies focusing on Internet use habits, PIU, and online risk behaviours among Spanish adolescents with ADHD. In this regard, the study of San Mauro et al. (2021) notes that the rate of Internet use of more than three hours a day is significantly higher in children and adolescents with ADHD. Also, in a case-control study, Menéndez-García et al. (2022) conclude that ADHD is a risk factor for the development of Internet addiction. Therefore, this paper seeks to contribute to a more comprehensive description and understanding of this issue within the Spanish context. This study is part of a line of research on TRIC and behavioral addictions among adolescents, with a special emphasis on exploring possible vulnerability profiles. The research questions to be addressed would be: Have boys and girls with ADHD higher levels of engaging in risky practices in the digital environment? Can these risks extend to a maladaptive pattern involving higher PIU? The underlying hypothesis, as previously noted in the literature, is that those with ADHD would exhibit higher levels of risky practices and PIU.

Consequently, the main objective of this study is to compare adolescents with and without ADHD in relation to their RICT use habits, the prevalence of PIU and their involvement in risky online practices, such as sexting, sextortion, pornography consumption, gambling and online contact with strangers. Also, due to gender differences noted in the literature, differences between males and females are analysed for every variable.

Method

Participants

To address the objectives indicated, a cross-sectional study was developed. A selective methodology was used by conducting a survey in 23 public schools in Santiago de Compostela and surrounding areas. Intentional sampling was used to select the schools and participants, ensuring geographical representativeness and educational diversity (secondary school, Baccalaureate and Vocational Training [VT]). The inclusion criteria required that the student body be within 12 to 18 years. Although the sampling was non-probabilistic, its size and diversity allow us to approximate a representativeness of the regional context.

The initial number of participants was 4,524. However, 165 were eliminated because they contained incoherent response patterns, an excess of missing values or were outside the age range under study (12-18 years). The final sample consisted of 4,359 students (M = 14.79; SD = 1.79; 51.2% girls). Of the total, 34.5% were in the 1st and 2nd year of secondary school, 33.5% were in 3rd and 4th of secondary school, 30.1% Baccalaureate and 1.9% were students of VT.

Among participants, 5.9% of adolescents (n = 256) reported having been diagnosed with ADHD by the Spanish National Health System (SNHS). This percentage showed statistically significant differences by gender: 8.1% of boys reported having ADHD (n = 172), compared to 3.8% of girls (n = 84) (χ^2 = 36.82; p < .001). There were no statistically significant age differences between the group of adolescents with and without ADHD (14.98 vs. 14.78; t = -1.87; p > .05). Descriptive data about the total sample and both sub-samples are collected in Table 1.

Table 1
Descriptive Data About the Total Sample and Sub-samples

	TOTAL SAMPLE n (%)	ADHD n (%)	No ADHD n (%)
TOTAL	4,359 (100)	256 (5.9)	4,103 (94.1)
Boys	2,127 (48.8)	172 (8.1)	1,955 (91.9)
Girls	2,232 (51.2)	84 (3.8)	2,148 (96.2)
1st and 2nd year of Secondary school	1,502 (34.5)	90 (5.9)	1,412 (94.1)
3rd and 4th of Secondary school	1,465 (33.6)	101 (6.9)	1,364 (93.1)
Baccalaureate	1,309 (30)	56 (4.3)	1,253 (95.7)
Vocational Training	83 (1.9)	9 (10.8)	74 (89.2)

Instruments

The data were collected through an *ad hoc* questionnaire that included questions grouped into 3 blocks. The first block was dedicated to knowing the habits of Internet use (i.e., connection frequency (*How often do you connect to the internet?*), daily connection time (*How many hours a day do you usually use the Internet?)* and connection schedules (*Do you usually connect to the Internet or use your smartphone after midnight?*), use of online video games (*How often do you play online video games?*), and problematic behaviours associated with it (i.e., sexting (*Have you ever sent photos or videos of yourself with erotic or sexual content to another person via the Internet or smartphone?*), sextortion *(Have you ever been blackmailed with the threat of publishing and spreading photos or videos of you with erotic or sexual content on the internet?)*, online gambling (*In the last year, have you bet money on online gambling or betting websites?*), contact with strangers (*In the last year, have you contacted strangers via the Internet, chat rooms, or social media?*) and pornography consumption (*In the last year, have you visited websites with erotic or pornographic content?*). These questions are based on those used by previous reference studies (Andrade et al., 2021).

The second block included the Problematic Internet Use Scale in adolescents [PIUS-a] (Rial et al., 2015), an instrument developed specifically for the Spanish adolescent population. It consists of 11 items with a Likert-type response format of 0 to 4 points and offers a total score of 0 to 44 points. The cut-off point established to classify problematic users is 16 points or more. In previous studies (Rial et al., 2015), the tool showed a sensitivity of 81% and a specificity of 82.6%. In this study, PIUS-a presented an adequate internal consistency (α = .87), higher than that reported in its original validation (α = .81).

In the third block, information was collected on sociodemographic variables, such as gender, age, current academic year and the item "Have you been diagnosed with ADHD (Attention Deficit Hyperactivity Disorder) by the health system (paediatrician, neurologist, psychiatrist or primary care doctor)?" used as a diagnostic criterion for ADHD.

The questionnaire was reviewed by a panel of experts and piloted with 40 students to ensure clarity and validity. No modifications were required for the final version.

Procedure

Data were collected in the classrooms of the centres, in small groups (between 15 and 25 individuals), to facilitate adequate supervision and ensure that each questionnaire was completed individually. Data collection was carried out during the first trimester of the 2021-2022 academic year, by a team of technicians with proven experience in carrying out this type of task. Previously, they carried out a training session to standardize the procedure to be followed as much as possible and resolve possible doubts at a technical level.

Each subject was informed of the confidentiality, anonymity, voluntariness, and purpose of the study. In addition, there was the consent and collaboration of both the management of the centres and the respective associations of mothers and fathers of students (AMPAs). The estimated time for completing the questionnaire was approximately 20 minutes. This study was approved by the Bioethics Committee of the University of Santiago de Compostela (Ref. 024/2018).

Data Analysis

A univariate and bivariate tabulation was performed. Percentages were calculated for every internet usage habits, PIU and risky practices. For the comparison of means, Student's t-tests were used, and chi-square-tests of independence were calculated for the comparison of categorical variables under study. The level of statistical significance is reported. The significance level was set at p equal-to .05, and $p < .05$, and $p < .001$ was detailed. Likewise, the Cramer V statistic was found to estimate the effect size in the comparisons of categorical variables and Cohen's d for quantitative variables.

Finally, we tried to determine if ADHD could be predictive factor of PIU. Univariate and multivariate logistic regression models with sex and age adjusted were used to estimate crude and multivariable adjusted odds ratios (ORs) with 95% confidence interval (95% CI), respectively. The Wald forward method was used, and the percentage of correctly classified cases and Nagelkerke's R-squared were reported. The analyses were performed with the IBM SPSS Statistics 25 statistical package.

Results

Internet Usage Habits

As it can be seen in Table 2, no significant differences were found in Internet use habits (daily internet use, more than three hours a day of internet use, connection after midnight, having active three or more social networks, and using the mobile phone during class) between adolescents diagnosed with ADHD and their peers without the disorder, except in the case of playing online video games (91.8% vs. 82.2%; $\chi^2 = 14.85$; $p < .001$; $V = .06$), a practice that is more frequent in the group of adolescents with ADHD. When analysing boys and girls separately, significant differences were found in terms of nighttime connection (after midnight) among female adolescents with ADHD compared to those without the diagnosis (67.9% vs. 52.2%; $\chi^2 = 7.32$; $p < .05$; $V = .06$). Likewise, in relation to the use of social networks, girls with ADHD reported having an active account on three or more social networks (71.4% vs. 60.3%; $\chi^2 = 3.75$; $p < .05$; $V = .04$) and playing online video games more frequently than their female peers without the diagnosis (81% vs. 69.2%; $\chi^2 = 4.76$; $p < .05$; $V = .05$). The differential analysis by gender shows that the differences between boys with and without a diagnosis of ADHD are not statistically significant in any of the Internet usage habits.

