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DISEÑO, IMPLEMENTACIÓN Y EVALUACIÓN DE INTERVENCIONES TECNOLÓGICAS PARA REDUCIR EL ESTIGMA EN ESTUDIANTES UNIVERSITARIOS HACIA LAS PERSONAS CON TRASTORNO MENTAL GRAVE

DESIGN, IMPLEMENTATION AND EVALUATION OF TECHNOLOGY-BASED INTERVENTIONS TO REDUCE STIGMA AMONG UNIVERSITY STUDENTS TOWARDS PEOPLE WITH SEVERE MENTAL ILLNESS.

Tesis doctoral

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"Unfortunately, stigma's impact on a person's life may be as harmful as the direct effects of the disease".

Patrick W. Corrigan

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Consideraciones previas

CONSIDERACIONES PREVIAS

1. La presente tesis doctoral fue realizada a través de compendio de 3 publicaciones en revistas indexadas de alto impacto en categoría Q1 y Q2 en el ranking de Journal Citation Report (JCR), de acuerdo a la Normativa de Estudios Oficiales de Doctorado de la Universidad de Almería.

2. En la totalidad de los artículos presentados el doctorando es el autor principal y correspondiente.

3. Si bien la presente tesis se ha redactado en español, se han incluido los artículos científicos publicados en su versión original (inglés), además de un resumen en español previo al inicio de cada uno de estos.

4. En cuanto a las citas y referencias, en la introducción y justificación temática se siguió la normativa APA 7ma edición. Respecto a los artículos presentados, estos siguieron la normativa específica solicitada por cada una de las revistas.

Abreviaturas

ABREVIATURAS

- AQ-E: Attribution Questionnaire, Spanish version
- AQ-ER: Attribution Questionnaire, Emotional Response factors
- CG: control Group
- E-Contact: Electronic contact
- EG: experimental group
- HSS: High-school student
- MIS-9: 9-item Mental Illness Stereotypes
- PDD: Perceived Devaluation and Discrimination Scale
- PRISMA: Preferred Reporting Items for Systematic Reviews and Meta-analyses
- PROSPERO: Prospective Register of Systematic Reviews
- PSA-21: 21-item Public Stigma and Acceptance Scale
- QSAS: Questionnaire on Student Attitudes toward Schizophrenia
- ROB: Risk of bias
- VR: Virtual Reality
- SDS-6: 6-item Social Distance Scale
- SMI: Severe Mental Illness
- SMD: Severe Mental Disorder
- SPS-6: 6-item Social Proximity to persons with schizophrenia Scale
- SS-8: 8-item Stigmatization Scale
- UGS: Undergraduate student

Tesis por compendio de publicaciones

TESIS POR COMPENDIO DE PUBLICACIONES

La presente tesis doctoral se presenta como un compendio de 3 publicaciones científicas, de acuerdo a la Normativa de Estudios Oficiales de Doctorado de la Universidad de Almería, Aprobado en Consejo de Gobierno de 29 de octubre de 2020. Específicamente, esta normativa señala:

1. Se permitirá presentar la tesis por la modalidad de compendio de publicaciones cuando se presente un mínimo de 3 contribuciones que cumplan las siguientes condiciones mínimas:

a) Que dos contribuciones se incluyan en la categoría A de la escala de valoración de los resultados de investigación contenida en el Plan Propio de Investigación y Transferencia de la Universidad de Almería aprobado en el correspondiente año.

b) Que una tercera contribución, distinta de las anteriores y que no consista en comunicación a Congreso, se incluya en la categoría B de la escala de valoración de los resultados de investigación contenida en el Plan Propio de Investigación y Transferencia de la Universidad de Almería aprobado en el correspondiente año. Las contribuciones deberán haber sido publicadas o aceptadas para su publicación como máximo un año antes de la primera matriculación en el correspondiente programa de doctorado.

2. La tesis por compendio de publicaciones deberá contener como mínimo:

a) Una introducción que describa la unidad temática y estructura del trabajo, indicando las publicaciones que abordan cada elemento de la misma.

b) Las publicaciones aportadas.

c) Conclusiones generales, indicando de qué publicación se desprenden.

d) Otras aportaciones científicas derivadas directamente de la tesis doctoral.

Al respecto, la totalidad de los artículos que integran la presente tesis doctoral por compendio de publicaciones se encuentran publicados a fecha del depósito de tesis y cumplen con la normativa señalada precedentemente. Además, estos artículos han seguido un proceso de revisión por pares y se han publicado en los dos primeros cuartiles de revistas indexadas en el Journal Citation Report (JCR).

El detalle e indicadores bibliométricos de cada uno de los artículos presentados se encuentran a continuación:

I. Artículo 1: Controlled Study of the Impact of a Virtual Program to Reduce Stigma Among University Students Toward People With Mental Disorders

Referencia: **Rodríguez-Rivas, M. E.**, Cangas, A. & Fuentes, D. (2021). Controlled Study of the Impact of a Virtual Program to Reduce Stigma Among University Students Toward People With Mental Disorders. *Frontiers in Psychiatry, 12*, 632252. https://doi.org/10.3389/fpsyt.2021.632252

- Revista: Frontiers in Psychiatry
- Situación: Publicado
- Factor de impacto: 5.435
- Área: Health Care Sciences & Services
- Factor JIF: Q2 (38/143)
- Recibido: 22 de noviembre de 2020
- Aceptado: 20 enero de 2021
- Publicado: 9 de febrero de 2021
- Número de revisores externos: 3
- Autor de correspondencia: Matías E. Rodríguez-Rivas

II. Artículo 2: Innovative Technology–Based Interventions to Reduce Stigma Toward People With Mental Illness: Systematic Review and Meta-analysis.

Referencia: **Rodríguez-Rivas, M. E**, Cangas, A., Cariola, L. A., Varela, J., & Valdebenito, S. (2022). Innovative Technology–Based Interventions to Reduce Stigma Toward People With Mental Illness: Systematic Review and Meta-analysis. *JMIR Serious Games*, *10*(2), e35099. https://doi.org/10.2196/35099

- Revista: JMIR Serious Games
- Situación: Publicado
- Factor de impacto: 4.143
- Área: Health Care Sciences & Services
- Factor JIF: Q1 (25/107)
- Recibido: 24 de noviembre de 2021
- Aceptado: 14 abril de 2022
- Publicado: 30 de mayo de 2022
- Número de revisores externos: 3
- Autor de correspondencia: Matías E. Rodríguez-Rivas

III. Artículo 3: Reducing stigma toward people with severe mental illness through a virtual reality intervention: a randomized controlled trial

Referencia: Rodríguez-Rivas, M. E., Cangas, A., Martin, A., Romo, J., Pérez, C., Valdebenito, S., Cariola, L., Onetto, J., Hernández, B., Ceric, F., Cea, P., & Corrigan, P. (2023). Reducing stigma toward people with severe mental illness through a virtual reality intervention: a randomized controlled trial. *Games for Health Journal*. https://doi.org/10.1089/g4h.2023.0118

- Revista: Games for Health Journal
- Situación: Aceptado
- Factor de impacto: 4.07
- Área: Rehabilitation
- Factor JIF: Q1 (3/173)
- Recibido: 1 de marzo de 2023

Resumen/abstract

RESUMEN

El estigma en salud mental, es un grave problema a nivel mundial, con diversas consecuencias, afectando la autoestima, la calidad de vida, la adherencia al tratamiento y el acceso a oportunidades educativas y laborales de las personas con problemas de salud mental. Este estigma no solo afecta a quienes padecen trastornos mentales, sino que también se extiende a sus familias y profesionales de la salud.

Además, los profesionales de la salud y estudiantes universitarios muestran estigmatización hacia las personas con trastornos mentales, lo que repercute directamente en la calidad de la atención brindada.

El modelo teórico de estigma público en salud mental adoptado en la presente tesis es el modelo cognitivo social, que explica cómo los pensamientos, emociones y comportamientos contribuyen al estigma, incluyendo los procesos asociados a los estereotipos, prejuicios y discriminación.

A nivel de intervenciones, destaca la falta de programas específicos en Chile para reducir el estigma hacia la población con trastornos psiquiátricos, a pesar de los lineamientos del Plan Nacional de Salud Mental. A nivel internacional, se señala la efectividad de programas implementados desde la década de los 70, pero poseen necesidad de innovación e intervención, especialmente en edades tempranas de la formación profesional.

Al respecto diversas intervenciones se han realizado, pero se han enfocado principalmente en intervenciones de contacto y educación, con falta de componentes tecnológicos innovadores, los cuales se han visto prometedores para generar cambio social y cognitivo.

En particular, el uso de intervenciones tecnológicas ha emergido como una herramienta prometedora. Se ha observado que las intervenciones basadas en tecnología, como videojuegos educativos y realidad virtual, son adaptables a diferentes contextos y rangos de edad, siendo especialmente efectivas entre estudiantes universitarios. Estas tecnologías han demostrado reducir la sintomatología ansiosa y depresiva, así como combatir ideas erróneas y estigmatización relacionadas con trastornos mentales graves.

Específicamente, la estrategia de "e-contact" ha ganado relevancia, siendo definida como interacciones mediadas por ordenador en tiempo real entre miembros de diferentes grupos y usuarios de servicios de salud mental. A través de chat y videoconferencia, se ha comprobado que el e-contact reduce la ansiedad, estigma y estereotipos hacia personas con trastornos mentales, fomentando actitudes inclusivas. Este enfoque también promueve el desarrollo de habilidades, la reflexión y la empatía entre los estudiantes.

La realidad virtual aplicada a la salud mental utiliza entornos virtuales para ofrecer intervenciones terapéuticas. Esta tecnología inmersiva ha demostrado impacto en áreas cognitivas y emocionales, generando cambios actitudinales y conductuales. Estudios recientes, muestran resultados significativos en la reducción del estigma mediante la simulación de experiencias cotidianas en primera persona.

Un ejemplo concreto de diseño de programa a nivel internacional, es el programa Inclúyete-VR, diseñado en España para reducir el estigma hacia personas con trastorno mental grave. Este programa de realidad virtual ofrece una experiencia inmersiva que simula las alucinaciones en la esquizofrenia, seguido de un "centro de crisis" y etapas interactivas que promueven la inclusión social.

Como vacío de conocimiento a nivel nacional e internacional, se evidencia la necesidad de más investigación experimental y sistematización de intervenciones tecnológicas en la reducción del estigma en salud mental. En Chile, la ausencia de

programas enfocados en intervenciones tecnológicas resalta la importancia de implementar acciones y diseñar evaluaciones para reducir la estigmatización desde las etapas formativas de los estudiantes y mitigar sus consecuencias en la población afectada.

Frente a ello el objetivo general de la presente tesis doctoral fue diseñar, implementar y evaluar el efecto de intervenciones con el uso de intervenciones tecnológicas en la reducción del estigma en estudiantes universitarios hacia las personas con trastorno mental grave.

Como resultados se realizaron 3 estudios, los que fueron publicados en 3 artículos de revistas de alto impacto. El resumen de cada uno de ellos se señala a continuación:

1. En el primer estudio, se investigó a través de un estudio aleatorizado controlado, el impacto de un programa online multicomponente diseñado para reducir el estigma hacia la enfermedad mental, con el fin de responder al primer objetivo específico de la presente tesis doctoral.

   En el estudio, el grupo de intervención participó en un programa online que combinaba aprendizaje basado en proyectos, simulaciones clínicas con pacientes estandarizados y e-Contacto con pacientes reales. Mientras tanto, el grupo de control participó en un programa educativo no relacionada la salud mental.

   La evaluación del programa se llevó a cabo utilizando cuestionarios de estigma validados en español, de forma previa y posterior a las intervenciones.

   Los resultados mostraron que, tras la intervención, los participantes del grupo de intervención mostraron significativamente niveles más bajos de estereotipos, percepción de peligrosidad y puntuación global hacia las personas con esquizofrenia. También se observaron reducciones en peligrosidad-miedo, evitación, coerción, falta de solidaridad y puntuación

global. En contraste, el grupo de control no mostró cambios significativos en el estigma. Además, la valoración global de los componentes del programa por parte del grupo de intervención fue positiva.

Se concluye, que el programa multicomponente online demostró ser eficaz en la reducción del estigma hacia la enfermedad mental entre los estudiantes universitarios.

2. En el segundo estudio, se llevó a cabo una revisión sistemática y un metaanálisis con el objetivo de alcanzar el objetivo específico 2 de la presente tesis doctoral. Los métodos utilizados se basaron en las directrices PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-analyses), abarcando estudios en inglés y español publicados entre 2016 y 2021. La búsqueda se realizó en cinco bases de datos diferentes, y solo se consideraron ensayos controlados aleatorizados. Dos revisores independientes evaluaron la elegibilidad, extrajeron datos y calificaron la calidad metodológica de los estudios. Los metaanálisis se llevaron a cabo mediante el programa informático Comprehensive Meta-Analysis.

Después de examinar 1158 artículos, se evaluaron 72 a texto completo, de los cuales 9 fueron incluidos en las síntesis cualitativas y cuantitativas. Se identificaron diversas intervenciones, como videojuegos, simulación audiovisual de alucinaciones, realidad virtual y contacto electrónico con usuarios de servicios de salud mental. El metaanálisis, que incluyó a 1832 participantes, demostró que estas intervenciones tenían un efecto medio consistente en la reducción del nivel de estigma público (d = -0.64; IC 95% 0.31-0.96; $p < .001$).

La revisión destaca que las intervenciones innovadoras que incorporan tecnologías son efectivas en la reducción del estigma. Se plantean, además, nuevos desafíos para demostrar su adaptabilidad a diferentes contextos y países, con el objetivo de promover su implementación a gran escala.

3. El tercer estudio que buscó responder al objetivo específico 3. Específicamente, la investigación se llevó a cabo a través de un ensayo

controlado aleatorizado con el objetivo de medir el impacto de este programa en el nivel de estigma hacia personas con trastorno mental grave.

Concretamente, los participantes del grupo experimental fueron expuestos al software de realidad virtual *Inclúyete-VR*, el que incorpora alucinaciones comunes en la esquizofrenia y luego se presentan diversos recursos psicosociales para la recuperación e inclusión social. El grupo de control utilizó software de realidad virtual no relacionado con la salud mental. Las sesiones de realidad virtual se llevaron a cabo mediante las gafas de Oculus ® y tuvieron una duración de 25 minutos.

Los resultados del estudio, que incluyó a 124 estudiantes universitarios distribuidos aleatoriamente en grupos de intervención y control, mostraron una reducción significativa en los niveles generales de estigma, así como en las subescalas de peligrosidad-miedo, evitación e insolidaridad en el grupo experimental después de la intervención ($p < 0,001$ para todas las categorías). El análisis de varianza mixto reveló una interacción significativa entre la intervención y el tiempo.