Table 2
Internet Use Habits in Adolescents who Report a Diagnosis of ADHD (or not)

		ADHD n (%)	No ADHD n (%)	χ^2	V
Daily Internet use	Total	217 (84.8)	3,549 (86.6)	0.56	-
	Boys	140 (81.4)	1,669 (85.5)	1.79	-
	Girls	77 (91.7)	1,880 (87.6)	0.87	-
More than 3 hours a day of Internet use	Total	114 (44.5)	1,941 (47.3)	0.65	-
	Boys	67 (39.0)	867 (44.4)	1.68	-
	Girls	47 (56.0)	1,074 (50.0)	0.91	-
Connection after 12 p.m. *(at least once a week)*	Total	137 (53.7)	2,077 (50.8)	0.73	-
	Boys	80 (46.8)	957 (49.2)	0.26	-
	Girls	57 (67.9)	1,120 (52.2)	7.32*	.06
Having active 3 or more social networks	Total	160 (62.5)	2,361 (57.5)	2.38	-
	Boys	100 (58.1)	1,066 (54.5)	0.69	-
	Girls	60 (71.4)	1,295 (60.3)	3.75*	.04
Using the mobile phone during class *(at least once a week)*	Total	98 (38.9)	1,523 (37.3)	0.26	-
	Boys	59 (35.1)	703 (36.1)	0.03	-
	Girls	39 (46.4)	820 (38.3)	1.92	-
Playing online video games *(at least once a week)*	Total	234 (91.8)	3,369 (82.2)	14.85**	.06
	Boys	166 (97.1)	1,884 (96.4)	0.05	-
	Girls	68 (81.0)	1,485 (69.2)	4.76*	.05
		M	*M*	*t*	*d*
Age of access to a smartphone of their own	Total	11.20	11.53	2.55*	0.33
	Boys	11.32	11.51	1.17	-
	Girls	11.01	11.53	2.54*	0.52

Note: *$p < .05$; **$p < .001$

On the other hand, adolescents with ADHD access their first smartphone at a significantly younger age compared to their peers without the disorder (11.20 years vs. 11.53 years; $t = 2.55$; $p < .05$; $d = 0.33$). This pattern also shows significant differences according to gender. In boys, no statistically significant differences were observed (11.32 years vs. 11.51 years; $t = 1.17$; $p = .24$), while in girls they were found (11.01 years vs. 11.53 years; $t = 2.54$; $p < .05$; $d = 0.52$).

PIU

Table 3 shows statistically significant differences in PIU between adolescents with ADHD and those without a diagnosis (25.8% vs. 18%; $\chi^2 = 9.08$; $p < .05$; $V = .05$). Although both boys and girls with ADHD show a higher PIU, the differences are more noticeable in the case of girls (34.5% vs 21%; $\chi^2 = 6.71$; $p < .05$; $V = .06$).

A logistic regression analysis predicting PIU from ADHD and demographic variables was conducted (Table 4). Being older, being

female, and having ADHD were found to be risk factors for PIU, from both univariate and multivariate perspectives. The percentage of correctly classified cases was 81.5%, and the Nagelkerke's R-squared value was .045.

Table 3
Problematic Internet Use in Adolescents who Report a Diagnosis of ADHD (or not)

		ADHD n (%)	No ADHD n (%)	χ^2	*V*
PIU	Total	66 (25.8)	740 (18.0)	9.08*	.05
	Boys	37 (21.5)	289 (14.8)	4.12*	.05
	Girls	29 (34.5)	451 (21.0)	6.71*	.06

Note: *$p < .05$; **$p < .001$

Table 4
Logistic Regression Model for Predicting PIU from ADHD Reported Diagnosis, and Demographic Variables

	Problematic Internet Use	
Variable	**Univariate OR (95% CI)**	**Multivariate OR (95% CI)**
Sex		
Boys	1	1
Girls	1.514 (1.296-1.768)	1.520 (1.297-1.780)
Age	1.231 (1.178-1.287)	1.225 (1.172-1.281)
ADHD		
No-ADHD	1	1
ADHD	1.579 (1.180-2.112)	1.671 (1.240-2.250)

Risky Practices on the Internet

As shown in Table 5, the group of adolescents diagnosed with ADHD showed higher prevalences compared to their peers without the diagnosis in all the online risk practices analysed, being significantly higher in the case of having suffered sextortion (4% vs. 1.9%; $\chi^2 = 4.14$; $p < .05$; $V = .03$), as well as in online gambling (15% vs. 8%; $\chi^2 = 12.76$; $p < .001$; $V = .06$) and pornography consumption (46.1% vs. 35.8%; $\chi^2 = 8.89$, $p < .05$; $V = .05$).

The differential analysis by gender shows that the differences between boys with and without a diagnosis of ADHD are not statistically significant, while girls with ADHD have significantly higher prevalences than girls without ADHD in relation to passive sexting at some point in their lives (31% vs. 19.8%; $\chi^2 = 5.56$; $p < .05$; $V = .05$) and pornography consumption (29.6% vs. 17.7%; $\chi^2 = 5.66$; $p < .05$; $V = .06$) in the last year.

Table 5
Risky Practices on the Internet in Adolescents who Report a Diagnosis of ADHD (or not)

		ADHD n (%)	No ADHD n (%)	χ^2	*V*
Active Sexting *(sometime in a lifetime)*	Total	37 (14.5)	464 (11.4)	2.04	-
	Boys	20 (11.7)	186 (9.6)	0.60	-
	Girls	17 (20.2)	278 (13.0)	3.08	-
Passive Sexting *(sometime in a lifetime)*	Total	61 (24)	903 (22.1)	0.52	-
	Boys	35 (20.6)	479 (24.6)	1.14	-
	Girls	26 (31.0)	424 (19.8)	5.56*	.05
Sextortion *(sometime in a lifetime)*	Total	10 (4.0)	78 (1.9)	4.14*	.03
	Boys	6 (3.6)	30 (1.5)	2.70	-
	Girls	4 (4.8)	48 (2.2)	1.33	-
Online gambling or betting *(last year)*	Total	34 (15.0)	286 (8.0)	12.76**	.06
	Boys	29 (20.0)	219 (14.9)	2.28	-
	Girls	5 (6.1)	67 (3.2)	1.32	-
Contact with strangers *(last year)*	Total	128 (51.0)	1,857 (46.2)	2.02	-
	Boys	83 (49.7)	889 (46.6)	0.46	-
	Girls	45 (53.6)	968 (45.7)	1.69	-
Pornography consumption *(last year)*	Total	101 (46.1)	1,112 (35.8)	8.89*	.05
	Boys	80 (54.1)	830 (55.0)	0.16	-
	Girls	21 (29.6)	282 (17.7)	5.66*	.06

Note. *$p < .05$; **$p < .001$

Discussion

This study aimed to compare Internet use between adolescents with and without ADHD, to contribute to a better understanding and to increase the data on this issue within the Spanish context. Although the use habits are relatively similar in both groups, the sample prevalence of PIU and that of some risky online practices are significantly higher among the group of adolescents with ADHD. In addition, significant differences are noted by gender of particular interest.

First, 5.9% of the sample reported being diagnosed with ADHD. In comparison, Isorna et al. (2021) found a prevalence of 6.65% in Galician adolescents aged 12 to 18, similar to the present study's sample. In the Spanish and global context, various studies indicate a prevalence around 5-8% in children and adolescents (Ayano et al., 2023; Canals et al., 2020; Catalá-López et al., 2012; Salari et al., 2023). Therefore, the ADHD prevalence observed in the present sample falls within the confidence intervals established by prior research. Additionally, the prevalence of ADHD shows significant differences by gender (8.1% in boys vs. 3.8% in girls). This finding aligns with previous studies, which report a prevalence in males that is two to four times higher than in females (Llanos et al., 2019; Vázquez et al., 2022).

When analysing the frequency and intensity of connection, it was found that the overall habits of Internet use is comparable between adolescents with and without ADHD. This aligns with international literature, which suggests that adolescents with ADHD engage with RICT in a manner comparable to their peers (Dawson et al., 2019). However, this contrasts with findings from the few studies conducted in Spain, which suggest a different pattern (San Mauro et al., 2021). In the present study, approximately nine out of ten adolescents reported daily internet use, with half using it for more than three hours per day. Similarly, the frequency of internet use after midnight and mobile phone use during class did not show statistically significant differences between the two groups. These findings are consistent with those observed in prevalence studies conducted in the general Spanish adolescent population (Andrade et al., 2021; Rial, 2022).