Se concluye, que el programa Inclúyete-VR demostró ser eficaz a corto plazo en la reducción del estigma hacia personas con enfermedades mentales graves. El estudio sugiere la necesidad de investigar la eficacia a largo plazo, así como la escalabilidad y difusión del programa para comprender completamente su impacto y aplicabilidad en diferentes contextos.

A partir de los resultados de las tres investigaciones que sustentan la presente tesis doctoral se concluye que las intervenciones innovadoras basadas en tecnología son herramientas eficaces para reducir el estigma hacia las personas con problemas de salud mental. Se destaca el carácter pionero de la investigación, ya que incluyó el primer estudio experimental publicado de una intervención multicomponente completamente en línea. Además, se realizó el primer meta-análisis centrado específicamente en intervenciones tecnológicas para reducir el

estigma en salud mental, marcando un avance significativo no solo a nivel nacional en Chile, sino también a nivel internacional.

Como desafíos y líneas de investigación futura, se plantea ampliar los tamaños muestrales y la participación internacional para realizar comparaciones transculturales. Además, se requiere incorporar medidas más variadas de estigma, tanto a través de informes directos como de observaciones a lo largo del tiempo para evaluar la sostenibilidad de las intervenciones tecnológicas.

Se plantea, además, la necesidad de adoptar enfoques más complejos en la medición, considerando variables mediadoras y moderadoras. La personalización de intervenciones es crucial, entendiendo cómo distintos grupos responden a las tecnologías para optimizar su efectividad. Finalmente, se enfatiza la importancia de explorar mediciones implícitas, que ayude a controlar la deseabilidad social, para obtener una comprensión más completa y precisa del estigma en salud mental.

Palabras Clave: Estigma; Trastorno Mental Grave; Nuevas tecnologías; Realidad Virtual; e-contact.

ABSTRACT

Stigma in mental health is a serious problem worldwide, with several consequences, affecting self-esteem, quality of life, adherence to treatment and access to educational and employment opportunities for people with mental health problems. This stigma not only affects those with mental disorders, but also extends to their families and healthcare professionals.

In addition, healthcare professionals and university students show stigmatization towards people with mental disorders, which has a direct impact on the quality of care provided.

The theoretical model of public stigma in mental health adopted in this thesis is the social cognitive model, which explains how thoughts, emotions and behaviors contribute to stigma, including processes associated with stereotypes, prejudice and discrimination.

At the intervention level, the lack of specific programs in Chile to reduce stigma towards the population with psychiatric disorders stands out, despite the guidelines of the National Mental Health Plan. At the international level, the effectiveness of programs implemented since the 1970s is noted, but there is a need for innovation and intervention, especially at early ages of professional training.

In this regard, several interventions have been carried out, but they have focused mainly on contact and educational interventions, with a lack of innovative technological components, which have shown promise in generating social and cognitive change.

In particular, the use of technological interventions has emerged as a promising tool. Technology-based interventions, such as educational video games and virtual reality, have been found to be adaptable to different contexts and age ranges, being especially effective among college students. These technologies have been

shown to reduce anxious and depressive symptomatology, as well as combat misconceptions and stigmatization related to serious mental disorders.

Specifically, the "e-contact" strategy has gained relevance, being defined as real-time computer-mediated interactions between members of different groups and users of mental health services. Through chat and videoconferencing, e-contact has been proven to reduce anxiety, stigma and stereotypes towards people with mental disorders, fostering inclusive attitudes. This approach also promotes skill development, reflection and empathy among students.

Virtual reality applied to mental health uses virtual environments to deliver therapeutic interventions. This immersive technology has demonstrated impact in cognitive and emotional areas, generating attitudinal and behavioral changes. Recent studies show significant results in reducing stigma by simulating first-person, everyday experiences.

A concrete example of program design at an international level is the *Inclúyete-VR* program, designed in Spain to reduce stigma towards people with severe mental disorders. This virtual reality program offers an immersive experience that simulates hallucinations in schizophrenia, followed by a "crisis center" and interactive stages that promote social inclusion.

As a knowledge gap at national and international level, the need for more experimental research and systematization of technological interventions in the reduction of stigma in mental health is evident. In Chile, the absence of programs focused on technological interventions highlights the importance of implementing actions and designing evaluations to reduce stigmatization from the formative stages of students and mitigate its consequences in the affected population.

In view of this, the general objective of this doctoral thesis was to design, implement and evaluate the effect of interventions with the use of technological

interventions in the reduction of stigma in university students towards people with severe mental disorders.

As results, 3 studies were conducted and published in 3 high impact journal articles. The summary of each of them is shown below:

1. In the first study, the impact of a multicomponent online program designed to reduce stigma towards mental illness was investigated through a randomized controlled trial, in order to respond to the first specific objective of the present doctoral thesis.

   In the study, the intervention group participated in an online program combining project-based learning, clinical simulations with standardized patients and e-Contact with real patients. Meanwhile, the control group participated in an educational program unrelated to mental health.

   Program evaluation was conducted using validated stigma questionnaires in Spanish, pre- and post-intervention.

   The results showed that, after the intervention, participants in the intervention group showed significantly lower levels of stereotypes, perceived dangerousness and global scores towards people with schizophrenia. Reductions in dangerousness-fear, avoidance, coercion, lack of solidarity, and global score were also observed. In contrast, the control group showed no significant changes in stigma. In addition, the overall rating of the program components by the intervention group was positive.

   It is concluded, that the online multicomponent program proved to be effective in reducing stigma towards mental illness among university students.

2. In the second study, a systematic review and meta-analysis was carried out with the aim of achieving specific objective 2 of this doctoral thesis. The methods used were based on the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-analyses) guidelines, covering studies in

English and Spanish published between 2016 and 2021. The search was performed in five different databases, and only randomized controlled trials were considered. Two independent reviewers assessed eligibility, extracted data, and rated the methodological quality of the studies. Meta-analyses were performed using the Comprehensive Meta-Analysis software.

After reviewing 1158 articles, 72 full-text articles were evaluated, of which 9 were included in the qualitative and quantitative syntheses. Various interventions were identified, such as video games, audiovisual simulation of hallucinations, virtual reality and electronic contact with mental health service users. The meta-analysis, which included 1832 participants, showed that these interventions had a consistent mean effect on reducing the level of public stigma (d=-0.64; 95% CI 0.31-0.96; p < .001).

The review highlights that innovative interventions incorporating technologies are effective in reducing stigma. New challenges are also posed to demonstrate their adaptability to different contexts and countries, with the aim of promoting their large-scale implementation.

3. The third study sought to respond to specific objective 3.

   Specifically, the research was conducted through a randomized controlled trial with the objective of measuring the impact of this program on the level of stigma towards people with severe mental disorder.

   Concretely, participants in the experimental group were exposed to the virtual reality software Include Yourself-VR, which incorporates hallucinations common in schizophrenia and then presented with various psychosocial resources for recovery and social inclusion. The control group used virtual reality software unrelated to mental health. The virtual reality sessions were conducted using Oculus ® goggles and lasted 25 minutes.

   The results of the study, which included 124 college students randomly distributed into intervention and control groups, showed a significant reduction in overall levels of stigma, as well as in the subscales of

dangerousness-fear, avoidance, and lack of solidarity in the experimental group after the intervention ($p < 0.001$ for all categories). Mixed analysis of variance revealed a significant interaction between intervention and time.

It is concluded, that the Include Yourself-VR program proved to be effective in the short term in reducing stigma towards people with severe mental illness. The study suggests the need to investigate the long-term effectiveness, as well as the scalability and dissemination of the program to fully understand its impact and applicability in different contexts.

Based on the results of the three research studies that underpin this dissertation, it is concluded that innovative technology-based interventions are effective tools for reducing stigma towards people with mental health problems. The pioneering nature of the research is highlighted, as it included the first published experimental study of a fully online multicomponent intervention. In addition, the first meta-analysis focused specifically on technological interventions to reduce stigma in mental health was conducted, marking a significant advance not only at the national level in Chile, but also at the international level.

As challenges and lines of future research, it is proposed to expand sample sizes and international participation to make cross-cultural comparisons. In addition, it is necessary to incorporate more varied measures of stigma, both through direct reports and observations over time to evaluate the sustainability of technological interventions.

There is also a need to adopt more complex approaches to measurement, considering mediating and moderating variables. Personalization of interventions is crucial, understanding how different groups respond to technologies to optimize their effectiveness. Finally, the importance of exploring implicit measurements, which help to control for social desirability, is emphasized in order to obtain a more complete and accurate understanding of mental health stigma.

Keywords: Stigma; Severe Mental Disorder; New technologies; Virtual Reality.

Introducción

INTRODUCCIÓN

Problemas de salud mental y trastorno mental grave

De acuerdo a la Organización Mundial de la Salud [OMS], se entiende la salud mental como un estado de bienestar en el cual los individuos son conscientes de sus propias capacidades, pudiendo afrontar las tensiones normales de la vida y trabajar de forma productiva y fructífera, generando a su vez una contribución a la comunidad en la que se encuentran inmersos (OMS, 2013).

Por otra parte, los problemas de salud mental abarcan una amplia variedad de trastornos, cada uno de ellos con características distintas y que en líneas generales se manifiestan como alteraciones en los procesos del razonamiento, el comportamiento, la facultad de reconocer la realidad, las emociones o las relaciones con los demás, que son consideradas como anormales con respecto al grupo social de referencia del cual proviene el individuo (Errázuriz et al., 2015).

Las enfermedades psiquiátricas afectan a más de 1 billón de personas a nivel mundial, siendo responsables de un 7% de toda la carga mundial de morbilidad y el 19% de todos los años vividos con discapacidad, cifras que han ido en aumento en las últimas décadas, debido en parte a la estigmatización y a la falta de acceso al tratamiento (Rehm & Shield, 2019).

Específicamente, dentro de estas patologías, **los trastornos mentales graves** [Serious Mental Ilnesses en inglés] representan el mayor impacto en las personas afectadas y en la salud pública en términos de carga de enfermedad, costos económicos y consecuencias negativas en la calidad de vida (Bahorik et al., 2017; Gónzalez et al., 2022). Estos trastornos, se refieren a un grupo de trastornos psiquiátricos que se caracterizan por síntomas graves y discapacitantes que afectan significativamente el pensamiento, las emociones, el comportamiento y la capacidad de funcionar en la vida cotidiana, incluyendo comúnmente a los trastornos psicóticos, trastorno bipolar y depresión mayor con síntomas psicóticos

o depresión resistente al tratamiento, pudiendo también puede incluir trastornos de ansiedad, trastornos de la alimentación y trastornos de la personalidad, si el grado de deterioro funcional es grave (Gónzalez et al., 2022).

Dentro de las consecuencias asociadas a la presencia de trastorno mental grave, se ha descrito que quienes las padecen poseen una menor calidad y esperanza de vida, además de un aumento de problemas de salud física y de las tasas de mortalidad prematura, ya que aumentan entre 40 y 60% la probabilidad de sufrir una muerte prematura secundarios a problemas de salud relacionados, como el cáncer, enfermedades cardiovasculares, infecciosas y de manera frecuente el suicidio (Silva et al., 2013; Zedan el al., 2023).

De esta forma, la evidencia muestra que los problemas de salud no solo poseen diversas consecuencias en quienes las padecen derivadas de propia enfermedad, sino que además se asocian a altas cifras de discriminación, estigmatización y actitudes negativas de la población y profesionales de la salud, representando un estresor que reduce la calidad de vida y posibilidad de búsqueda de ayuda en los pacientes afectados por dichas patologías (Knak et al., 2017; Kohl et al., 2023).

En paralelo, la evidencia internacional deja en evidencia que un 76,6 % de las personas con presencia de un trastorno mental afirma que se les ha atribuido frecuentemente alguna característica negativa por el hecho de padecer estas patologías, y más de un 80% manifiesta haber sido tratadas injustamente en algún ámbito de su vida (Balasch et al., 2016). Lo anterior se encuentra asociado a conductas, prejuicios y actitudes negativas que representa el estigma por parte de la población general y profesionales de diversas disciplinas, lo que impacta negativamente en la calidad de vida, la posibilidad de la obtención de empleo y desarrollo profesional de los pacientes con alguna enfermedad del espectro de salud mental (Knak et al., 2017; Vicente et al., 2016).

Estigma en salud mental: Conceptos y modelos asociados

El concepto de estigma más consolidado históricamente, fue descrito inicialmente por Erving Goffman (1963) en su obra: *Stigma: Notes on the Management of Spoiled Identity*. En ella, se define y conceptualiza al estigma como un atributo profundamente desacreditador que reduce a alguien estigmatizado, de una persona completa y habitual, a una persona deteriorada, menospreciada y percibidos como si tuvieran una "identidad estropeada" (Goffman, 1963).

Específicamente, cuando el estigma se encuentra asociado a la salud mental se entiende como una serie de procesos sociales, psicológicos y psicosociales que afecta a la persona estigmatizada, provocando su exclusión y marginación del grupo normativo (González et al., 2008). Junto con ello, la forma en la que se percibe el mundo, las creencias, opiniones y actitudes son determinadas en buena medida por los patrones del grupo social de la población y los procesos de socialización, en el que se establecen relaciones que promueven o inhiben la formación de valores, percepciones y concepciones particulares, las que se conforman a partir de valores negativos que conducen a la estigmatización, discriminación y establecimiento de actitudes negativas hacia ciertas personas o grupo social, dentro de las que se encuentran las que padecen alguna patología mental (Ellemers et al., 2002).

Específicamente, en relación con el estigma en salud mental se han planteado diversos modelos, definiciones y constructos teóricos, los que han sido analizados y reestructurados de forma iterativa a partir de la evidencia empírica en este campo (Sheehan et al., 2022).

El primer concepto clave posee relación directa con el desarrollo teórico de Goffmann (1963), el cual aborda específicamente el *estigma público* en salud mental. Este estigma es entendido como un conjunto de actitudes, creencias y conductas negativas hacia las personas con problemas de salud mental por parte

de la población, las que conllevan, entre otros, al temor, rechazo, evitación y discriminación hacia las personas afectadas (Corrigan & Watson, 2002; Corrigan & Shapiro, 2010).

Estudios en el campo de la psicología social y experimental, han mostrado que los procesos de estigmatización en salud mental se asocian a procesos cognitivos inconscientes y automáticos, lo que se ha denominado *estigma implícito* (Brener et al. 2013). Dada su naturaleza, el estigma implícito requiere técnicas de medición diferentes a las medidas explícitas de autoinforme (Stier & Hinshaw, 2007), por lo que comúnmente se realiza su medición a través la Prueba de Asociación Implícita (IAT) (Greenwald et al., 1998).

La evidencia demuestra que comúnmente las personas afectadas por un problema de salud mental son conscientes e internalizan el estigma público hacia ellos, lo que se ha denominado y conceptualizado como *autoestigma* (Corrigan & Rao, 2012; Corrigan & Watson, 2002). El estigma internalizado puede dañar la autoestima y generar sentimientos de vergüenza y desprecio por uno mismo, y ha demostrado ser un potente predictor negativo del proceso de recuperación en salud mental y de calidad de vida en las personas afectadas (Rüsch et al. 2014; Drapalski et al. 2013).

A nivel social al considerar al contexto familiar y red cercana a las personas afectadas por la estigmatización, es necesario destacar el concepto de *estigma por asociación* (Koschade & Lynd-Stevenson, 2011). Este estigma se refiere a la experiencia de discriminación, estereotipos o prejuicios que enfrentan los amigos, familiares, proveedores de servicios de salud, empleadores u otras personas, por el hecho de estar relacionadas con las personas con problemas de salud mental (Pryor et al., 2012; Van der Sanden et al., 2013). Esto se ve reflejado especialmente hacia las familias y profesionales de la salud que trabajan en el área de salud mental, donde la evidencia muestra que son percibidos como

personas menos calificadas, lógicas, dinámicas y respetadas que las de otras especialidades (Halter, 2008).

A continuación, la Tabla 1 resume los principales conceptos asociados al estigma en salud mental.

Tabla 1. Conceptos claves del estigma en salud mental

Concepto	Definición	Ejemplo
Estigma Público	Actitudes, creencias y conductas negativas hacia personas con problemas de salud mental por parte de la población, lo que conlleva temor, rechazo, evitación y discriminación.	Algunas personas evitan sentarse junto a alguien que parece tener un trastorno mental en el transporte público, debido al temor o estigma
Estigma Implícito	Procesos de estigmatización en salud mental relacionados con procesos cognitivos inconscientes y automáticos.	A través de la Prueba de Asociación Implícita (IAT), se revela que incluso las personas que no se consideran prejuiciosas pueden mostrar altos niveles de estigma implícito hacia las personas con problemas de salud mental.
Autoestigma	Conciencia, acuerdo e internalización del estigma público por parte de las personas afectadas, lo que daña la autoestima y genera sentimientos de vergüenza y desprecio hacia uno mismo.	Una persona con un trastorno mental se avergüenza y posee una baja autoestima debido a la estigmatización y discriminación internalizada.
Estigma por Asociación	Discriminación, estereotipos o prejuicios experimentados por amigos, familiares, proveedores de servicios de salud y otros, debido a su relación con personas con problemas de salud mental.	Los familiares de individuos con problemas de salud mental pueden ser excluidos de reuniones sociales por temor o los prejuicios relacionados.

Nota: Elaboración propia a partir de la búsqueda de literatura

Es importante destacar que el eje central de la presente tesis doctoral versa sobre el **estigma público** en salud mental, cuyo modelo teórico se describe a continuación.

Modelo teórico de estigma público en salud mental: El modelo cognitivo social.

Si bien a nivel internacional se han planteado diversos modelos teóricos de estigma específicamente para el desarrollo de la presente tesis doctoral se encuentra enmarcado dentro del modelo cognitivo social [social-cognitive model en inglés], el que ha sido ampliamente utilizado y validado a nivel empírico por diversas investigaciones del área (Catalano et al., 2021; Muñoz et al., 2021; Sheehan et al., 2022; Werner, 2015).

Este modelo busca explicar cómo los pensamientos, las emociones y las conductas se relacionan con la perpetración del estigma público hacia las personas con problemas de salud mental, el cual se desarrolla a través de un proceso cognitivo-conductual, en el que las cogniciones conducen a emociones y comportamientos (Michaels et al., 2017). De esta forma, el estigma público es entendido como un fenómeno complejo compuesto por tres constructos psicológicos sociales: estereotipos, prejuicios y discriminación (Catalano et al., 2021; Sheehan et al., 2022), los que se describen con mayor profundidad en la Figura 1 y a continuación:

- Los *estereotipos* son comprendidos como las ideas generalizadas y negativas sobre las personas con problemas de salud mental, las que comúnmente se encuentran asociados a la incompetencia, la debilidad y la peligrosidad (Por ejemplo, los estereotipos asociados a que las personas con esquizofrenia son muy violentas e impredecibles).

- Por su parte los *prejuicios* se entienden como la reacción emocional resultante de estar de acuerdo con el estereotipo, por lo que comúnmente se asocian a sentimientos de miedo y enojo (Por ejemplo, sentir miedo hacia las personas con esquizofrenia, debido a que se presentan estereotipos asociados a la peligrosidad de esta población).

- La *discriminación* por su parte es entendida como el comportamiento derivado de los estereotipos y prejuicios (Por ejemplo, debido a que se piensa que las personas con esquizofrenia son peligrosas e impredecibles y genera emociones negativas, las personas comúnmente evitan el compartir y/o relacionarse con ellas).

Figura 1. Modelo cognitivo social del estigma público en salud mental

Ej: "Las personas con esquizofrenia son peligrosas e impredecibles".

Estereotipos (Cognición)

Prejuicios (Emociones)

Ej: Sentir miedo hacia las personas con esquizofrenia debido a que son peligrosas e impredecibles.

Discriminación (Conducta)

Ej: Evitar el compartir y/o relacionarse con las personas con esquizofrenia.
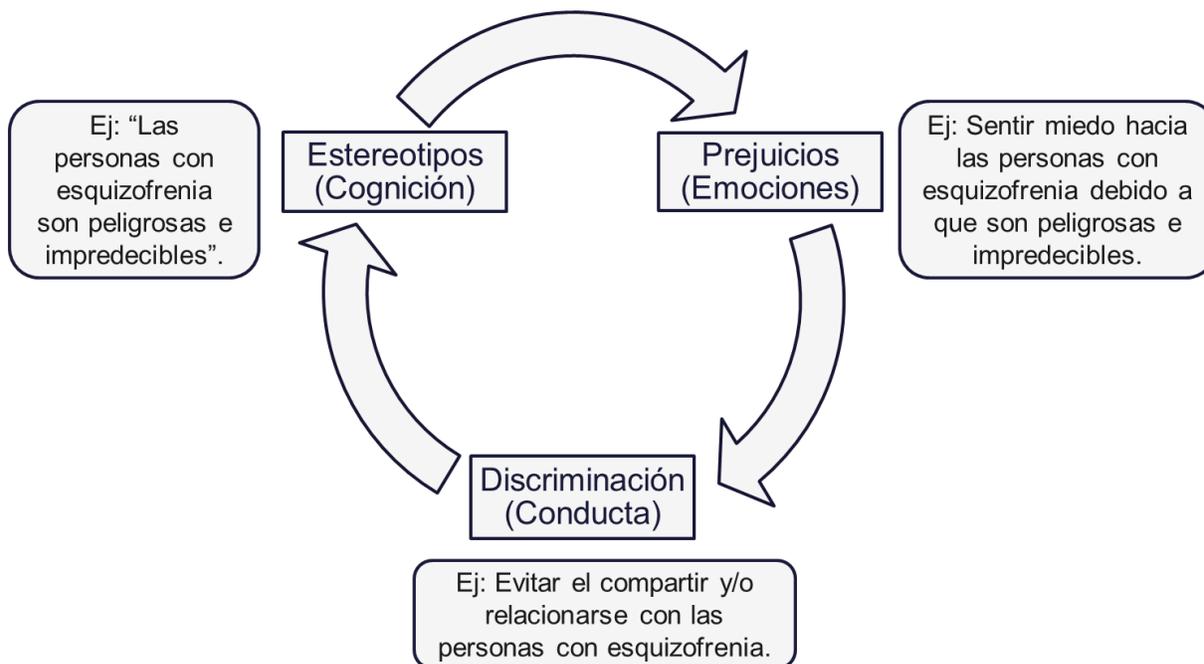
Nota: Elaboración propia

Consecuencias del estigma público hacia las personas con problemas de salud mental y trastorno mental grave

La evidencia muestra que las personas con trastornos mentales son una de las poblaciones más vulnerables, ya que con frecuencia se encuentran el estigma de la población general y de los profesionales de la salud, restringiendo sus derechos y generando desigualdades en el acceso, el tratamiento y los resultados en salud (da Silva et al., 2020; Link et al., 2001; Poreddi et al., 2017).

Como consecuencia de estos prejuicios, actos discriminatorios y estereotipos negativos hacia las personas con patologías de salud mental, es frecuente que estas presenten un bajo nivel de autoestima y una menor calidad de vida, además de una baja adherencia a los tratamientos, una reducción significativa de sus redes sociales y un menor acceso a espacios laborales y educacionales (Brouwers, 2020; Krupa et al., 2009).

Por consiguiente, se transforma en un fenómeno contraproducente para lograr la plena inclusión social, además de interferir en la búsqueda y el mantenimiento de empleo, incapacidad para continuar o finalizar los estudios, lograr metas técnicas o profesionales, tener una vivienda adecuada, junto con carencia de apoyo social, bajo nivel de autoestima y aumento del riesgo suicida (Hampson et al., 2020; Yang et al., 2013).

De esta forma el estigma representa un grave problema de salud pública en todo el mundo y se considera la principal barrera para el acceso y adherencia a tratamiento y el proceso de recuperación de las personas afectadas (Knaak et al., 2015; Kane et al., 2019). Lo anterior tiene gran relevancia en el contexto global, donde las investigaciones han demostrado la presencia de altos niveles de discriminación, estigma y prejuicio hacia las personas impactadas por problemas de salud mental, especialmente hacia el trastorno mental grave [Serious Mental

Illness SMI en inglés], como la esquizofrenia y trastorno bipolar (Rodríguez-Rivas, 2021; Parcesepe & Cabassa, 2013).

Los efectos agravados del estigma suponen una importante barrera para que las personas con trastorno mental grave logren una plena inclusión social e interfieren en su bienestar y calidad de vida, contribuyendo a aumentar la mortalidad, morbilidad y el riesgo de suicidio (Stefanovics et al., 2016; Yuan et al., 2017).

Así, la discriminación, los prejuicios y los estereotipos presentes en la sociedad no sólo impactan severamente en el proceso de recuperación, la calidad de vida y el bienestar de las personas con enfermedades mentales y sus familias, sino que también representan la principal brecha en el acceso a los servicios especializados de salud mental por parte de la población general, lo que conlleva un retraso en el diagnóstico y una menor adherencia al tratamiento especializado (Corrigan & Wassel, 2008; Link et al., 2001; Thornicroft, 2008).

Este estigma negativo se ha observado incluso en profesionales y estudiantes universitarios en formación, lo que repercute directamente y es el principal determinante en la calidad de los cuidados y atención otorgada a los pacientes afectados por estas patologías (Al Omari et al., 2022; Pompeo-Fargnoli, 2022).

Se ha observado que los profesionales de la salud mental y los estudiantes de medicina estigmatizan a los pacientes psiquiátricos (Navarro & Triguero, 2019), y el 40% de las personas con un trastorno mental afirman recibir un trato injusto por parte de profesionales sanitarios como médicos, psiquiatras, psicólogos y enfermeras (Arens et al., 2009; Funk et al., 2012). Experimentar el estigma en entornos médicos es un factor estresante que contribuye, entre otras cosas, a reducir la calidad de vida de los pacientes y a exacerbar las desigualdades en los resultados sanitarios y el acceso a la asistencia sanitaria (Jadhav et al., 2007; Poreddi et al., 2017). Además, el estigma se considera un obstáculo importante contra los procesos de recuperación de la salud mental y es un determinante

principal de la calidad de la atención prestada por los profesionales sanitarios y los estudiantes del área de la salud (Vidourek & Burgage, 2019; Yin et al., 2020).

La evidencia y altas cifras de discriminación demuestran que la generación de intervenciones en disminución del estigma resulta vital e imprescindible, especialmente cuando son realizadas a edades tempranas, por lo que generar intervenciones disminuyan la estigmatización en estudiantes representa un desafío y aplicación de gran impacto en el bienestar de la población y la formación profesional (Corrigan, 2016; Thornicroft et al., 2018).

Intervenciones realizadas a nivel nacional e internacional en reducción del estigma en salud mental: Desde la comprobada efectividad a la necesidad de innovación

A nivel nacional, en Chile se han propuesto y desarrollado políticas públicas en prevención y promoción de la salud mental comunitaria a nivel nacional, principalmente a través de los lineamientos que establece el Plan Nacional de Salud Mental 2017-2025 (Ministerio de Salud, 2017). En este, precisamente se reconoce la importancia del desarrollo de intervenciones comunitarias que promuevan una disminución del estigma hacia las personas con enfermedades psiquiátricas y acciones que promuevan la participación activa de esta comunidad históricamente excluida. A pesar de lo anteriormente planteado, no existen en nuestro país programas comunitarios específicos desarrollados e implementados para la disminución del estigma hacia la población con patologías psiquiátricas (Gatica-Saavedra et al., 2020).

A nivel internacional existe consistente evidencia de programas aplicado en la reducción del estigma, cuyo inicio se sitúa históricamente desde la década de los 70 a partir de las experiencias de discriminación y el creciente enfoque de derechos humanos en salud (Stuart et al, 2014), destacando los siguientes programas:

-**Programa "Open the Doors" (USA, 1996):** Fue promovido por la Asociación Mundial de Psiquiatría, específicamente con el fin de combatir el estigma hacia la población con diagnóstico de esquizofrenia y considera la implementación de intervenciones educativas enfocadas en profesionales de la salud, público general, jóvenes y grupos comunitarios (Kadri & Sartorius, 2005). Actualmente, el programa se ha aplicado en más de 20 países y ha contado con la participación de la sociedad civil y privados, mostrando resultados favorables en el aumento del conocimiento de la población sobre la esquizofrenia, sin embargo, presenta brechas importantes en cuanto a la inclusión de la participación directa de los usuarios afectados (Stuart, 2008).

-**Programa "Like Minds Like Mine" (Nueva Zelanda, 1997):** Financiando por el Ministerio de Salud de Neozelandez e incluido en el plan nacional de salud mental de este país, proponiendo actividades nacionales y a nivel local-comunitario, siendo su sello la inclusión de personas que hayan experimentado una enfermedad mental, especialmente en las actividades comunitarias que favorecen el contacto directo con la población general (Ministry of Health and Health Promotion Agency, 2014). Es interesante la experiencia de inclusión de los mismos usuarios, lo que da luces de su impacto en la reducción del estigma y del costo beneficio favorable, donde de los 52 millones de financiamiento, se estiman beneficios económicos aproximadamente de 720 millones, principalmente en gastos de servicios de salud, protección social y empleabilidad (Collings et al., 2010).