Noteworthy findings emerged when analysing digital technology usage habits from a gender perspective. On one hand, comparative analyses reveal significant differences in technology access for girls with ADHD, who obtain their first smartphone at a younger age than their female peers (with ADHD: 11.01 years vs. without

ADHD: 11.53 years) and connect significantly more after midnight (with ADHD: 67.9% vs. without ADHD: 52.2%), suggesting a higher risk of exposure. In this sense, the literature highlights the challenges faced by parents of adolescents with ADHD in managing their children's smartphone use (Chou et al., 2022). Additionally, a higher percentage of girls with ADHD report having active accounts on three or more social media platforms compared to their peers without the disorder. This result is consistent with previous research indicating that social media addiction is more prevalent among girls with ADHD (Yen et al., 2017). On the other hand, although boys with ADHD, like those in the general population, engage in video gaming more frequently (Masi et al., 2021), the present study found their prevalence of use to be comparable to that of their male peers without the disorder. This contrasts with the statistically significant differences observed in the case of girls (with ADHD: 81% vs. without ADHD: 69.2%), which has been noted in previous studies (Bolic et al., 2015). It is important to note that video games provide stimulating environments, characterized by frequent activity changes and immediate rewards—factors that reinforce the impulsive behaviour typical of adolescents with ADHD (Isorna et al., 2024). Moreover, this impulsive trait might serve as an enabler or competitive advantage for girls with ADHD in online gaming, compared to girls in the general population, who often leave such environments due to perceived hostility (López-Fernández et al., 2019). In any case, this increased video game use could be seen as an increased risk of exposure, not only in terms of greater frequency and intensity but also because ADHD is specifically associated with video game addiction (Andreassen et al., 2016), regardless of the type of game played (Mathews et al., 2019). This is particularly concerning, as some studies suggest that video game addiction has distinct effects by gender, with a significantly more negative emotional impact on girls with ADHD (André et al., 2022).

Regarding PIU, our data align with those of other studies, showing that ADHD is associated with PIU (Menéndez-García et al., 2022). In the present study, it was found that 25.8% of adolescents with ADHD were screened for PIU, a significantly higher percentage than their peers without the diagnosis. This prevalence is notably lower than those reported in previous studies. Piplani et al. (2019) found a prevalence of internet addiction of 37.78% among young people with ADHD. Lee et al. (2014) reported a PIU prevalence of 35.5% in adolescents with ADHD, like the 37.2% reported by Kaess et al. (2014). However, comparisons with other studies should be interpreted with caution due to important differences in participant age, sample type (e.g., clinical vs. community), sampling methods (probabilistic vs. non-probabilistic), and the scales or screening tools used. Furthermore, more research is needed to clarify the causal direction of this relationship. On one hand, ADHD symptoms could predispose individuals to develop PIU; on the other hand, excessive internet use could exacerbate ADHD symptoms (Wang et al., 2017).

In the present study, the prevalence of PIU was found to be significantly higher in both girls and boys with ADHD. This finding is consistent with the recent longitudinal study by Wang et al. (2024), which reveal not significant gender differences in the associations between hyperactivity, inattention, impulsivity, and PIU. These elevated prevalences in the ADHD group are particularly concerning, as the literature has identified numerous negative consequences of PIU, both in terms of physical and mental health, as well as social functioning (de la Villa & Suárez, 2016; Kokka et al., 2021; Lee et al., 2014; Panova & Lleras, 2016; Zakaria et al., 2023). However, it should be noted that PIU has been found to be a complex and multidimensional phenomenon that is difficult to predict based on just a few factors (ADHD and demographic variables). Additionally, PIU in adolescence often overlaps with other substance and behavioural addictions (Golpe et al., 2017; Liñares, 2023). In summary, the results support the notion that adolescents with ADHD may constitute a vulnerable group for the development of PIU. Given the potential adverse consequences mentioned above, it is crucial to develop selective prevention programs that address the specific vulnerability factors of this population.

Online risky practices also exhibit differences between adolescents with and without ADHD. First, the overall prevalence of sextortion exposure is more than double among adolescents with ADHD. Researchers such as Wiener (2020) highlight the heightened vulnerability of this group to peer victimization experiences, such as sextortion. This is particularly concerning, as victims of sextortion often face severe psychological consequences, including anxiety, depression, social exclusion, feelings of guilt, humiliation, low self-esteem, and an increased risk of suicide (O'Malley, 2023). Second, the percentage of adolescents with ADHD participating in online gambling is also twice as high as that of their peers. The literature emphasizes that adolescents with ADHD are particularly susceptible to gambling due to alterations in reward processing and decision-making mechanisms (Groen et al., 2013; Rubiales et al., 2017). Third, although other studies have suggested that pornography consumption and passive sexting are more prevalent among adolescents and young people with ADHD (Niazof et al., 2019; Ozdag et al., 2025), in the present study, only girls with ADHD exhibited a significantly higher prevalence of these risky practices compared to their peers, even reversing the typical gender pattern in the case of passive sexting. These findings align with research linking ADHD symptoms to risky sexual behaviours in young women (Hosain et al., 2012). A potential explanation for this pattern is the "self-medication" hypothesis, which suggests that these activities may serve as mood regulators for individuals with ADHD (Privara & Bob, 2023). These findings warrant special attention, as children and adolescents with ADHD are particularly vulnerable to addiction problems related to the excessive consumption of pornography (Villena-Moya et al., 2024). However, it should also be mentioned that in comparisons between children with and without ADHD, the effect sizes found were very small, which should temper the findings, given the complexity of the phenomenon under study.

In conclusion, gender differences between boys and girls with ADHD remain a relevant topic in the literature, and the findings of the present study contribute new evidence in this regard. Overall, girls with ADHD exhibit riskier internet use habits, a higher rate of PIU, and a greater percentage of participation in risky practices compared to their female peers without the disorder. In contrast, boys with ADHD show less pronounced differences from their male peers without the disorder (with only the differences in PIU prevalence being statistically significant). A potential explanation for this finding could be the "Gender Paradox", in which the gender with the lower prevalence of a disorder is more severely affected (Eme, 1992). Another possible explanation is that ADHD diagnoses are often delayed in girls, leading to a postponement in access to treatment, support, and interventions during critical developmental years (Almerkhlafi &

Jain, 2024). Nevertheless, as Young et al. (2020) suggest, future studies should aim to deepen our understanding of the challenges and barriers faced by girls and women with ADHD.

This study has several limitations. The cross-sectional design prevents the establishment of causal relationships between the variables under investigation. Additionally, despite using a sample of more than 4,000 adolescents, the use of non-probabilistic sampling, selecting adolescents from only Santiago de Compostela and surrounding areas, limits the external validity of the results. Furthermore, data collection in a school setting, rather than in primary care or paediatric services, meant that the variables were self-reported, which could have led to either underestimation or overestimation of reported prevalences, including the diagnosis of ADHD. However, it should be noted that for decades, several experts have established that anonymous and confidential self-reported measures have proven to be reliable and, in some cases, more effective than other methods for assessing addictive and risky behaviours (Winters et al., 1990), and that previous studies in ADHD have used this approach (Isorna et al., 2021; Niazof et al., 2019); so despite being a limitation, it does not invalidate the results obtained. In addition, considering that this is a school-based study, the verification of the ADHD diagnosis by medical records could have implications in terms of confidentiality of student data, as pointed out by the Bioethics Committee.

This study offers valuable insights into the PIU prevalence, the Internet use habits and online risky behaviours among adolescents who report a diagnosis of ADHD. The results of this study suggest that adolescents with ADHD constitute a particularly vulnerable group for developing PIU and engaging in risky online behaviours. Furthermore, notable gender differences were observed. Girls with ADHD showed increased susceptibility to risky online behaviours, including earlier access to smartphones, more frequent late-night internet use, a higher engagement in social media activities, and higher rates of passive sexting and pornography consumption. Therefore, it is crucial to implement targeted prevention and intervention strategies that address the specific needs of this population, such as routinary screening protocols for problematic internet use in ADHD clinics, family-based selective prevention programs, and gender-specific preventive programs and intervention guidelines, with a special emphasis on the Comprehensive Sexuality Education component.

Author Contributions

Manuel Isorna: Conceptualization, Investigation, Writing - Original draft. **David Liñares:** Data curation, Formal analysis, Investigation, Writing – Review & editing. **Patricia Gómez:** Formal analysis, Methodology, Visualization, Writing – Review & editing. **Víctor José Villanueva-Blasco:** Formal analysis, Validation, Writing – Review & editing. **Antonio Rial-Boubeta:** Conceptualization, Funding acquisition, Project administration, Supervision, Writing – Review & editing.

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Conflict of Interest

The authors declare that there is no conflict of interest.

Data Availability Statement

The research data associated with this article are not publicly available. Requests can be submitted to the corresponding author and may be provided on reasonable request.