-**Programa "Beyondblue" (Australia, 2000):** El proyecto considera intervenciones con diversos componentes: 1) Desestigmatizar la depresión a través de campañas mediáticas; 2) apoyar la defensa y protección de derechos de usuarios y familiares 3) promover la prevención y el tratamiento precoz; 4) promover el entrenamiento de la salud primaria y de otros niveles de salud; y 5) realizar investigación para generar evidencia científica (Hickie, 2004). Si bien esto

ha mostrado resultados favorables, logrando reducciones del estigma, junto con un aumento del conocimiento y consulta a los servicios de salud, su principal limitación es enfocarse únicamente en la depresión (Jorm et al., 2006).

-Programa "See Me" (Escocia, 2002): Su énfasis estuvo en el desarrollo de una campaña de sensibilización pública acerca del impacto del estigma en las personas con enfermedad mental. Uno de sus principales objetivos fue trabajar cercanamente con los medios de comunicación para modificar los retratos negativos acerca de los usuarios que generalmente aparecen en TV, periódicos o radio, principalmente a través de la difusión de mensajes desestigmatizantes como por ej: "Las personas con enfermedad mental si reciben un apoyo correcto, pueden recuperarse" (See Me Scotland, 2006). Si bien presenta un gran impacto mediático y estabilidad en el tiempo, no considera la participación directa de usuarios ni el contacto con la población general.

-Programa "In Our Own Voice" (USA, 2003): Considera una intervención grupal de 90 minutos de duración y conducida por dos monitores ("facilitadores"), que son a su vez personas con trastornos mentales graves que se encuentran en recuperación. El programa compromete la revisión de cinco fases definidas como "El camino hacia la recuperación": 1) "Los días oscuros", en donde se revisan las primeras experiencias de la enfermedad mental y el estrés asociado a estas; 2) "La aceptación", en donde se relata cómo las personas han llegado a entender su enfermedad; 3) "Los tratamientos", referido a qué tipo de tratamientos funcionan mejor; 4) "Mecanismos de afrontamiento", en donde se describen las estrategias utilizadas a diario para reducir el estrés; 5) "Logros, Esperanzas y Sueños", con el foco en personas que han superado su enfermedad mental y pueden continuar con sus objetivos (Corrigan et al, 2010). Lo interesante a destacar es la generación de la participación directa de los actores, facilitando el contacto e intercambio de experiencias entre ellos, junto con la generación de diversas etapas de intervención diferenciada.

-**Programa "Opening Minds" (Canadá, 2009):** En la actualidad hay más de 70 proyectos activos en todo el país que consideran la participación local de la comunidad y adaptada según cada una de ellas, lo cual lo diferencia de otras campañas con un gran coste económico y publicitario (Knaak et al., 2014). Las intervenciones son diversas, aunque la mayoría comparte el denominador común de ser lideradas por usuarios y con un fuerte componente educativo, así como un acercamiento directo entre los diversos actores, lo que ha dado resultados positivos en los distintos índices de medición y articulación de la red comunitaria (Stuart et al, 2014). Lo destacable de esta iniciativa es el considerar la participación local, la facilitación del contacto, el diseño adaptado a cada comunidad y el rol activo de los usuarios.

A nivel de resultados de las intervenciones en reducción del estigma público en salud mental, las más exitosas han sido aquellas que involucran el contacto directo con personas con problemas de salud mental (Corrigan & Wassel, 2008; Yuan et al., 2017) y programas con fuertes componentes educativos (Yin et al., 2020; Knaak et al., 2014). Se ha demostrado que el contacto directo, de persona a persona, y las actividades en las que los participantes y los usuarios de salud mental comparten pensamientos y experiencias en torno a la salud mental son clave para el éxito de estos programas (Corrigan et al., 2013; Corrigan et al., 2014; Morgan et al., 2018), siendo especialmente efectivos cuando se dirigen estratégicamente, como a grupos de profesionales y estudiantes en formación (Corrigan et al., 2014; Knaak et al., 2014). El contacto social directo y la interacción permiten a los participantes compartir reflexiones y experiencias en torno a la salud mental, lo que ha demostrado ser clave para el éxito de estos programas (Knaak et al., 2014).

Si bien estas estrategias han sido implementadas en diferentes países (Hickie, 2004; Stuart et al., 2014) y han permitido disminuir el estigma (Corrigan et al., 2010) y promover percepciones positivas de los pacientes psiquiátricos entre

estudiantes y profesionales (Corrigan, 2006, Lam et al., 2010), su implementación en espacios virtuales de aprendizaje es reciente, particularmente para estudiantes universitarios (Shann et al., 2019).

Innovación y el uso de intervenciones tecnológicas en la reducción del estigma

Las intervenciones innovadoras y eficaces entre los estudiantes universitarios para reducir la estigmatización de las personas con trastorno mental grave tienen el potencial de promover un enfoque de salud mental inclusivo y basado en la recuperación en los futuros profesionales (Arens et al., 2009; Corrigan, 2016).

En los últimos años, diversos autores han demostrado que las intervenciones innovadoras basadas en la tecnología han tenido un gran impacto en la reducción del estigma hacia las personas con enfermedad mental, principalmente debido a su adaptabilidad a diferentes contextos y rangos de edad, el que ha resultado especialmente adecuado para estudiantes universitarios (Funk et al., 2012; Lien et al., 2019).

Así, se han destacado, por ejemplo, las ventajas de utilizar recursos multimedia, por ejemplo, a través de recursos educativos audiovisuales con pacientes estandarizados (Amsalem et al., 2020) y la implementación de videojuegos educativos (Cangas et al., 2020; Mullor et al., 2019). El uso de estos videojuegos se ha destacado como una herramienta eficaz para reducir la sintomatología ansiosa y depresiva en pacientes, y ha sido útil para reducir las ideas erróneas y la estigmatización sobre enfermedades mentales graves, como la esquizofrenia o el trastorno bipolar (Lau et al., 2016).

Más recientemente, se han implementado intervenciones a través de la realidad virtual e inmersiva (Emmelkamp & Meyerbröker, 2021) y el contacto electrónico a través de videollamadas y chat en línea con personas con problemas de salud

mental (Maunder et al., 2019). Dado el reciente desarrollo de estas dos últimas estrategias, estas se describen con mayor profundidad a continuación.

Contacto electrónico (**E-contact) como estrategia innovadora en la reducción del estigma en salud mental**

Como estrategia de intervención innovadora, el contacto electrónico [e-contact en inglés] -definido como "interacciones en tiempo real mediadas por ordenador en las que miembros de diferentes grupos interactúan en línea a través de medios virtuales con usuarios de servicios de salud mental" (White & Abu-Rayya, 2012, p. 598)- se ha utilizado como estrategia para promover la sensibilización y reducir los prejuicios entre grupos ideológicamente diferentes (White et al., 2019) y población transgénero (Boccanfuso et al., 2020). Sin embargo, la implementación del e-contact en el campo de la reducción del estigma es reciente, donde se ha demostrado que el e-contact mediante chat y videoconferencia sincrónica puede reducir la ansiedad, el estigma y los estereotipos hacia la población afectada por trastornos mentales, y promover una actitud inclusiva, a través de la reducción de la ansiedad, la rabia y los estereotipos hacia los individuos con esquizofrenia (Maunder et al., 2018, White et al., 2019).

Estos enfoques fomentan el desarrollo de habilidades y proporcionan herramientas para promover la inclusión, dado que permite a los estudiantes reflexionar y desarrollar habilidades y conocimientos, junto con promover la empatía y sensibilización (Martin et al., 2020), incorporando los fundamentos, principios y evidencia de efectividad de las intervenciones clásicas que utilizan el contacto directo con usuarios de salud mental.

Realidad virtual como estrategia en la reducción del estigma en salud mental

La realidad virtual aplicada a la salud mental se refiere al uso de entornos virtuales generados por computadora para ofrecer intervenciones terapéuticas, evaluaciones o apoyo relacionado con la salud mental (Kyaw et al., 2019). Esta

tecnología inmersiva proporciona una experiencia simulada que activa y estimula múltiples sentidos del usuario, permitiéndole interactuar con entornos virtuales de manera realista (Son et al., 2022).

La aplicación de la realidad virtual e inmersiva en entornos educativos y de salud mental es cada vez más frecuente (Aitamurto, 2019), donde a través de la creación de espacios virtuales interactivos de 360º, se ha demostrado el impacto de intervenciones a nivel cognitivo y emocional, que pueden generar cambios actitudinales y conductuales a través de la educación, la promoción de la empatía y la reducción de sesgos explícitos e implícitos (Barreda-Ángeles et al., 2020). La eficacia de los programas de realidad virtual inmersiva e interactiva ha sido demostrada en diferentes áreas clínicas de la salud mental, incluyendo ansiedad, depresión, psicosis y adicciones (Riva, 2022).

La aceptabilidad y eficacia del uso de las intervenciones a través de la realidad virtual en salud mental pueden explicarse por su grado de interacción en un entorno educativo e inmersivo que favorece el aprendizaje y el cambio de actitudes y creencias (Makransky & Petersen, 2021).

Así, la realidad virtual inmersiva incorpora escenarios virtuales simulados e interactivos en 3D, que permiten a los usuarios experimentar y comprender en primera persona diferentes vivencias, a la vez que permite interactuar con diversos recursos socioemocionales y educativos, lo que ha demostrado ser una herramienta prometedora para promover el desarrollo de la empatía y el cambio de actitudes (Barreda-Ángeles et al., 2020; Riva, 2022).

Específicamente en el campo de reducción de estigma público en salud mental, un estudio reciente desarrollado por Yuen et al. (2021) demostró un efecto significativo en la reducción del estigma a través del uso de realidad virtual. En esta intervención los participantes experimentaban la simulación de la vida

cotidiana y el estigma percibido como protagonista de una historia animada que representaba el vivir con ansiedad y trastorno depresivo en primera persona.

A nivel iberoamericano recientemente, en el estudio realizado por Cangas & Galvan (2020) en profesionales de la salud, se evidenció que a través del uso de la realidad virtual se redujo el estigma de forma estadísticamente significativa en estos profesionales, quiénes además evaluaron positivamente el nivel interés y utilidad del programa. Concretamente, esta intervención fue realizada través da la implementación del software *Inclúyete-VR*, cuyas características y escenarios se describe en mayor detalle a continuación.

Inclúyete-VR: Software de realidad para reducción de estigma

Inclúyete-VR es un programa de realidad virtual diseñado en España para reducir el estigma hacia las personas con trastorno mental grave, a través de una experiencia vivencial y educativa que favorece la empatía hacia las personas afectadas (Cangas & Galvan, 2020). Para el desarrollo de este programa, diversos usuarios y profesionales de la salud mental colaboraron activamente en el diseño y selección de escenarios e interacciones dentro del software.

En primer lugar, el software ofrece una breve simulación de las alucinaciones habituales en la esquizofrenia, a través de la cual se pretende que el jugador viva una experiencia similar a la de una persona que sufre un trastorno mental grave y las consecuencias psicológicas que ello conlleva (por ejemplo, sensación de angustia). Para ello, tal como se muestra en la Figura 2, inicialmente se muestra un escenario con "monstruos" (que representan alucinaciones) donde el jugador puede eliminarlos, pero llega un momento que el número de ellos y la velocidad a la que actúan hace imposible este propósito y aparece un "monstruo grande" del que solo queda huir.

A continuación, el jugador se encuentra en un "centro de crisis", donde hay otras personas que comentan que han pasado por situaciones similares y puede ir por diferentes salas y hacer distintas actividades. Posteriormente el jugador debe avanzar y superar 6 etapas interactivas, cada una de las cuales muestra diferentes recursos psicosociales disponibles para la recuperación e inclusión social (como deportes, trabajo, actividades artísticas, etc.). Inclúyete-VR pretende situar al participante en un mundo virtual que muestre cómo se vive el estigma hacia las personas con SMI, y también ofrecer alternativas de rehabilitación e inclusión social, dando así una visión menos sesgada del tratamiento contemporáneo de la salud mental.

Las diversas salas se encuentran diseñadas en formato de *escape room*, donde después de hacer cada actividad propuesta la persona va ganando una estrella y al final puede salir. Posterior a cada una de las actividades, se muestran diversos mensajes un mensaje de la utilidad de las diferentes tareas.

Figura 2. Capturas de pantalla del entorno virtual de Inclúyete-VR realizado en Oculus Quest 2.

Nota: (1) Breve simulación de alucinaciones: Varios monstruos se acercan al jugador, que puede eliminarlos disparándoles, pero finalmente aparece un monstruo que no puede ser eliminado con la frase "¡No puedes luchar, huye!"; (2) Centro de crisis: Dos personas comentan al jugador que ellos también han vivido situaciones similares a la suya y que pueden ayudarle, también informan al jugador que hay varias salas donde puede realizar diferentes actividades. A continuación, se muestra la siguiente frase "El apoyo entre iguales nos ayuda a sentirnos comprendidos".

Además, más información del programa se puede obtener en su página web (https://incluyete.blog/incluyete-vr/).

Vacío del conocimiento

A nivel internacional se han diseñado e implementado diversos programas con foco comunitario que buscan disminuir el estigma hacia la población afectada por patologías psiquiátricas con resultados favorables. Sin embargo, en el ámbito del desarrollo tecnológico, la evidencia de la efectividad y la sistematización de las intervenciones experimentales es limitada, destacando la necesidad de una mayor investigación en esta área emergente (Naslund et al., 2021; Taylor et al., 2020).

En este contexto, dado este creciente campo de aplicación de las nuevas tecnologías, surge la necesidad de realizar no solo nuevas investigaciones experimentales que aporten mayor evidencia sus efectos, sino que además sintetizar, medir y discutir críticamente los efectos y resultados de los estudios realizados para la reducción del estigma. Este enfoque se vuelve especialmente relevante, dado los considerables y rápidos avances de la tecnología aplicada a la salud mental.

Finalmente, es fundamental destacar que actualmente en Chile existe una ausencia de programas que implementen y evalúen el uso de intervenciones tecnológicas enfocadas en la reducción de estigma en salud mental. Por lo tanto, cobra vital relevancia la implementación de acciones, junto con el diseño y

evaluación de intervenciones innovadoras que no solo busquen disminuir la estigmatización desde las etapas formativas de los estudiantes, sino que también se enfoquen en reducir sus consecuencias en la población afectada en el país.

Objetivos

OBJETIVOS

Objetivo general

- Diseñar, implementar y evaluar el efecto de intervenciones con el uso de intervenciones tecnológicas en la reducción del estigma en estudiantes universitarios hacia las personas con trastorno mental grave.

Objetivos específicos

1) Diseñar, implementar y evaluar el efecto de un programa piloto multicomponente en línea en la reducción de estigma hacia las personas con trastorno mental grave en estudiantes universitarios.
2) Evaluar la eficacia de las intervenciones innovadoras basadas en la tecnología para reducir el estigma hacia las personas con problemas de salud mental y sistematizar los estudios experimentales que utilizan este tipo de intervenciones.
3) Implementar y evaluar el efecto de un programa de realidad virtual inmersiva (Inclúyete-VR) sobre los niveles de estigma de estudiantes universitarios hacia las personas con trastorno mental grave.

Hipótesis de investigación

HIPÓTESIS DE INVESTIGACIÓN

1) Existirá una disminución estadísticamente significativa en los niveles de estigma en el grupo de intervención multicomponente posterior a la intervención, no siendo el caso de los participantes del grupo control.

2) Las intervenciones experimentales basadas en la tecnología presentarán una alta heterogeneidad y tendrán efectos estadísticamente significativos en la reducción del nivel de estigma público en comparación con el grupo de control.

3) Los participantes del grupo experimental tendrán niveles significativamente más bajos de puntuaciones de estigma estandarizadas tras la intervención de realidad virtual (Inclúyete-VR) en comparación con los participantes del grupo de control.

Metodología

METODOLOGÍA

A continuación, se describe de forma sintética, las metodologías utilizadas para lograr cada uno de los objetivos planteados, en base a cada uno de los estudios que sustentan la presente tesis doctoral.

1. Diseño

Específicamente, en el estudio 1 de carácter cuantitativo denominado "Controlled Study of the Impact of a Virtual Program to Reduce Stigma Among University Students Toward People With Mental Disorders", se implementó un estudio controlado aleatorizado, donde el grupo experimental fue asignado a una intervención tecnológica multicomponente en línea enfocada en la reducción del estigma en salud mental y el grupo control fue asignado a una intervención de similares características y duración, pero no relacionada a la salud mental. Se incluyó en ambos grupos la evaluación de los niveles de estigma hacia las personas con trastorno mental grave de forma previa y posterior a la intervención, a través del uso de instrumentos validados aplicados en línea.

El estudio 2 denominado "Innovative Technology–Based Interventions to Reduce Stigma Toward People With Mental Illness: Systematic Review and Meta-analysis", se realizó una revisión sistemática y meta-análisis enfocada en evaluar la efectividad de las intervenciones basadas en tecnología para reducir el estigma hacia las personas con problemas de salud mental, la cual fue realizada a través de los lineamientos y metodología PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses).

En el estudio 3, de carácter cuantitativo denominado "Reducing Stigma Toward People with Serious Mental Illness Through a Virtual Reality Intervention: A Randomized Controlled Trial", se implementó un estudio controlado randomizado, donde el grupo experimental fue asignado a una intervención de realidad virtual inmersiva con foco en la reducción del estigma hacia las personas con trastorno

mental grave, por su parte el grupo control fue asignado a una intervención de realidad virtual no relacionada a la salud mental. Al igual que en el estudio 1, se incluyó en ambos grupos la evaluación de los niveles de estigma hacia las personas con trastorno mental grave de forma previa y posterior a la intervención, a través del uso de instrumentos validados aplicados en línea.

Debido a que los estudios 1 y 3 comparten características comunes dado su diseño experimental y el estudio 2 posee una metodología de revisión sistemática y meta-análisis, el desglose de sus aspectos metodológicos se presenta de forma separada a continuación:

2. Participantes

El muestreo para el estudio 1 y 3 fue de carácter no probabilístico y por conveniencia, los que fueron reclutados en la Universidad del Desarrollo, Chile.

En el estudio 1 participaron un total de 40 estudiantes universitarios, de los cuales 32 estudiaban carreras de ciencias de la salud y los 8 restantes carreras de ciencias sociales. El 80% de los participantes eran mujeres y el 20% hombres, todos ellos con edades comprendidas entre los 18 y los 23 años (M = 20.6; DE = 1.3). El grupo de intervención y el grupo de control estuvo conformado cada uno por 20 participantes asignados al azar, con igual proporción de hombres y mujeres, área de estudio y sin diferencias estadísticamente significativas en cuanto a la edad (p > 0.05).

En el estudio 3 participaron un total de 124 participantes universitarios, con edades comprendidas entre los 18 y los 35 años (M = 21.9; DE = 2.5), los que fueron distribuidos de forma equivalente al azar entre los grupos experimentales y control (n = 62 participantes para cada grupo). Hubo más participantes mujeres (n = 69, 55.6%) que hombres (n = 54, 43.5%); y un participante no se identificó dentro del género binario. De los estudiantes, un 29% pertenecían a las carreras del área de la salud (por ejemplo, odontología, medicina, enfermería), un 29% a la

carrera de psicología y un 23% al área de la ingeniería. El resto (19%) cursaba carreras como arquitectura, derecho, ciencias políticas y diseño gráfico, entre otras.

3. Instrumentos

*Attribution Questionnaire (AQ−27) (*Utilizado como instrumento en los estudios 1 y 3)

Este instrumento ha sido ampliamente utilizado para medir los niveles de estigma hacia las personas con enfermedad mental en la población general, a través de una escala Likert de 9 puntos (Corrigan et al., 2010). Esta presenta una viñeta de un caso de una persona diagnosticada de esquizofrenia, donde se evalúan y miden diversos estereotipos, prejuicios y conductas discriminatorias. Para este estudio se utilizó la versión breve de 14 ítems, adaptada y validada al español por Saavedra et al (2021), que posee una estructura de cuatro factores: peligrosidad-miedo, falta de solidaridad, coerción y evitación

En los estudios 1 y 3 de la presente tesis doctoral, este instrumento mostró poseer adecuada fiabilidad en el puntaje total y en cada uno de sus cuatro factores.

Questionnaire on Student Attitudes Toward Schizophrenia (QSAS) (Utilizado como instrumento en el estudio 1)

Instrumento que se encuentra enfocado en evaluar diversos estereotipos hacia la esquizofrenia y la distancia social. Este fue desarrollado Alemania, durante el Programa Mundial contra el Estigma y la Discriminación de la Asociación Mundial de Psiquiatría (Schulze et al., 2003). En el presente estudio se utilizó la versión validada en español desarrollada por Navarro et al. (2017), que posee las propiedades psicométricas adecuadas, con un alfa de Cronbach de 0.95 para ambos factores evaluados.

Learning Strategies Assessment Scale (Utilizado como instrumento en el estudio 1)

Este instrumento se diseñó de forma Ad Hoc específicamente para el presente estudio. En este instrumento, los participantes evaluaron la integración de las diferentes estrategias de intervención en una escala de 0 a 5, centrándose en el impacto percibido sobre la empatía, la comprensión de la recuperación y la inclusión social de las personas afectadas por trastornos mentales graves. Además, se evaluó el grado de recomendación del programa.

La totalidad de instrumentos utilizados en los estudios 1 y 3 de la presente tesis doctoral se encuentran disponibles como Anexo 1.

4. Procedimiento

Ambos estudios fueron aprobados por el Comité Ético Científico de la Facultad de Medicina de la Universidad del Desarrollo (números 2020-142 y 2022-43). Antes de su participación, todos los participantes realizaron la firma del consentimiento informado, donde posteriormente fueron asignados a las condiciones control y experimental se llevó a cabo de manera aleatoria.

En ambos estudios se realizó la evaluación de los niveles de estigma de forma previa y posterior a la intervención de control y experimental, a través de una plataforma en línea de forma anónima y confidencial.

Específicamente, en el estudio 1 el grupo experimental participó en un programa de intervención online multicomponente de 14 horas de duración total, que incluyó diversos recursos educativos e interactivos en línea a través del uso de actores estandarizados y el aprendizaje basado en proyectos, junto con el contacto electrónico (e-contact) a través de videoconferencia con una persona con diagnóstico de esquizofrenia, durante la cual los estudiantes pudieron interactuar y compartir experiencias sobre el proceso de recuperación en salud mental. El

grupo control participó en una intervención en línea de similar duración, pero no relacionada a la salud mental.

Por su parte, el estudio 3 el grupo de intervención experimental utilizó el Software de realidad virtual Incluye-VR anteriormente descrito, a través de las gafas de realidad virtual Oculus Quest 2 ®. Por su parte el grupo control utilizó el software de bienvenida de Oculus, no relacionado a la salud mental. El procedimiento duró entre 20 y 30 minutos por participante, con una duración similar entre los grupos de control y experimental.

5. Análisis estadístico

En ambos estudios se utilizó la prueba t de Student para muestras independientes para evaluar si existían diferencias estadísticamente significativas en los niveles previos de estigma entre los grupos control y experimental.

Concretamente, para el estudio 1 las mediciones previas y posteriores a la intervención de cada grupo se analizaron con el uso de la t de Student para muestras relacionadas, que se complementó con la medida del tamaño del efecto de la intervención a través de la d de Cohen. Además, se utilizó estadística descriptiva para el análisis de la valoración global de cada una de las estrategias de intervención. Para llevar a cabo el análisis estadístico se utilizó el programa SPSS 22.0.

Por su parte, en el estudio 3 se utilizó un modelo de ANOVA mixto de dos vías para comparar los niveles de estigma entre los distintos tiempos (previos y posterior a la intervención) y según el tipo de intervención (Inclúyete-VR o control), junto con la evaluación del efecto de interacción entre los tiempos y tipo de intervención. Se utilizó la prueba univariante de Greenhouse-Geisser para reportar la significación de los efectos principales y de interacción. Se utilizó el ajuste post hoc de Bonferroni para los contrastes múltiples. Todos los análisis de datos se realizaron con el programa SPSS versión 27.

b. Metodología estudio 2

El protocolo de revisión sistemática y metaanálisis se registró en la base de datos internacional Prospective Register of Systematic Reviews (PROSPERO) con el ID de registro CRD42021261935 y se llevó a cabo según los lineamientos PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-analyses). La búsqueda de datos se realizó de enero a julio de 2021 en cinco bases de datos: PubMed, PsycInfo, Scopus, Cochrane Library y ScienceDirect, abarcando textos desde el 5 de marzo de 2016 hasta el 5 de marzo de 2021.

Los criterios de inclusión abarcaron artículos publicados en inglés y español en revistas revisadas por pares, que fueran ensayos clínicos aleatorizados sobre tecnologías innovadoras (como aplicaciones, videojuegos, e-contacto o realidad virtual) dirigidos a reducir el estigma hacia personas con trastornos mentales. Se excluyeron estudios sin grupo de control, así como aquellos centrados en la reducción de estigma no relacionado con problemas de salud mental.

Dos investigadores realizaron de manera independiente la selección de artículos, resolviendo discrepancias con la revisión de un tercer investigador. Los resultados fueron evaluados en dos etapas: primero por título y resumen, y luego por texto completo, con las razones de exclusión registradas. La extracción de datos se realizó mediante una tabla estandarizada, revisada por un tercer autor. La calidad de los estudios se evaluó utilizando la herramienta de evaluación de riesgo de sesgo de Cochrane ROB-2.

El metaanálisis fue realizado por los investigadores utilizando el programa informático Comprehensive Meta-analysis (versión 2). El I^2 y el estadístico Q se utilizaron para explorar la heterogeneidad de los tamaños del efecto. Se utilizaron modelos de efectos aleatorios debido a la heterogeneidad en el tipo de intervención en los estudios.

Finalmente, se utilizaron procedimientos estadísticos para cuantificar el efecto del sesgo de publicación, mediante el análisis Duval and Tweedie's trim-and-fill y la aplicación de Rosenthal's fail-safe N test (Shi & Lin, 2019).

Compendio de publicaciones científicas

COMPENDIO DE PUBLICACIONES CIENTÍFICAS

A continuación, se presenta el compendio de los 3 artículos científicos que avalan la presente tesis doctoral, así como su resumen en español:

Artículo 1: Controlled Study of the Impact of a Virtual Program to Reduce Stigma Among University Students Toward People with Mental Disorders

Resumen en español:

El estigma hacia los trastornos mentales es uno de los problemas mundiales más acuciantes de la actualidad. La pandemia de Covid-19 ha exacerbado las barreras a la inclusión social a las que se enfrentan las personas con trastornos mentales. Al mismo tiempo, las intervenciones de reducción del estigma, especialmente las dirigidas a estudiantes universitarios, han sido más difíciles de aplicar debido al distanciamiento social y al cierre de campus. Como resultado, se requiere una entrega alternativa para los programas que contribuyen a la reducción del estigma, como la implementación en línea.

En este artículo se presentan los resultados de un estudio controlado centrado en un programa online multicomponente de reducción del estigma hacia la enfermedad mental que incluía aprendizaje basado en proyectos, simulaciones clínicas con pacientes estandarizados y E-Contact con pacientes reales.

En el estudio participaron 40 estudiantes de pregrado de la Universidad del Desarrollo de Santiago de Chile. Se dividieron aleatoriamente entre un grupo de intervención y un grupo de control. El grupo de intervención participó en el programa multicomponente en línea, mientras que el grupo de control participó en un programa educativo en línea sobre salud cardiovascular.

Se evaluó el impacto del programa utilizando las versiones validadas en español del Cuestionario de Atribuciones AQ-27 y del Cuestionario de Actitudes de los

Estudiantes hacia la Esquizofrenia con ambos grupos, antes y después de la intervención. Además, se utilizó una escala Likert ad hoc de 0 a 5 con el grupo de intervención para valorar las estrategias de aprendizaje implementadas.

Tras la intervención, los participantes pertenecientes al grupo de intervención mostraron niveles significativamente más bajos de estereotipos, percepción de peligrosidad y puntuación global hacia las personas con esquizofrenia (p < 0,001). Además, los participantes presentaron niveles más bajos de peligrosidad-miedo, evitación, coerción, falta de solidaridad y puntuación global (p < 0,001).

El grupo de control no mostró diferencias estadísticamente significativas en el nivel de estigma antes y después de la evaluación, para todos los ítems evaluados. Por último, la valoración global de cada uno de los componentes del programa fue altamente positiva.

En conclusión, el estudio muestra que los programas online pueden contribuir a reducir el estigma hacia los trastornos mentales. El programa evaluado en este estudio tuvo un impacto positivo en todas las dimensiones del estigma y todos los componentes del propio programa fueron evaluados positivamente por los participantes.