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Article

Personal Recovery in Addictions: Development of a new Assessment Instrument

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ABSTRACT

Background: Identifying the key aspects of personal recovery in addictions is crucial for advancing recovery-oriented services. In Spain, no validated measures capture what service users consider most important for their recovery. This study aimed to design and validate the Personal Recovery Importance Scale (PRIS), an expanded CHIME-based instrument tailored to the addiction context. **Method:** A four-phase mixed-methods design involved experts (N = 13) and people in recovery (N = 1,604). Phase 1 focused on item development; Phases 2 and 3 assessed content and response process validity; and Phase 4 examined psychometric properties. **Results**: 42.4% of the items were revised after expert feedback and 44% following cognitive interviews. Psychometric analysis supported a seven-factor model (Connectedness, Hope, Identity, Meaning in life, Empowerment, Difficulties, and Practical support-CHIME-DP) with robust fit indices, invariance across recovery stages, satisfactory internal consistency, concurrent and discriminant validity, and hypothesis testing with key recovery variables. **Conclusions:** These findings confirm the content, face, and psychometric validity of the PRIS. This tool may be useful for prioritising and designing interventions and represents a first step towards developing PROMs and PREMs measures in Spain.

Recuperación Personal en Adicciones: Desarrollo de un Nuevo Instrumento de Evaluación

Palabras clave:
Recuperación personal
CHIME
Adicciones
Validación
Orientación hacia la recuperación

RESUMEN

Antecedentes: Identificar los aspectos clave de la recuperación personal en adicciones es esencial para avanzar en servicios orientados hacia la recuperación. En España no existen medidas validadas que recojan lo que las personas consideran prioritario en su recuperación. El objetivo fue diseñar y validar la Personal Recovery Importance Scale (PRIS), un instrumento basado en la ampliación del CHIME y adaptado a las adicciones. **Método:** Se empleó un diseño mixto en cuatro fases con la participación de expertos (N = 13) y personas en recuperación (N = 1,604). Fase 1 describió la construcción de ítems; Fases 2 y 3 evaluaron validez de contenido y proceso de respuesta; Fase 4 analizó propiedades psicométricas. **Resultados**: El 42,4% de los ítems se modificaron tras la retroalimentación experta y 44% tras entrevistas cognitivas. El análisis apoyó un modelo de siete factores (Conexión, Esperanza, Identidad, Sentido vital, Empoderamiento, Dificultades y Apoyo práctico-CHIME-DP), con buen ajuste, invarianza entre etapas, consistencia interna adecuada, validez concurrente y discriminante y pruebas de hipótesis con variables clave de recuperación. **Conclusiones**: Los hallazgos confirman la validez de la PRIS. La escala puede ser útil para priorizar intervenciones y representa un primer paso hacia el desarrollo de PROMs y PREMs en España.

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Over the past decade, the recovery-oriented care model has gained increasing prominence in the field of addictions (Bellaert et al., 2024). This approach promotes holistic, person-centred care, grounded in lived experience and oriented towards enhancing quality of life (Slade, 2010; White, 2007). Countries such as the United Kingdom, Belgium, Canada, and Australia have incorporated this paradigm into their care systems, promoting the use of Patient-Reported Outcome Measures (PROMs) and Patient-Reported Experience Measures (PREMs) to evaluate outcomes and experiences from the service user's perspective (Best et al., 2018; Zerrouk et al., 2025).

In Spain, although the approach is gaining visibility, its implementation remains limited (Sampietro et al., 2023). The new Mental Health Strategy of the National Health System (2022–2026) recognises personal recovery as one of its core principles and includes recovery-oriented community care (Ministerio de Sanidad, 2022). Nevertheless, despite these advances, there are still no validated tools to identify which aspects of the addiction recovery process are most important to individuals themselves. This gap limits the design of services that can be tailored to their needs.

The emergence of the recovery-oriented paradigm was marked by the distinction between clinical recovery and personal recovery (Davidson & White, 2007; Slade et al., 2008). Clinical recovery, rooted in professional literature, is conceived as a dichotomous state focused on symptom reduction and return to normal functioning. In contrast, personal recovery emerges from the narratives of people in recovery and is understood as a unique, heterogeneous, and non-linear process that extends beyond symptom remission. It emphasises growth, empowerment, community participation, and the pursuit of a meaningful life. This approach is underpinned by guiding principles such as placing subjective experiences at the centre, recognising individuals as active agents, safeguarding fundamental rights, and working collaboratively to improve quality of life (Vansteenkiste et al., 2024).

Since its introduction, research has devoted considerable attention to identifying the key elements of personal recovery (Kelly & Hoeppner, 2015; McDaniel et al., 2020). One of the most robust and widely recognised conceptual frameworks, demonstrating applicability in the field of addictions, is the CHIME model (Dekkers et al., 2020; Egglestone et al., 2023). Developed by Leamy et al. (2011) through a systematic review and narrative synthesis, CHIME encompasses five core processes: (1) Connectedness: including peer, family, and friendship support, social relationships and a sense of belonging to the community; (2) Hope and optimism about the future: including motivation for change, belief in the possibility of recovery, hope-inspiring relationships, constructive thinking, and goal setting; (3) Identity: including the reconstruction of a positive sense of self, its multiple dimensions, and overcoming stigma; (4) Meaning in life: including making sense of the experience of illness, rebuilding life, assuming meaningful roles, spirituality, and life purpose; (5)Empowerment: including personal responsibility, control over one's life, and a strengths-based approach. Each dimension comprises specific subthemes that operationalise the constructs.

Following its development, Leamy et al. (2011) emphasised that CHIME was not intended as a rigid model and highlighted the need for further research into its applicability in: (a) specific conditions, (b) different cultural contexts, (c) an ecological framework, and (d) different stages of the recovery process. Such research would contribute to validating and adapting the model to specific groups and contexts.

Since its inception, the CHIME model has been examined across diverse populations and contexts (Egglestone et al., 2023). Despite the extensive support for its validity, a number of recommendations have been proposed (Slade et al., 2012; Brijnath, 2015). These include the diversification of methodological designs (given that the majority of studies have employed qualitative approaches), the adaptation of the model to sociocultural contexts (with the majority of evidence being derived from Anglophone countries), and the adjustment of the model to specific populations (whereby new elements have emerged beyond the original framework). For instance, Bird et al. (2014) identified three additional areas: a) the need for practical support; b) greater attention to diagnosis and medication; and c) a degree of scepticism towards the concept of recovery. Stuart et al. (2017) proposed extending the model to incorporate difficulties (CHIME-D). Participants reported struggles, concerns, and setbacks that were not reflected in the original framework. Carson and Hurst (2021) emphasised the role of creativity (C-CHIME), while Nelson and Ogilvie (2022) added the growth component to address addiction recovery (G-CHIME).

Concurrently, certain challenges must be acknowledged. By focusing on first-person narratives, CHIME places emphasis on individual meanings, which may downplay social and structural factors. The original authors recommend framing the model within an ecological perspective (Leamy et al., 2011). Consistent with this view, several authors have stressed that personal recovery is intertwined with access to relational and material resources. They have also underscored the importance of considering social and structural determinants, such as socioeconomic factors and access to opportunities. (Bellaert et al., 2024; Klevan et al., 2023).

Several systematic reviews have analysed existing instruments to assess personal recovery (Penas et al., 2019; Thongsalab et al., 2022). Collectively, these reviews identify five priority areas for the development of new measures. First, clarifying the recovery dimensions to be measured, given the lack of conceptual clarity and consistency. Second, conducting rigorous psychometric evaluations: Penas et al. (2019) found that only 10 of the 53 reviewed instruments met basic standards. Third, involving people in recovery in the development process. Scheyett et al. (2013) note that tools incorporating service users' perspectives are the most congruent. Fourth, addressing the specific characteristics of each condition and its cultural context. In addition, three major gaps have been identified: (1) Most measures show limited alignment with the CHIME model and do not equally represent its dimensions. This is despite the model's contribution to unifying recovery processes; (2) they focus on assessing recovery markers or service-level principles without exploring in depth which aspects are considered most important by people in recovery; (3) they have largely been developed in Anglophone mental health contexts, with limited applicability to populations with addictive disorders (Ashford et al., 2019).

In Spain, two CHIME-based instruments meet the aforementioned standards: the REE (Dinniss et al., 2007; Uriarte et al., 2020) and INSPIRE (Williams et al., 2015). However, both focus on mental health, lack in-depth cultural adaptation, and do not incorporate the latest recommendations. Consequently, there is a pressing need to develop a specific tool for individuals with

addictive disorders that addresses these challenges and captures elements considered essential for recovery.