Controlled Study of the Impact of a Virtual Program to Reduce Stigma Among University Students Toward People With Mental Disorders

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Stigma toward mental disorders is one of today's most pressing global issues. The Covid-19 pandemic has exacerbated the barriers to social inclusion faced by individuals with mental disorders. Concurrently, stigma reduction interventions, especially those aimed at university students, have been more difficult to implement given social distancing and campus closures. As a result, alternative delivery for programs contributing to stigma reduction is required, such as online implementation. This paper reports the results of a controlled study focused on an online multi-component program on reducing stigma toward mental illness that included project-based learning, clinical simulations with standardized patients and E-Contact with real patients. A total of 40 undergraduate students from the Universidad del Desarrollo in Santiago, Chile, participated in the study. They were randomly divided between an intervention and control group. The intervention group participated in the online multi-component program, while the control group participated in an online educational program on cardiovascular health. We assessed the impact of the program by using the validated Spanish-language versions of the Attribution Questionnaire AQ-27 and the Questionnaire on Student Attitudes toward Schizophrenia with both groups, before and after the intervention. In addition, an *ad hoc* Likert scale ranging from 0 to 5 was used with the intervention group in order to assess the learning strategies implemented. Following the intervention, the participants belonging to the intervention group displayed significantly lower levels of stereotypes, perception of dangerousness, and global score toward people with schizophrenia ($p < 0.001$). In addition, participants presented lower levels of dangerousness-fear, avoidance, coercion, lack of solidarity, and global score ($p < 0.001$). The control group displayed no statistically significant differences in the level of stigma before and after the evaluation, for all of the items assessed. Finally, the overall assessment of each of the components of the program was highly positive. In conclusion, the study shows that online programs can contribute to reducing stigma toward mental disorders. The program assessed in this study had a positive impact on all the dimensions of stigma and all of the components of the program itself were positively evaluated by the participants.

Keywords: stigma, undergraduate education, E-contact, standardized patient (SP), project based learning (PBL), multicomponent interventions, stigma reduction programme

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INTRODUCTION

Stigma toward mental disorders is one of today's most pressing global issues. (1), with important implications such as high levels of social exclusion (2), poor quality of life (3), and low social support (4), for those affected by them. Furthermore, there are barriers to access and continuity of education and employment (5, 6), and higher risks of dying by suicide (6) among this specific population.

Mental health professionals and medical students have been found to stigmatize psychiatric patients (7, 8), and 40% of people with a mental disorder report unfair treatment by health professionals such as medical doctors, psychiatrists, psychologists, and nurses (9, 10). Experiencing stigma in medical settings is a stressor that contributes, among others, to reducing patients' quality of life and to exacerbating inequities in health outcomes and access to healthcare (11–13). Furthermore, stigma is considered a major obstacle against processes of mental health recovery (14–16) and is a main determinant of the quality of care delivered by health professionals and medical students (17, 18).

At the international level, several strategies have been implemented within the general population, as well as medical students, to reduce stigma toward mental disorders (19), and the most successful ones have been those involving direct contact with patients (20, 21) as well as programs with strong educational components (16, 22–24). It has been shown that direct, person-to-person contact and activities where the participants and patients share thoughts and experiences around mental health are key to the success of these programs (25–27).

While these strategies have been implemented in different countries (28–30) and have led to decreasing stigma (31, 32) and promoting positive perceptions of psychiatric patients among students and professionals (33, 34), their implementation in virtual learning spaces is recent, particularly for university students (35). Several authors highlight the advantages of using multimedia resources, for instance audiovisual educational resources with standardized patients (36, 37), E-contact with psychiatric patients (38), and even the implementation of educational videogames (39, 40).

In the context of the SARS-CoV−2 pandemic, lockdowns and physical distancing recommendations, stigmatization and instances of discrimination against individuals with mental disorders have increased and have negatively impacted their well-being and quality of life (41). Additionally, the implementation of measures aimed at reducing the transmission of the virus have hampered the implementation of on-site interventions focused on the reduction of stigma toward psychiatric patients (42), and in that context, developing and implementing innovative and online alternatives is paramount.

Among such alternatives, for university students, active and interdisciplinary project-based learning, where students lead and develop a final project, has been proven useful (43, 44), as it promotes critical thinking, practical application of knowledge (45), and problem-solving skills (46). Its implementation in the training of health professionals on mental disorders is recent, however it has proven to effectively foster professional skills (47) and a comprehensive and inclusive understanding of the different social processes involved in mental health outcomes and care (48–50). As it allows students to reflect on their knowledge to implement their skills in a creative way (51), it is considered an innovative educational tool for the reduction of stigma toward mental health disorders and psychiatric patients.

In addition to project-based learning, the use of standardized patients has shown different benefits for skill training and e-learning in the field of education in psychiatry and mental health (52). Including it as part of educational intervention strategies has had a positive impact (53), particularly on skill and knowledge development, and for the promotion of a holistic understanding of mental disorders (54). However, working online rather than on-site with standardized patients in order to reduce stigma toward mental disorders is a recent, underexplored development in the field, which requires complementary educational interventions (37), along with the creation of original scripts focused on the story around experiencing the illness and the recovery process (55, 56).

Finally, E-contact, defined as "computer-mediated real-time interactions where members of different groups interact online" (57), has been used as a strategy for raising awareness and reducing prejudice among ideologically different groups (58, 59). However, its implementation in the field of stigma-reduction is new and innovative, and the existing evidence shows that it can reduce stigma toward the transgender population (60). With regards to the use of E-contact to reduce stigma toward mental disorders, to date, only one experimental study has been conducted, and has demonstrated that E-contact reduces anxiety, rage and stereotypes toward individuals with schizophrenia (38). In that sense, this confirms the relevance of including E-contact in interventions aimed at reducing stigma toward people with mental disorders, for instance through the use of synchronous videoconferencing (61).

The objective of this study is to demonstrate the effectiveness of a multi-component online intervention incorporating E-contact with mental healthcare patients, standardized patients, and a project-based learning program.

MATERIALS AND METHODS

Participants

The participants were recruited within the Universidad del Desarrollo in Santiago, Chile, during "Innovation Week," an event organized by the university, where students belonging to the first 3 years of undergraduate studies in different disciplines work on different innovative responses to local social issues.

The sample consisted of 40 university students in their first, second or third year, 32 of which studied health science degrees and the remaining 8 studied social science degrees. Eighty percent of the participants were women and 20% were men, all aged between 18 and 23 years old (X = 20.6; SD = 1.3). None of the participants had been trained in psychiatry.

The intervention group and control group were each made of 20 randomly allocated participants, with equal proportion of men and women, area of study, and no statistically significant difference with regards to age ($p > 0.05$).

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Instruments

Questionnaire on Student Attitudes Toward Schizophrenia (QSAS)

This instrument (62) aimed at evaluating the items of stereotyping toward schizophrenia and social distancing was developed for, and implemented with, high school students in Germany, during the World Program Against Stigma and Discrimination of the World Association of Psychiatry. The current study used the validated Spanish-language version developed by Navarro et al. (63), which possesses the appropriate psychometric properties, with a Cronbach's alpha of 0.95 for both evaluated factors.

Attribution Questionnaire (AQ−27)

This instrument (64) is used to quantify stigma toward people with mental disorders among the general population. It presents the participants with the case of a person diagnosed with schizophrenia and evaluates stereotyping and prejudice through a 9-point Likert scale. The current study used the Spanish-language, shorter version with 14 items, validated by Saavedra et al. (65), which possesses the appropriate psychometric properties for its four factors. (dangerousness-fear = 0.88, lack of solidarity = 0.837, coercion = 0.864, and avoidance = 0.758).

Learning Strategies Assessment Scale

This instrument was designed specifically for the current study. Participants assessed the integration of the different intervention strategies on a scale of 0 to 5, focusing on the perceived impact on empathy, understanding of recovery and social inclusion of people affected by severe mental disorders. In addition, the degree of recommendation of the program was assessed. The scale is available as **Supplementary Material**.

Procedure

Prior to their participation in either group, the participants gave their written informed consent in accordance with the Declaration of Helsinki (66) and the Singapore statement on research integrity (67). The study was approved by the Ethics Committee of Universidad del Desarrollo, Santiago, Chile (protocol number: 2020–142). Once the participants were randomly allocated to the intervention and control groups, they all completed the AQ−27 and QSAS questionnaires described previously. These questionnaires were sent to the participants 15 min before the beginning of the study and were completed online. The experiment began once the participants had completed both questionnaires.

With respect to the intervention, the intervention group participated in the multi-component online program, which lasted 14 h equally distributed across two days. The program consisted of the three consecutive interventions described below:

a. Two sessions including a simulation with standardized patients with emotional, substance use and anxiety disorders and an education workshop. These common mental disorders are psychiatric comorbidities and are highly prevalent among patients with schizophrenia (68, 69). An online presentation was carried out by two trained actors focused on the main characteristics of these disorders. Previous to the presentation, the research team had designed original scripts based on the recovery process of the patient and their family environment. During every simulation, dynamic interactions took place between the trained actors and the students, who asked them, for instance, about their life-experience, how they were feeling, etc. Additionally, an educational workshop was carried out for each simulation, in order to discuss the essential aspects of the mental disorders presented during the simulation. Each session lasted 2.5 h.

b. E-contact activity with an adult diagnosed with schizophrenia, who discussed and analyzed their recovery process with the students, including the role of the healthcare system, the community and their family. This activity lasted 3.5 h.

c. Project-Based Learning. During the two days of the program, activities aimed at developing an intervention around the reduction of stigma and the promotion of social inclusion for people with mental disorders, designed and led by the students were implemented. At the end of the second day, the students had the opportunity to present, in a webinar, the interventions they had developed throughout the course of the program, to the other participants and to the members of the evaluation jury, which included the patient with whom the E-contact activity was carried out. This allowed the participants to receive feedback from an individual who had experienced a severe mental disorder. The presentations were carried out in groups, and the interventions introduced were related to the promotion of social inclusion and the rights of people affected by mental disorders in the academic and local community, with emphasis on raising awareness around stigma and education on mental health. This activity had a duration of 5.5 h, distributed between the development of the initiative, tutoring from the teaching team and the final presentations. An example of one of the projects carried out by the students is available as **Supplementary Material**.

The control group participated in an online educational program on cardiovascular health of the same duration.

Finally, at the end of both days, each group answered the AQ-27 and QSAS questionnaires. Additionally, the intervention group completed the Learning Strategies Assessment Scale.

Figure 1 summarizes the whole procedure of the study.

Statistical Analysis

Student's t-test for independent samples was used to assess whether there were statistically significant differences between the pre- and post-intervention measures in both groups. Additionally, Cohen's d was used to determine the effect size of the intervention.

The pre- and post-measures of each group were subsequently analyzed with the use of Student's t for related samples, which was complemented with the measure of the effect size of the intervention through Cohen's d. Finally, descriptive statistics were used for the analysis of the global assessment of each one of the intervention strategies. We used SPSS 22.0 software to carry out the statistical analysis.

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FIGURE 1 | Participant assignment procedure to the multicomponent intervention [MCI].
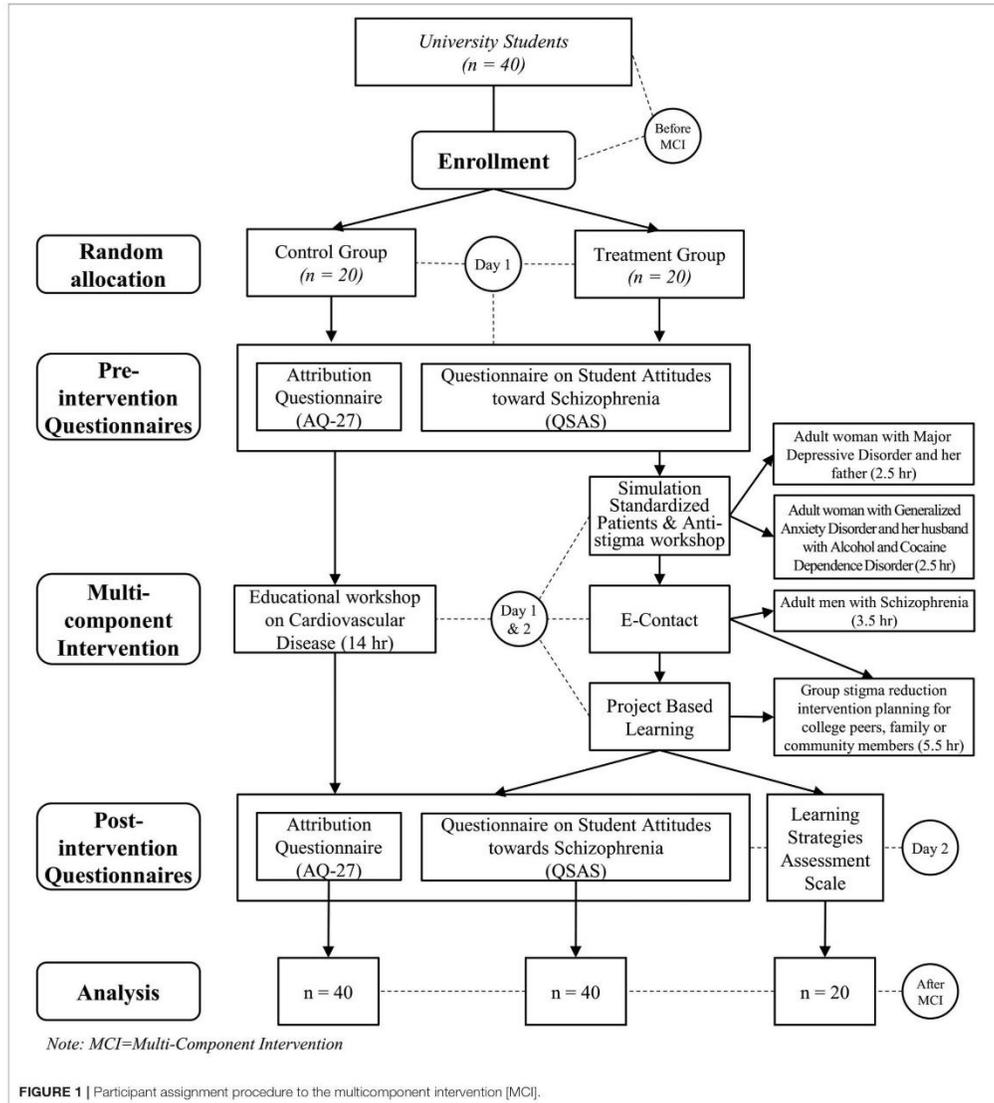
RESULTS

As **Table 1** shows, there is no statistical difference between the intervention and control groups prior to the intervention for any of the items of either instruments. However, statistically significant differences are observed for the group means in the post-intervention measures for both groups for all of the analyzed variables. Using Cohen's d effect size allowed us to determine a great effect size for all of the dimensions evaluated for both instruments, except for the

TABLE 1 | Student's *t*-test for independent samples of pre-test and post-test differences between the intervention group and control group.