In light of the above, the present study aims to design and validate a scale to assess the most important aspects of personal recovery from addiction, based on the CHIME model and integrating the latest recommendations and challenges. The specific objectives are: (1) to describe the item generation process; (2) to examine content and response process validity through the involvement of experts and individuals in recovery; and (3) to assess the psychometric properties (factor structure, measurement invariance, internal consistency, concurrent and discriminant validity, and hypothesis testing). This novel instrument will, for the first time, validate the CHIME model in the field of addictions, highlight the priorities identified by individuals in recovery, and provide a foundation for the future development of PROMs and PREMs in Spain.

This study is part of a broader project preregistered in March 2025 on the Open Science Framework (OSF): https://osf.io/c3x82/?view_only=8e92c6ca282f4c9cb984a715b928ee40. Data, scripts, and supplementary materials are available in the folder *Study 2. Development and Validation of the Personal Recovery Importance Scale (PRIS)*. The scale was integrated into the cross-cultural adaptation of the *Life in Recovery* (LiR) survey in Spain (manuscript under review). This standardised survey was used to identify individuals in recovery and collect psychosocial information. The inclusion of the scale optimised resources and provided additional variables for validity testing.

Method

Following the recommendations of Muñiz and Fonseca-Pedrero (2019) and Boateng et al. (2018), a four-phase mixed-methods design was employed for the development and validation of the scale. This study presents the results of each phase, including item generation, content and response process validation, and psychometric evaluation (see OSF '*Development and Validation Process of the PRIS'*).

Participants

Content validity was assessed by a panel of subject-matter experts. Thirteen experts participated (53.8% male), with more than 10 years of clinical and/or research experience (M = 19.69; SD = 6.87; *Range* = 10–30) and represented different professional profiles (psychologists = 69.2%; social educators = 15.4%; social workers and physicians = 15.4%). They came from different levels of care (61.5% from third-level resources) and autonomous communities (Valencian = 53.8%; Madrid = 30.8%; Asturias = 7.7% and Andalusia = 7.7 %). Recruitment was carried out using snowball sampling, initially contacting key professionals who then recommended other potential experts.

For the pilot test, individual cognitive interviews were conducted with six people in recovery (M_{age} = 52.40; SD = 14.47; *Range* = 34–72; *male* = 66.7%). The sample was diverse in terms of recovery time and recovery pathways ($M_{time\ in\ recovery}$ = 19.67; SD = 12.34; *Range* = 4–35; professional treatment = 83.3%), primary substance (cocaine = 50%; alcohol = 16.7%; heroin = 33.3%), clinical profile (polydrug use = 50%; use of mental health services = 33.3%), and living conditions (urban = 50%; enough money to cover basic needs = 50%). Purposive sampling was used with the support of key informants. Previously recruited experts and associations recommended and facilitated access to participants.

For the psychometric evaluation of the scale, a total sample of 1,598 individuals in recovery from addictions was used (M_{age} = 46.73; SD = 11.92; 70.8% male; 39.7% single; 42.1% with primary education; 32.4% unemployed). Problematic substances reported were alcohol (50.3%) and cocaine (39.9%), followed by cannabis (10.6%) and opioids (10.1%). Percentages may exceed 100% because participants could report more than one substance. In this line, 60.8% of the sample reported multiple substance use. The mean age at onset of problematic use was 26.46 years (SD = 11.09), and the mean duration of use was 21.19 years (SD = 12.12). A total of 55.5% had experienced relapses, and 60.9% had used mental health services. Regarding recovery, the mean time was 5.5 years (SD = 8.07), classified as early (35.8%), sustained (32.4%), and stable (31.8%). The most common recovery pathways were a combination of formal and informal supports (45.2%) and exclusively formal supports (42.4%). These were followed by exclusively informal supports (6.1%) and natural recovery pathways, without structured support (2.6%). Percentages are based on valid responses, as 3.7% did not answer this item. Full distributions are available in the OSF ('*Descriptive Statistics of the Participants*').

Instruments

Personal Recovery Importance Scale (PRIS) was developed to assess the aspects that individuals in addiction recovery consider most important within their personal process. It includes seven subdimensions aligned with the adapted CHIME model: Connectedness, Hope, Identity, Meaning in Life, Empowerment, Difficulties, and Practical Support. The 25 items are rated on a 10-point Likert scale (1 = *not at all important*, 10 = *extremely important*). Although five- to seven-point formats are often recommended (Lozano et al., 2008), prior studies have shown that well-defined items can remain reliable with up to ten categories (Leung, 2011). Participants in the cognitive interviews found the 10-point scale intuitive and better suited to express subjective importance, consistent with rating practices in Spanish clinical and recovery contexts (De-Sola et al., 2017).

Life in Recovery Survey (LIR; Laudet, 2013). This survey was developed by the US organisation Faces and Voices of Recovery (FAVOR) to collect information on recovery journeys, pathways, and experiences. In the present study, we used the Spanish-adapted version (currently under editorial review). The following sections were employed:

a. Strengths and Barriers Recovery Scale (SABRS) (Best et al., 2020). This scale assesses strengths and barriers experienced before and after the onset of recovery across five key domains (health, legal status, finances, employment, and social relationships). Responses are recorded in a dichotomous format (*yes/no*). Items are grouped into four categories: (1) Recovery strengths in active addiction; (2) Recovery barriers in active addiction; (3) Recovery strengths in recovery; and (4) Recovery barriers in recovery. These categories allow calculation of the perceived change in strength growth and recovery deficits. The Spanish adaptation adjusted the items to the sociocultural context. The original 32-item scale (15 strengths and 17 barriers)

was reduced to 24 items (11 strengths and 13 barriers) while maintaining equivalence. In the present study, the scale showed adequate reliability (α = .785; ω = .786; α = .777; ω = .777; α = .786; ω = .785; α = .628; ω = .616).

b. Time in Recovery. A culturally adapted open-ended question was used: When do you consider you first began your process of change or recovery that led you to where you are now?". Based on participants' responses, they were classified into three recovery stages (Betty Ford Institute Consensus Panel, 2007): early (less than 1 year), sustained (1–5 years), and stable (more than 5 years).

Flourishing Scale (Diener et al., 2010; Checa et al., 2018). This scale measures psychological well-being from a eudaimonic perspective, focusing on personal growth, life purpose, and positive relationships. It consists of eight items rated on a Likert scale from 1 (*strongly disagree*) to 7 (*strongly agree*). It yields a global score of positive functioning. The scale has been validated in the Spanish context, showing good psychometric properties. In the present study, it showed good reliability (α = .877; ω = .881).

Procedure

Stage 1. Item Generation. The objective was to develop an initial set of items derived from a clearly defined construct. First, the research team conducted an in-depth analysis of the CHIME model, adapting it to the field of addictions and incorporating the main challenges and recommendations. A preliminary set of items was then drafted, ensuring a minimum of two items per subdimension. Subsequently, a review committee was established to evaluate the items through iterative rounds. In each round, the committee assessed clarity, representativeness, and redundancy. Finally, those items considered most significant and representative for each subdimension were selected.

Stage 2. Content Validity. A structured expert judgement process was conducted. First, a fillable PDF version of the scale was prepared and sent to each expert (see OSF '*Guidelines for the Expert Panel'*). Each expert independently rated the clarity and relevance of the items on a scale from 1 (not clear/relevant) to 4 (very clear/relevant) and provided qualitative comments. The responses were then analysed and summarised in a comparative table, which served as the basis for decision-making.

Stage 3. Cognitive Interview-Based Pilot Study. Cognitive interviewing is one of the most recommended techniques for conducting pilot testing (Boateng et al., 2018). Individual, in-person, voluntary, and anonymous interviews were conducted with people in recovery. Each session lasted an average of 60 minutes, was guided by a team member with clinical experience, and was recorded for subsequent transcription and analysis. A structured protocol was used, incorporating "think-aloud" and "verbal probing" techniques (see OSF *'Cognitive Interview Script'*). Participants read the items aloud and verbalised their reasoning. The interviewer then asked targeted questions to explore comprehension, interpretation, clarity of instructions, and suitability of the response format. The responses were subsequently analysed and compiled into a comparative table to inform decision-making. Items were presented grouped by dimension to enhance comprehension and reduce cognitive load among participants with heterogeneous educational and clinical backgrounds. Although this format may increase context-related covariance, it was considered appropriate for ensuring accessibility and response clarity.

Stage 4. Psychometric Evaluation. The instrument was tested by assessing its structure through exploratory and confirmatory factor analyses, measurement invariance, internal consistency, concurrent and discriminant validity, and hypothesis testing. A multi-strategy approach was planned and implemented to recruit a heterogeneous sample of people in recovery (Subbaraman et al., 2015). First, dissemination materials were designed (posters, leaflets, messages for social media). A database of addiction services in Spain was then compiled. Dissemination took place through four channels: (a) contact with experts and organisations using convenience sampling, (b) promotion via social media, (c) dissemination at specialised conferences, (d) telephone contact with addiction services to request participation and disseminations. Various synonyms for "in recovery" were used to capture the diversity of experiences, as recommended by Vitellone et al. (2022). Inclusion criteria were: (1) currently undergoing or having undergone a process of change or recovery from a substance use problem; or currently attempting or having succeeded in overcoming a substance addiction problem, (2) aged 18 years or older, (3) residing in Spain. Recruitment took place between September 2024 and March 2025. The survey was administered both digitally (via the LimeSurvey platform) and on paper, adapting to the circumstances of each service. Voluntary participation and anonymity were ensured, and informed consent was obtained.

The study was conducted following the Declaration of Helsinki and approved by the ethical committee of the University of Valencia (3332693). Before participating, all individuals received full information about the study objectives and gave their informed consent.

Data Analysis

Content validity was examined using the Item-level Content Validity Index (I-CVI; Lynn, 1986). Qualitative feedback was organized into comparative tables to refine item wording. Cognitive interview data were analysed using framework analysis (Bryman & Burgess, 1994), with emphasis on response comprehension. Analyses were conducted using Microsoft Excel and Word (version 2506, build 18925.20158).

Prior to psychometric testing, data were screened for missing responses (< 5% per item) and no systematic patterns were detected. Missing data were handled through Full Information Maximum Likelihood (FIML) in Mplus 8 (Enders, 2022). A classical item analysis was then conducted to assess item performance. Means, standard deviations, response distributions and corrected item-total correlations were examined following standard criteria (DeVellis & Thorpe, 2022). Items with correlations above .30 and without floor or ceiling effects (> 15%; Terwee et al., 2007) were retained.

Structural validity was assessed using a sequential factor-analytic approach. Parallel Analysis and the Hull Method were first conducted in JASP 0.18 to determine the optimal factor number (Lorenzo-Seva et al., 2011). The sample was randomly divided into two subsamples. An Exploratory Factor Analysis (EFA) was performed on the first subsample (n = 668) using Mplus 8 (Muthén & Muthén, 1998–2017), with a polychoric correlation matrix and the WLSMV estimator, robust to non-normality (Holgado-Tello et al., 2010). Factor retention was guided by statistical criteria and

theoretical interpretability within CHIME (Lloret-Segura et al., 2014). A Confirmatory Factor Analysis (CFA) was subsequently conducted in the second subsample to test model stability, with fit assessed using χ^2, CFI, RMSEA, and SRMR (Kline, 2023). Acceptable fit thresholds were considered as CFI > .90 and RMSEA/SRMR < .08 and < .05.

Measurement invariance across recovery stages was examined through configural, metric, and scalar multigroup models. Internal consistency was evaluated using Cronbach's α (Cronbach, 1951), McDonald's ω (McDonald, 1999), and the Composite Reliability Index (CRI; Hair et al., 2010), and their 95% confidence intervals. Coefficients ≥ .70 were considered acceptable for research purposes (Kline, 2015).

Concurrent validity was examined through correlations between PRIS scores and Strengths Growth, Recovery Deficits, Recovery Time, and the Flourishing Scale., Positive correlations were expected with recovery time, strengths, and flourishing, and negative correlations with deficits (Kaskutas et al., 2014; Parker et al., 2018). Discriminant validity was assessed using the Heterotrait–Monotrait ratio (HTMT; Hair et al., 2021), calculated via Henseler's online tool (https://www.henseler.com/htmt.html). Values < .90 indicated adequate discriminant validity.

Finally, hypothesis testing was performed using Spearman's correlations between PRIS dimensions, age, and abstinence time, and Mann–Whitney *U* tests to compare genders. Based on previous research, we expected women to score slightly higher in Connectedness, Hope, and Empowerment (McQuaid & Dell, 2018; Abreu Minero et al., 2022), minimal age effects (Slade et al., 2012; Kelly et al., 2018), and positive associations with abstinence time (Keith et al., 2022; Knapp et al., 2024).

Results

Stage 1. Item Generation

The research team expanded and adapted the CHIME model to the context of addictions. Two new dimensions were added: one addressing difficulties (maintaining abstinence, accepting the problem, and managing symptoms) and another covering key structural aspects (meeting basic needs and accessing social resources and opportunities). Several subthemes from the original model were also adjusted: in Connectedness, relationships with individuals who do not use drugs and mutual support were included; in Identity, self-reconstruction was added; and in Empowerment, personal rights and values were incorporated. The resulting model was named CHIME-DP and comprised seven dimensions: Connectedness, Hope, Identity, Meaning in life, Empowerment, Difficulties, and Practical Support. An initial pool of 124 items was then generated and reviewed over eight rounds. During this process, 86 items were eliminated, 6 were merged, 37 were revised, and 1 was reclassified. The final set was reduced to 33 items. OSF '*Results of the Iterative Round-Based Process'* provides the actions taken in each review round.

Stage 2. Content Validity

Content validity was assessed by calculating the Item-Level Content Validity Index (I-CVI), complemented by qualitative evaluations. Full scores, actions, and reason for change are detailed in the OSF '*Results of the Expert Review'*. A total of 84.85% of items exceeded the .80 threshold for clarity, and 81.82% did so for relevance. Specifically: (a) 11 items were retained (I-CVI > .85); (b) 10 items were revised to improve linguistic and conceptual clarity; (c) 3 items were reformulated to better capture the intended subdimension; (d) 1 item was reclassified due to misalignment with the expected dimension; and (e) 8 items were eliminated due to low scores (I-CVI < .78) and lack of specificity. After these modifications, the final scale consisted of 25 items.

Stage 3. Cognitive Interview-Based Pilot Study

The results of the cognitive interviews and the actions taken are detailed in the OSF '*Results of the Cognitive Interviews'*. Of the 25 items analysed: (a) 14 items were retained, confirming their comprehension and interpretation; (b) 8 items were revised to improve conceptual precision and linguistic clarity, including the replacement of terms with more everyday language; and (c) 3 items were adjusted to clarify their content. In addition, the instructions were simplified, and it was ensured that responses referred specifically to the recovery process. Finally, agreement was reached with participants on using a 1-to-10 response scale, due to its clarity and familiarity. OSF *'Results of the Item Transformation'* provides the entire item transformation process.

Stage 4. Psychometric Evaluation

Preliminary Analyses

Before testing the factorial structure, descriptive statistics, reliability estimates, and classical item analyses were conducted to assess item quality and discrimination of items. As shown in OSF, '*Classical Item Analysis Results and Plot Distributions'* item means ranged from 7.78 to 9.36 (*SD* = 1.37-2.59), distributions were unimodal with negative skew, and all corrected item-total correlations exceeded .30 (*range* = .36-.71) supporting adequate variability and homogeneity (DeVellis & Thorpe, 2022). No floor effects were observed (≤ 0.4% across all factors). Ceiling effects ranged from 26.7% to 50.2% at the subscale level, reflecting high endorsement of positive recovery experiences, but remained below 15% for the total PRIS score (14.1%).

Structural Validity

Parallel Analysis was conducted to determine the optimal number of factors to retain as a complementary procedure to the Exploratory Factor Analysis (EFA). Results showed that the seven-factor configuration provided the best balance between empirical adequacy and theoretical interpretability. Real-data factor eigenvalues exceeded the simulated FA eigenvalues for the first seven factors, supporting a 7-factor solution (See OSF '*Results of the Parallel Analysis*'). Sampling adequacy was excellent (KMO = .949; Bartlett's χ^2 (206) = 1606.93, p <. 001). Promax rotation was applied to allow factor correlations. Although some items displayed secondary loadings in conceptually related dimensions (e.g., items 7, 9, 14, and 19), this pattern was theoretically consistent with the interrelated nature of CHIME components (Vogel et al., 2020). Item allocation was therefore guided by theoretical coherence and content validity rather than exclusively by statistical criteria. Standardised

factor loadings from the rotated solution are available in the OSF '*Fit of the 1 to 8 Factor Models and Standardized Saturations in the EFA'*. A Confirmatory Factor Analysis (CFA) was subsequently conducted based on the established factor structure. The model demonstrated good fit (χ^2 (254) = 659.931, p < .01, CFI = .915, RMSEA = .046 [90% CI .042–.050], SRMR = .039). Standardised loadings are shown in Table 1, and factors correlations in Table 2.