Variable	Pre-test			Post-test		
	t	*p*	*d*	*t*	*p*	*d*
QSAS						
Dangerousness	0.48	0.63	0.16	4.88	0.000	1.45
Stereotypes	−0.45	0.65	−0.16	2.10	0.04	0.76
Total	0.09	0.92	0.03	4.24	0.000	1.40
AQ−27						
Dangerousness-Fear	0.27	0.78	0.08	9.76	0.000	2.27
Avoidance	−1.83	0.08	−0.47	6.29	0.000	1.81
Coercion	−0.69	0.49	−0.26	6.88	0.000	2.25
Lack of Solidarity	0.98	0.33	0.31	3.27	0.004	1.00
Total	−0.38	0.70	−0.11	11.61	0.000	2.64

QSAS, Questionnaire on Student Attitudes toward Schizophrenia, Adapted from Schulze et al. (62).
AQ−27 = Attribution Questionnaire, Adapted from Corrigan et al. (64).

stereotypes indicator, which displays a more conservative effect size.

Table 2 shows the average means and standard deviations for each variable for both instruments corresponding to the intervention and control groups for each phase of the study. The analysis of the post-intervention scores of the control group shows that there is no statistically significant difference for any of the variables studied in either instruments. However, statistically significant differences are observed in the same analysis of the scores for the intervention group, for all of the scores of the questionnaires in relation to stigma in every proportion. Regarding the effect size, the program had a positive impact on stigma reduction as reflected on each one of the analyzed items and the global score of both questionnaires.

The assessment given by the participants on the intervention was measured with a Likert scale ranging from 0 to 5 points. As **Table 3** shows, 95% (*n* = 19) of the students assessed at the top level the usefulness of the program in understanding the recovery process and promoting social inclusion of patients with severe mental disorder, while 100% (*n* = 20) of them rated at the top level the promotion of empathy. Additionally, 95% (*n* = 19) stated they would recommend this program to a peer. There was no statistically significant differences between the three interventions and their integration. Finally, positive and uniform comments were presented, also in conjunction with the following representative verbatim quotes: "The activities we carried out, helped me to have a better view of mental illness, and the use of simulated patients was useful in the experience and learning"; "I really liked the simulations and the E-Contact, it makes it much more didactic to learn and understand about mental illness" and "was a wonderful experience, it would be a huge challenge to do it on-site."

DISCUSSION

Stigma toward mental disorders is a pressing issue, considering, on the one hand, its impact on the wellbeing and quality of life of individuals with mental disorders (14–19), and on the other

hand, that it is pervasive among the general population, health professionals and university students (7–10, 70–72).

At present, and to the best of our knowledge, there is no multi-component program focused on stigma toward mental disorders entirely carried out online. For this reason, as well as the lockdowns and social distancing measures implemented as a result of the SARS-CoV−2 pandemic, this study focuses on the implementation of an online program.

The results show that the intervention had a positive impact on the reduction of stigma among the intervention group. These results may be explained by the intensity of the program, the integration of multiple components, the focus given to the recovery process and the implementation of direct E-contact between mental health patients and students, all of which have been demonstrated to be key points for the implementation of a successful stigma-reduction program (54–58, 73–77). Additionally, further studies comparing the effectiveness of implementing the multicomponent program on-site rather than online, are necessary. Other studies have shown that comparable online interventions have an impact similar to those implemented on-site (27, 78).

Considering that the intervention was intensive, taking into account the number of activities carried out in a short amount of time, further qualitative studies will explore the experience of the participants and the lessons learned from the implementation of the key components, in order to adapt and adjust the program and make it easier to replicate.

It is important to emphasize that the assessment that the students made of the program was positive with respect to online implementation for each of its components, and the components focused on the promotion of empathy, social inclusion and understanding of the recovery process of severe mental disorders scored the highest, especially when integrated together. This suggests that the participants enjoyed the experience, would recommend it to peers, bringing evidence on the advantages of interventions that take into account the motivation of university students toward learning and goal-achievement, which is in turn one of the main challenges of digital education (79, 80).

TABLE 2 | Means and standard deviations of pre-test, post-test, and Student's *t*-test for related samples of post-test–pre-test differences in the study variables for the intervention group and control group.

Variable	Intervention group							Control group						
	Pre-test		Post-test		Pre-post			Pre-test		Post-test		Pre-post		
	M	SD	M	SD	t	p	d	M	SD	M	SD	t	p	d
QSAS														
Dangerousness	3.20	2.37	1.15	1.53	3.00	0.007	1.02	3.55	1.70	3.45	1.63	0.80	0.42	0.05
Stereotypes	3.05	1.50	1.90	1.25	2.52	0.02	0.83	2.8	1.47	2.95	1.46	−1.14	0.26	−0.10
Total	6.25	3.43	3.05	2.16	3.24	0.004	1.11	6.35	2.64	6.40	2.60	−0.43	0.66	−0.01
AQ−27														
Dangerousness-Fear	17.4	7.54	7.5	2.81	6.41	0.000	1.73	18.05	7.2	18.3	6.08	−0.56	0.58	−0.03
Avoidance	11.85	4.34	4.2	1.67	8.66	0.000	2.32	9.60	5.09	10.05	4.23	−1.33	0.19	−0.09
Coercion	10.9	4.62	4.65	1.87	7.70	0.000	1.77	9.85	3.16	10.20	2.93	−1.27	0.21	−0.11
Lack of Solidarity	7.05	3.10	5.00	1.52	3.66	0.002	0.83	8.15	3.88	7.7	3.46	2.01	0.05	0.12
Total	47.2	14.22	21.35	6.52	9.90	0.000	2.33	45.65	13.57	46.25	11.58	−0.88	0.38	−0.04

QSAS, Questionnaire on Student Attitudes toward Schizophrenia, Adapted from Schulze et al. (62).
AQ-27, Attribution Questionnaire, Adapted from Corrigan et al. (64).

TABLE 3 | Intervention group participants who rate the integration of learning strategies at the top level (n = 20).

Variable	Integration of the 3 types of learning strategies	
	n	%
Understanding of recovery of SMD	19	95
Promotion of empathy toward SMD	20	100
Promotion of social inclusion of SMD patients	19	95
Would recommend the program to a peer	19	95

SMD, Severe Mental Disorder.
Top level rate, Top score of Learning Strategies Assessment Scale (5 points).

In that sense, the educational intervention methods used in the current study are supported by robust theoretical and empirical evidence, and are especially adequate for online implementation, which is key in the context of the SARS-CoV-2 pandemic and the restriction of on-site interventions (36–40, 53–56). This also represents an opportunity for future integration of similar programs in university curricula, as they offer the possibility to reach remote areas, to establish contact between people with different experiences around mental disorders and between patient communities through E-contact and to generate student-led projects. Furthermore, the online modality of these programs promotes collaborative work between individuals and institutions across different countries, contributing, on the one hand, to foster cultural diversity, and on the other hand, to develop international education networks (81, 82).

In conclusion, the design and implementation of this type of interventions and educational spaces focused on diminishing stigma toward psychiatric patients contribute to normalizing these experiences among the population, by openly sharing challenges around mental health and promoting effective help-seeking and the delivery of adequate treatment to those who need it (83, 84). The study shows that online programs can promote new types of interventions aimed at reducing stigma not only in a context of mandatory social-distancing and lockdowns due to the SARS-CoV-2 pandemic, but also complementing existing on-site programs.

However, the study presents several limitations. First, the sample is relatively small, comes from one specific institution and is not representative of the general population, which may undermine the generalization of the results and limit the interpretation of the effect size. Second, the phases of the intervention were not experimentally evaluated in an independent way and the measure of stigma was only evaluated for schizophrenia, making it necessary to include other prevalent mental disorders in future research. Third, specific characteristics of the participants and possible confounding factors, which may influence the results, such as their socio-cultural background and their level of knowledge, desire to work in psychiatry and closeness to mental disorders were not evaluated. Finally, the long duration of the program may limit its replication, presenting several logistical challenges in its implementation through virtual platforms, specifically when considering factors such as student motivation and the exhaustion experienced in this regard.

DATA AVAILABILITY STATEMENT

The datasets presented in this study can be found in online repositories. This data can be found here: https://data.mendeley.com/datasets/p5d39f3kp6/1.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Ethics Committee of Universidad del Desarrollo, Santiago de Chile (protocol number: 2020–142). The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

MR-R, AJC, and DF-O contributed to the conception, coordination, and design of the work. MR-R and DF-O contributed to the implementation of the program. MR-R and AJC performed the statistical analysis. All authors contributed to the article and approved the submitted version.

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SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyt.2021.632252/full#supplementary-material

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Artículo 2: Innovative Technology–Based Interventions to Reduce Stigma Toward People with Mental Illness: Systematic Review and Meta-analysis.

Resumen en español:

Introducción: El estigma hacia las personas con enfermedades mentales presenta graves consecuencias para los individuos afectados, como la exclusión social y mayores dificultades en el proceso de recuperación. Recientemente, se han desarrollado varias intervenciones para mitigar el estigma público, basadas en el uso de tecnologías innovadoras, como la realidad virtual y los videojuegos.

Objetivo: Esta revisión tiene como objetivo revisar sistemáticamente, sintetizar, medir y discutir críticamente los estudios experimentales que miden el efecto de las intervenciones tecnológicas en los niveles de estigmatización.

Métodos: Esta revisión sistemática y metaanálisis se basó en las directrices PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-analyses) e incluyó estudios en inglés y español publicados entre 2016 y 2021. Se realizaron búsquedas en 5 bases de datos diferentes (es decir, PubMed, PsycInfo, Scopus, Cochrane Library y ScienceDirect). Solo se incluyeron ensayos controlados aleatorizados. Dos revisores independientes determinaron la elegibilidad, extrajeron los datos y calificaron la calidad metodológica de los estudios. Los metanálisis se realizaron mediante el programa informático Comprehensive Meta-Analysis.

Resultados: Sobre la base de los 1158 artículos examinados, se evaluaron 72 artículos a texto completo, de los cuales 9 se incluyeron en las síntesis cualitativas y cuantitativas. Se observó una diversidad de intervenciones, incluyendo videojuegos, simulación audiovisual de alucinaciones, realidad virtual y contacto electrónico con usuarios de servicios de salud mental. El meta-análisis (n=1832 participantes) demostró que estas intervenciones tenían un efecto medio

consistente en la reducción del nivel de estigma público (d=-0.64; IC 95% 0.31-0.96; p < .001).

Conclusiones: Las intervenciones innovadoras que involucran el uso de tecnologías son una herramienta efectiva en la reducción del estigma, por lo que se proponen y discuten nuevos retos para la demostración de su adaptabilidad a diferentes contextos y países, que conduzcan a su masificación.

Registro: PROSPERO Registro Internacional Prospectivo de Revisiones Sistemáticas CRD42021261935; https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42021261935

Keywords: Stigma; mental illness; technology-based; serious games; virtual reality; e-contact; simulation intervention; internet intervention; meta-analysis

Review

Innovative Technology–Based Interventions to Reduce Stigma Toward People With Mental Illness: Systematic Review and Meta-analysis

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Abstract

Background: Stigma toward people with mental illness presents serious consequences for the impacted individuals, such as social exclusion and increased difficulties in the recovery process. Recently, several interventions have been developed to mitigate public stigma, based on the use of innovative technologies, such as virtual reality and video games.

Objective: This review aims to systematically review, synthesize, measure, and critically discuss experimental studies that measure the effect of technological interventions on stigmatization levels.

Methods: This systematic review and meta-analysis was based on PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-analyses) guidelines and included studies in English and Spanish published between 2016 and 2021. Searches were run in 5 different databases (ie, PubMed, PsycInfo, Scopus, Cochrane Library, and ScienceDirect). Only randomized controlled trials were included. Two independent reviewers determined the eligibility, extracted data, and rated methodological quality of the studies. Meta-analyses were performed using the Comprehensive Meta-Analysis software.

Results: Based on the 1158 articles screened, 72 articles were evaluated as full text, of which 9 were included in the qualitative and quantitative syntheses. A diversity of interventions was observed, including video games, audiovisual simulation of hallucinations, virtual reality, and electronic contact with mental health services users. The meta-analysis (n=1832 participants) demonstrated that these interventions had a consistent medium effect on reducing the level of public stigma ($d=-0.64$; 95% CI 0.31-0.96; $P<.001$).

Conclusions: Innovative interventions involving the use of technologies are an effective tool in stigma reduction, therefore new challenges are proposed and discussed for the demonstration of their adaptability to different contexts and countries, thus leading to their massification.

Trial Registration: PROSPERO International Prospective Register of Systematic Reviews CRD42021261935; https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42021261935

KEYWORDS

stigma; mental illness; technology-based; serious games; virtual reality; e-contact; simulation intervention; internet intervention; meta-analysis

Introduction

Stigma Toward People With Mental Illnesses

Globally, stigma toward people with mental illness represents a serious public health problem and is considered the main barrier to social inclusion and participation of those impacted. It has a negative effect on their quality of life, worse therapeutic results, and even an increased risk of suicide and mortality [1-3].

Thus, discrimination, prejudice, and stereotypes present in society not only severely impact the recovery process, quality of life, and well-being of people with mental illnesses and their families, but also represent the main gap in accessing specialized mental health services by the general population [4,5]. The aforesaid has great relevance in the global context, where research has shown the presence of high levels of discrimination, stigma, and prejudice toward those impacted by mental health problems, especially schizophrenia and bipolar disorder [6,7].

Innovative Interventions Carried Out at International and National Levels

Faced with the high levels of stigmatization present in society, several initiatives and studies have been conducted that focused on its reduction. It has been demonstrated that direct contact with people with mental illnesses and educational initiatives are essential and effective interventions to reduce stigma [8,9]. Although direct face-to-face contact with people with mental illness has been shown to be a key component of successful stigma reduction programs, their implementation in virtual learning and innovative spaces is recent [10]. In the last years, several authors have shown that innovative technology-based interventions have had a great impact on the reduction of stigma toward people with mental illness, mainly due to its adaptability to different contexts and age ranges [11]. Among this type of interventions, the use of video games has been highlighted as an effective tool to reduce anxious and depressive symptomatology in patients, and has been useful to reduce misconceptions and stigmatization about severe mental illnesses, such as schizophrenia or bipolar disorder [12,13].

In addition, because of the growth of technologies, the application of virtual and immersive reality in mental health has become increasingly common [14]. For example, it has demonstrated its utility in the treatment of mental health problems, such as phobias and anxiety symptoms, among others [15], along with a reduction of the negative perceptions and attitudes toward people with mental illnesses [16]. This usefulness and effectiveness can be explained by the degree of immersion in a strongly educational environment, which promotes the change of attitudes and beliefs [17]. By contrast, the use of simulation platforms has showed controversial results, with some studies showing an increase of stigmatization when used through the simulation of hallucinatory symptomatology, which can promote negative beliefs and attitudes toward people with mental illness [18,19].