Table 1
Standardized Loadings on the Confirmatory Factor Analysis (CFA)

Item	F1	F2	F3	F4	F5	F6	F7
I1	.612						
I2	.555						
I3	.729						
I4		.575					
I5		.648					
I6		.592					
I7		.622					
I8			.725				
I9			.720				
I10			.686				
I11				.685			
I12				.671			
I13				.642			
I14				.752			
I15					.545		
I16					.718		
I17					.837		
I18					.694		
I19						.728	
I20						.878	
I21						.839	
I22						.820	
I23							.706
I24							.566
I25							.719

Note. I= Item; F1= Difficulties, F2= Connectedness, F3= Hope, F4=Identity, F5=Meaning in life, F6=Empowerment, F7=Practical Support.

Table 2
Bivariate Correlations

	F1	F2	F3	F4	F5	F6	F7
F1 Difficulties	1	.689	.572	.597	.625	.533	.515
F2 Connectedness		1	.880	.878	.783	.758	.754
F3 Hope			1	.861	.819	.754	.757
F4 Identity				1	.880	.887	.820
F5 Meaning in life					1	.845	.801
F6 Empowerment						1	.752
F7 Practical Support							1

Note. F1= Difficulties, F2= Connectedness, F3= Hope, F4=Identity, F5=Meaning in life, F6=Empowerment, F7=Practical Support.

Invariance Based on Stage of Recovery

In order to assess for invariance, configural, metric, and scalar invariance were tested across the three recovery stages. The initial configural invariance model showed a good but not fully acceptable fit (χ^2 (834) = 1779.610, p < .001, CFI = .890, TLI = .882, RMSEA = .050, SRMR = .070). Consequently, the model and modification indices were carefully examined and a meaningful correlation among the items 5 and 9 was discovered. As this correlation was theoretically meaningful and justified, a correlation between the residuals of these items was added to the model. The revised model demonstrated a meaningful improvement in fit, with notable increases in CFI and TLI and a reduction in RMSEA (χ^2 (831) = 1538.816, p < .001, RMSEA = .043 [90% CI .040–.047], CFI = .916, TLI = .909, SRMR = .068). Therefore, configural invariance was established. The metric invariance model constrained factor loading to be equal across stages, while allowing intercepts, residuals, and factors means (in non-reference groups) to vary. This model also showed an acceptable fit (χ^2 (853) = 1580.234, p < .001, RMSEA = .043 [90% CI .039–.046], CFI = .913, TLI = .908, SRMR = .072). Changes in fit indices compared to the configural model were minimal (ΔCFI = −.003, ΔRMSEA = 0.000), supporting equivalence in item–factor relationships across groups. The scalar invariance model, constraining both factor loadings and item intercepts to equality across the three groups, showed an acceptable fit (χ^2 (845) = 1576.400, RMSEA = .044 [90% CI .040–.047], CFI = .914, TLI = .908, SRMR = .078). Fit indices were virtually unchanged (ΔCFI ≈ 0, ΔRMSEA ≈ 0), supporting scalar invariance and allowing for meaningful latent mean comparisons. The residual correlation between item 5 and 9 remained statistically meaningful, consistent with stable item-specific shared variance across groups. Standardised loadings for all three groups are shown in Table 3.

Table 3
Standardized Loadings of the Latent Variables for the Scalar Invariance Model

Factors and items	λ (Stage 1)	λ (Stage 2)	λ (Stage 3)
F1 Difficulties	-	-	-
I1	.548	.664	.656
I2	.551	.578	.612
I3	.685	.812	.778
F2 Connectedness	-	-	-
I4	.555	.568	.574
I5	.648	.549	.655
I6	.661	.610	.681
I7	.596	.632	.700
F3 Hope	-	-	-
I8	.700	.783	.697
I9	.612	.657	.722
I10	.661	.760	.715
F4 Identity	-	-	-
I11	.611	.716	.707
I12	.655	.669	.695
I13	.599	.684	.666
I14	.719	.762	.781
F5 Meaning in life	-	-	-
I15	.560	.580	.545
I16	.674	.753	.726
I17	.778	.815	.800
I18	.682	.698	.670
F6 Empowerment	-	-	-
I19	.704	.743	.714
I20	.843	.868	.844
I21	.762	.794	.787
I22	.733	.814	.785
F7 Practical Support	-	-	-
I23	.693	.757	.765
I24	.664	.646	.547
I25	.724	.759	.759

Note. Stage 1 = early recovery (less than 1 year), Stage 2 = sustained recovery (1–5 years), Stage 3 = stable recovery (more than 5 years).

Internal Consistency

Three complementary reliability indices were calculated: Cronbach's alpha, McDonald's omega, and the Composite Reliability Index (CRI) (See Table 4). Results indicated good internal consistency, particularly for factors F3 to F6, which showed high values across all indicators. Factor F1 showed the lowest values (α = .687; ω = .691; CRI = .669), close to the lower limit of acceptability. Additionally, the standardized factor loadings for F1 items, although significant, were moderate (ranging from .555 to .729). This results in a lower proportion of explained variance. Nevertheless, the reliability of F1 can be considered acceptable for research purposes.

Discriminant Validity

Discriminant validity was assessed using Pearson bivariate correlations among factors and the Heterotrait–Monotrait (HTMT) ratio of correlations. Pearson correlations ranged from .515 to .887, indicating moderate to strong relationship among factors (see Table 2). HTMT values ranged from .59 to .90, no confidence internal included 1, indicating that all constructs roughly meet the recommended .90 criterion for conceptually related constructs, and most also meet the more conservative .85 threshold. (See OSF '*HTMT Results'*).

Concurrent Validity

Concurrent validity was examined by correlating the PRIS scale with growth in strengths, recovery deficits, recovery time, and flourishing (See Table 5). All factors showed small to moderate positive associations with growth in strengths and flourishing, and negative associations with recovery deficits. Recovery time was positively associated with Difficulties (F1) and Connectedness (F2), and negatively with Practical Support (F7).

Hypothesis Testing

Bivariate correlations indicated small positive associations between age and Difficulties, Connectedness, Identity, and Empowerment, with no significant associations for Hope, Meaning, or Practical Support (ρ = .125 to .025). Abstinence time showed a similar pattern, with small positive associations for all dimensions except Hope and Practical Support (ρ = .197 to -.027). Regarding gender, women scored significantly higher across all seven PRIS dimensions (See OSF '*Hypothesis Testing Results'*)

Discussion

This study presents the design and validation of a new measure to assess the most important aspects of personal recovery in the context of addiction, based on the revised CHIME model. All phases of the process are detailed with the participation of experts and people in recovery. One of the key aspects was the need to precisely define the construct to be evaluated. The literature highlights that this step is often underdeveloped, leading to a lack of clarity and conceptual confusion (Bowen et al., 2022; Thongsalab et al., 2022). In this study, the CHIME model provided the theoretical framework for operationalising the construct, offering clearly differentiated subdimensions. Its use, however, went beyond uncritical reproduction: major challenges were incorporated (Bellaert et al., 2024), key gaps were addressed (Penas et al., 2019), and adaptations were made to the specific features of addiction (Dekkers et al., 2020, 2021). This adaptation allows progress not only in measurement, but also in the conceptualisation of personal recovery.

On the other hand, the multiple changes made during the process confirm the importance of a structured approach that integrates qualitative techniques and the active participation of experts and people in recovery to ensure adequate content and face validity (Bowen et al., 2023). Contributions from experts

Table 4
Internal Consistency Indices for Each Factor

Item	α	95% CI α	ω	95% CI ω	CRI	95% CI CRI
F1 Difficulties	.687	[0.633, 0.741]	.691	[0.663, 0.719]	.669	[0.593, 0.739]
F2 Connectedness	.712	[0.677, 0.748]	.717	[0.695, 0.743]	.703	[0.658, 0.750]
F3 Hope	.733	[0.687, 0.780]	.736	[0.712, 0.760]	.754	[0.704, 0.801]
F4 Identity	.772	[0.741, 0.803]	.780	[0.763, 0.801]	.782	[0.747, 0.817]
F5 Meaning in life	.760	[0.723, 0.797]	.763	[0.742, 0.783]	.796	[0.760, 0.828]
F6 Empowerment	.859	[0.834, 0.883]	.861	[0.851, 0.875]	.890	[0.829, 0.872]
F7 Practical Support	.752	[0.715, 0.787]	.756	[0.734, 0.777]	.704	[0.652, 0.751]

Note. F= Factor; α = Cronbach's alpha; ω = McDonald's omega; CRI= Composite Reliability Index.

Table 5
Correlations Between the PRIS Scale and Key Recovery Variables

	Growth In Strengths	Recovery Deficits	Recovery Time	FS-Flourishing Scale
F1 Difficulties	.119**	-.040	.073**	.207**
F2 Connectedness	.175**	-.048	.081**	.337**
F3 Hope	.122**	-.027	-.040	.361**
F4 Identity	.133**	-.058*	.033	.256**
F5 Meaning in life	.147**	-.064*	.023	.284**
F6 Empowerment	.136**	-.041	.022	.311**
F7 Practical Support	.097**	-.041	-.061*	.204**

Note. ** = $p <$ .01; * = $p <$ .05

helped refine the technical content (42.4% of the items were revised), while those from service users were essential to adapt the scale to their context and real-life experience (44% of the items revised). Altogether, these findings highlight the value of this participatory approach in ensuring ecological validity.

Regarding the psychometric evaluation, preliminary analysis indicated good item functioning. Some factors that showed slight ceiling effects. This pattern is consistent with previous studies using instruments grounded in the CHIME framework, which explicitly assess the importance attributed to recovery components. Skar-Fröding et al. (2021) reported that most service users rated these components as highly important (66%–91%), supporting the expectation of negatively skewed distributions toward higher scores in recovery-oriented measures.

Regarding factor structure, analyses confirmed a seven-factor structure that offers the best balance between statistical fit and theoretical interpretation. This structure is supported by a solid theoretical framework and a participatory process, thus addressing several of the limitations noted in the literature (Penas et al., 2019; Thongsalab et al., 2022). The standardised loadings indicated good alignment of the items with their factors, with most above .60 or .70 (Kline, 2023). However, some items fell within the acceptable range, warranting potential revision in future research. Correlations among subscales were consistent with the CHIME model (Shanks et al., 2013), showing stronger relationships among the five original dimensions and comparatively lower relationships with the two extended dimensions. These results reflect the structure of CHIME, in which specific sub-processes remain conceptually interconnected, increasing statistical interdependence (Williams et al., 2015). It also suggests that the extended dimensions represent broader contextual elements that are somewhat more distal from the individual perspective.

Regarding invariance, the results showed that the instrument maintains the same conceptual configuration, unit of measurement, and equivalence across different stages of recovery. This finding confirms that the theoretical structure of the CHIME model is consistent and applicable at various points in the recovery process. In addition, metric and scalar invariance will allow for rigorous comparisons of factors and items across groups. This is essential for identifying specific needs and optimising the design of interventions (Leamy et al., 2011). Finally, items 5 and 9 were found to share common variance, which may indicate some conceptual overlap. It would be advisable to examine this aspect to adjust or better differentiate these items, as they are theoretically distinct.

Regarding internal consistency, α, ω, and CRI coefficients met recommended standards for research use (≥ .70; Nunnally & Bernstein, 1994), although further evidence in independent samples would help confirm their robustness for applied or clinical decision-making. The only factor with slightly lower values was Difficulties (F1), placing it at the acceptable threshold. This lower consistency was expected, as it is a dimension composed of only three items and encompasses heterogeneous subcomponents, which may affect internal cohesion (Schmitt, 1996). Nonetheless, future research could explore its expansion or refinement.

The concurrent correlations were small in magnitude but theoretically coherent, consistent with the subjective and experiential nature of personal recovery (Leamy et al., 2011) and align with prior work reporting modest associations between value-based recovery indicators and behavioural outcomes (Williams et al., 2015; Van Weeghel et al., 2019). Positive associations with strengths, reduced barriers, and flourishing suggest consolidation of core recovery processes. Regarding subdimensions, Difficulties (F1) showed a positive association with recovery despite being expected to decrease. This may reflect that the dimension encompasses deeper processes (problem acceptance, maintenance of abstinence, and overcoming relapses) (Kaskutas et al., 2014) and that stage-based temporal categories may not capture the non-linear nature of recovery. Practical support decreased with time in recovery, supporting the hypothesis of recovery as a dynamic process that transitions from urgent needs towards deeper transformations (Dekkers et al., 2021). Future studies should examine recovery profiles beyond time-based classifications.

Regarding discriminant validity, some inter-factor correlations were high (≥ .80), a pattern that is theoretically coherent with the CHIME model (Leamy et al., 2011), in which the core dimensions are mutually reinforcing. Psychometric studies of CHIME-based instruments frequently report substantial inter-factor correlations, reflecting the systemic and holistic nature of personal recovery (Shanks et al., 2013; Penas et al., 2020).

In the hypothesis testing, small associations were observed with age, gender, and abstinence duration, as expected. Regarding gender, women scored higher across all PRIS dimensions, consistent with the influence of gendered stigma, caregiving responsibilities, and trauma exposure on recovery trajectories (McQuaid & Dell, 2018; Abreu Minero et al., 2022), suggesting effects beyond relational, hope, and empowerment processes. Age showed weak and heterogeneous associations, in line with previous studies (Slade et al., 2012; Kelly et al., 2018), likely mediated by relational and contextual factors. Abstinence time showed associations with most factors, except Hope and Practical Support, possibly reflecting the consolidation of identity- and meaning-related processes and reduced instrumental needs in later recovery stages.

This study presents some limitations that should be considered. First, although the 10-point response format was supported by participant feedback, such formats may inflate reliability estimates. Therefore, reliability results should be interpreted cautiously, and future studies should compare shorter formats using Item Response Theory. Second, internal consistency coefficients were based on a single administration and do not capture temporal stability, underscoring the need for longitudinal designs to examine test–retest reliability and sensitivity to change. Third, grouping items by dimension may have introduced context-related covariance and contributed to overestimated internal reliability, warranting alternative configurations in future work. Lastly, further refinement is recommended in the less robust dimensions, including expansion of item content and longitudinal examination of factorial stability and Minimal Detectable Change to better assess clinically meaningful variation in recovery.

Despite these limitations, this study represents a significant contribution to the field of recovery in addictions. First, the PRIS is the first tool developed and validated in the Spanish context to assess the key aspects of personal recovery in addictions. Second, the CHIME model is expanded by incorporating structural and

difficulties dimensions, addressing some of the main theoretical and empirical challenges highlighted in the literature. Finally, this work constitutes an initial step toward implementing recovery-oriented approaches within the new Mental Health Strategy of the National Health System (2022–2026) in Spain.

This study presents the first tool to assess the most important aspects of personal recovery in addiction, supported by a solid theoretical foundation, content and face validity, psychometric validity, and invariance across recovery stages. It also integrates a critical analysis of the CHIME model, incorporating relational, structural, and difficulties-related aspects to address recovery from an ecosystemic framework. Altogether, this makes it particularly useful for identifying the priorities of people in recovery according to their trajectories and living conditions. It also supports the incorporation of the lived experience perspective into service planning. Furthermore, it represents a first step towards developing PROM and PREM measures in the field of addictions and implementing the recovery-oriented model in Spain.

Author Contributions

Lucas Serrano-Pastor: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Visualization, Writing - Original draft. **Sylvia Georgieva:** Data curation, Formal analysis, Methodology, Software, Visualization, Writing - Original draft, Writing – Review & editing. **Alfredo Zarco-Alpuente:** Conceptualization, Data curation, Investigation, Methodology, Visualization, Writing – Review & editing. **Paula Samper-García:** Conceptualization, Investigation, Methodology, Project administration, Supervision, Writing – Review & editing. **Guillermo Blanco-Bailac:** Conceptualization, Investigation, Resources, Visualization. **Teresa Bobes-Bascaran:** Conceptualization, Investigation, Resources, Visualization. **Pedro Gómez-Linares:** Conceptualization, Investigation, Resources, Visualization. **José Miguel Martínez-González:** Conceptualization, Investigation, Resources, Visualization. **José Antonio Molina-Peral:** Conceptualization, Investigation, Resources, Visualization. **Francisco Pascual-Pastor:** Conceptualization, Investigation, Resources, Visualization. **José-Antonio Giménez-Costa:** Conceptualization, Investigation, Methodology, Project administration, Supervision, Writing – Review & editing.

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Conflict of Interest

The authors declare that there are no conflicts of interest.

Data Availability Statement

This study is part of a broader project preregistered in March 2025 on the Open Science Framework (OSF): https://osf.io/c3x82/?view_only=8e92c6ca282f4c9cb984a715b928ee40. Data, Scripts, supplementary materials and other resources are available in the folder *Study 2. Development and Validation of the Personal Recovery Importance Scale (PRIS)* on the same OSF page. The dataset can be requested from the corresponding author for research purposes and will be released after the remaining planned publications are completed.

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