Finally, as an innovative intervention, electronic contact (e-contact)—defined as "computer-mediated real-time interactions where members of different groups interact online" through virtual media with mental health services users [20]—has been used as a strategy for promoting awareness and reducing prejudice among ideologically different groups [21]. However, e-contact implementation in the field of stigma reduction is new and innovative, and it has been demonstrated that e-contact using chat and synchronous videoconferencing can reduce anxiety, stigma, and stereotypes toward the population impacted by mental disorders, and promote an inclusive attitude [11,22].

Despite the considerable progress in this field, further research is needed on innovative technologies and their application in mental health care, such as advances in detection, treatment, and promotion of inclusion and well-being of people with mental health problems [23,24]. Regarding this growing field of application of new technologies and the need to synthesize, measure, and critically discuss the effects of the studies performed for the reduction of stigma, the objectives of this systematic review and meta-analysis are to assess the effectiveness of technology-based interventions to reduce stigma associated with people with mental health problems and to describe the experimental studies that use these types of interventions.

Methods

Data Sources and Search Strategy

The systematic review and meta-analysis protocol were registered in the Prospective Register of Systematic Reviews (PROSPERO) international database (registration ID: CRD42021261935) and was conducted according to the guidelines and recommendations of the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-analyses) [25].

From January to July 2021, searches were conducted from the following 5 databases, including texts dated from March 5, 2016, to March 5, 2021: PubMed, PsycInfo, Scopus, Cochrane Library, and ScienceDirect, using the following string of search terms: [technology or technologies or simulation or virtual or digital or Internet or web or games or computer or app or online or electronic or social media] AND [stigma or discrimination or prejudice or negative attitude or stereotypes] AND [mental health or mental disorder or mental illness or schizophrenia or psychosis or bipolar disorder or depression].

In addition, a final manual trace back literature search was conducted in August 2021 to identify any recently published sources/literature.

Inclusion and Exclusion Criteria

Published articles that met the following criteria were included: (1) randomized controlled trials using innovative technologies (defined as software apps used with smartphone, videogames, e-contact, or virtual reality); (2) interventions aimed at reducing stigma toward people with mental illness (eg, schizophrenia, psychosis, or bipolar disorder), which included at least one relevant quantitative measure of public stigma (eg, attitudes, stereotypes, and social distance); (3) interventions relevant for any populations (eg, students and general population); (4) all age groups; and (5) articles written in English and Spanish, published in peer-reviewed journals.

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Exclusion criteria were (1) reduction of stigma not related to mental health problems; (2) technology using only video or education (eg, films or presentations) not combined with any other innovative technology (eg, virtual reality, videogames, or e-contact); (3) reduction focused on self-stigma only; (4) interventions focused on stigma toward psychiatry or addictions; (5) research protocols; (6) measurement of stigma; and (7) studies that did not include a randomized control group as a comparison.

Study Selection and Data Extraction

After excluding duplicates using Endnote reference manager software, 2 researchers (MER-R and AJC) independently selected articles for inclusion. A third investigator (LAC) examined all the included articles to review this selection and resolve discrepancies. In addition, to check and ensure consistency and clarity at the screening and coding stages across studies, we calculated the interrater reliability using the Cohen κ coefficient [26]. We obtained a Cohen κ of 0.75 (SE 0.11), demonstrating a medium to high degree of agreement among coders. Following this calculation, coders (MER-R and AJC) reviewed the articles in which they found disagreements, and any discrepancies were resolved by a consensus discussion with a third investigator (LAC) who was not involved in the searches.

The eligibility of search results was examined in 2 stages: first by title and abstract, and then by full text. Reasons for exclusion were recorded for each document excluded.

Data were extracted using a standardized table format, which was then reviewed by a third author (LAC). Characteristics of each article included the study design, sample size, setting, type of new technology applied, control or comparison intervention, as well as the main outcomes and effect sizes of the interventions. In the cases where the data for the calculation of the effect size were incomplete, we contacted the principal investigator to request the necessary additional information.

Quality and Risk-of-Bias Assessment

To assess the quality of the selected articles, 2 researchers (MER-R and AJC) independently assessed the risk of bias (ROB) of each study using the Cochrane ROB-2 assessment tool, which assesses 7 study design quality criteria (ie, random sequence generation, allocation concealment, blinding of participant and personnel, blinding of outcome assessment, incomplete outcome data, selective reporting, and other bias), graded as high, medium, or low risk [27]. Discrepancies were

resolved by further discussions and consensus among the authors. Figure 2 summarizes the assessment of the ROB, which was performed using the robvis visualization tool.

The use of the funnel plot for the evaluation of publication bias was not incorporated, because it has been demonstrated that its use is not reliable when the number of studies pooled in direct comparison is less than 10 [27].

Statistical Analysis

The meta-analysis was conducted by researchers (SV and MER-R) using the Comprehensive Meta-analysis software (version 2) [28]. Standardized mean difference and the inverse variance method with a 95% CI were used for continuous and normally distributed data, respectively. The I^2 and Q-statistic were used to explore heterogeneity of effect sizes [29]. Random effects models were used due to the heterogeneity in the type of intervention in the studies [30].

As 3 of the studies included more than 1 scale that assessed levels of stigma [11,22,31], we conducted an analysis that combined them into a single effect size. In those cases, we followed the methodology suggestion for complex data structures [30]. As a consequence, we computed a summary effect including the multiple measures; this synthetic effect size was then included in the meta-analysis.

In addition, as 2 of the studies [32,33] reported their results through standardized regression, the β coefficients were entered into the comprehensive meta-analysis software (CMA) as correlation coefficient, according to the recommendations of Peterson and Brown [34].

In addition, we used statistical procedures to quantify the effect of publication bias, by Duval and Tweedie's trim-and-fill analysis and Rosenthal's fail-safe N test [35].

Results

Output of Searches

Of the 2876 studies retrieved from the selected databases, 1718 duplicates were removed and 1158 were screened. Upon the screening of the titles and abstracts, 1086 studies were removed. For the remaining 72 studies, their full texts were checked, among which an additional 63 were removed due to specific reasons (Figure 1). Only 9 articles presented enough statistical data for meta-analysis.

Figure 1. Flowchart of the systematic review process.
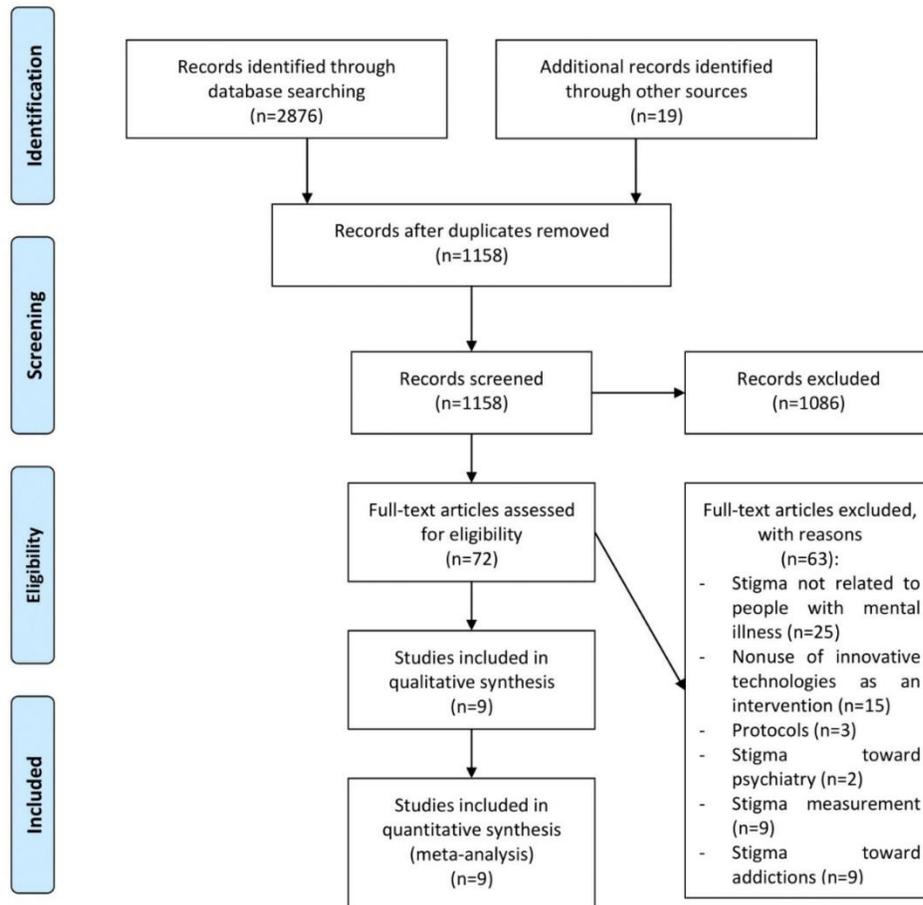
Characteristic of Included Studies

The characteristics of the included studies are presented in Table 1. A total of 9 randomized control trial studies were included, which utilized a variety of technology-based interventions to reduce stigma, including interventions using video games (n=4), audiovisual simulation of hallucinations (n=1), virtual reality (n=2), and the use of e-contact with mental health services users through videoconferencing and online chats (n=2). Most of these studies were conducted with undergraduate students (8/9,

89%). As many as 4 studies (44%) were conducted in Europe, 2 (22%) in North America, and only 1 each in Asia (11%), Australia (11%), and Latin America (11%). Most of the participants were female. The proportion of female participants ranged from 50.3% to 81.1%, and the mean age of the participants ranged from 15.7 to 24 years. Public stigma in the studies was measured through different scales, with the most commonly used being the Attribution Questionnaire and the Questionnaire on Student Attitudes Toward Schizophrenia.

Table 1. Characteristics of selected studies (n=9).

Experimental intervention	Control group	Sample size	Population	Mean age (SD)	Female, %	Public stigma scale	Outcome public stigma scale (EG[a] and CG[b])	Study
e-Contact with a person diagnosed with schizophrenia through an online chat.	Group without intervention.	133	UGS[c]	18.8 (1.5)	64.7	• AQ-ER[d]	• EG: Decreasing stigma in the factors Fear ($d=-0.87$; $P<.001$) and Anger ($d=-0.65$; $P<.001$) compared with the control condition. Pity did not have a significant difference compared with the CG ($d=-0.25$; $P=.229$).	[22]
						• SS-8[e]	• EG: Decreasing stigma in the factor Stereotypes ($d=-0.70$; $P<.001$) compared with the CG.	
						• PDD[f]	• EG: No statistically significant difference in the social distance among EG and CG ($d=-0.34$; $P>.05$).	
e-Contact with a person diagnosed with schizophrenia by videoconferencing.	Cardiovascular health-related activity.	40	UGS	20.6 (1.3)	80.0	• AQ-E[g]	• EG: Decreasing total stigma level ($d=-2.33$; $P<.001$), and the factors Dangerous-Fear ($d=-1.73$; $P<.001$), Avoidance ($d=-2.32$; $P<.001$), Coercion ($d=-1.77$; $P<.001$), and Lack of Solidarity ($d=-0.83$; $P=.002$). No statistically significant difference in the CG ($P=.38$).	[11]
						• QSAS[h]	• EG: Decreasing total stigma level ($d=-1.11$; $P=.004$) and the factors Dangerousness ($d=-1.02$; $P=.007$) and Stereotypes ($d=-.83$; $P=.02$). No statistically significant differences among the CG ($P=.66$).	
Audiovisual simulation of hallucination symptoms.	Group without intervention.	244	UGS	18.62 (1.0)	62.7	• PDD	• EG: No immediate significant change and 1 week later was documented for any of 2 stigma factors evaluated ($P>.05$). No significant differences in the pre-post intervention and 1 week later among the CG ($P>.05$).	[31]
A serious videogame called Stigma-Stop.	A video game unrelated to mental health.	552	HSS[i]	15.78 (2.65)	50.0	• QSAS	• EG: Decreasing total stigma level ($d=-0.39$; $P<.001$), and the factors Dangerousness ($d=-0.66$; $P<.001$) and Stereotypes ($d=-1.36$; $P=.001$). No statistically significant differences among the CG ($P=.44$).	[36]
A serious videogame called Stigma-Stop.	A video game unrelated to mental health.	530	UGS and HSS	18.51 (4.34)	61.5	• QSAS	• EG: University students had decreasing total stigma level ($d=-0.37$; $P<.001$) and the factor Social Distance ($d=-0.65$; $P<.001$), but not the factor Stereotypes ($P=.64$).	[37]
							• EG: High-school students had reductions in total stigma level ($d=-0.50$; $P<.001$), and the factors Social Distance ($d=-0.72$; $P<.001$) and Stereotypes ($d=-0.22$; $P<.001$). No statistically significant difference among the CG ($P=.95$).	

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Experimental intervention	Control group	Sample size	Population	Mean age (SD)	Female, %	Public stigma scale	Outcome public stigma scale (EG[a] and CG[b])	Study
A videogame that uses avatars with mental illnesses.	Group watched gameplay footage.	207	UGS	20.42 (not reported)	66.7	• SDS-6[j]	• EG: Structural equation model analysis for both measures show a decrease in Social Distance (B=−0.21; $P<.05$) in the participants that played the videogame compared with the CG.	[32]
						• MIS-9[k]	• EG: The structural model did not show a significance difference in the reduction of Stereotypes (B=−.09; $P>.05$) in participants that played the videogames compared with the CG.	
A serious videogame called Stigma-Stop.	Group attendance at routine class.	118	UGS	21.17 (5.8)	81.1	• AQ-E	• EG: Videogame intervention had a significant effect on decreasing the level of Anger ($d=−0.95$; $P<.001$), Dangerousness ($d=−1.01$; $P<.05$), Fear ($d=−0.94$; $P<.001$), Segregation ($d=−0.87$; $P<.05$), Coercion ($d=−0.39$; $P<.05$), and Avoidance ($d=−1.03$; $P<.05$), and increased the level of Help ($d=−0.54$; $P<.05$). The CG had no statistically significant differences for any of the factors ($P>.05$), except for Anger ($d=−0.11$; $P<.05$).	[13]
Virtual reality implemented by video recording.	Group without intervention.	114	UGS	24.0 (6.6)	58	• SPS-6[l]	• Structural equation modeling analyses that included all participants who positively evaluated the protagonist of the video game showed significantly increased social proximity (B=0.41; $P=.002$).	[33]
Virtual reality by immersive animated story.	Virtual reality exoplanet video.	206	UGS	21.76 (5.04)	55.3	• PSA-21[m]	• EG: Decreased total stigma for the virtual reality immersive intervention ($d=−0.44$; $P=.003$) and even for 1-week follow-up ($d=−0.32$; $P=.02$) compared with the CG. In the mediation model in the virtual reality immersive intervention a decrease in the level of stigma was reported (B=−0.42; $P<.001$).	[16]

[a]EG: experimental group.

[b]CG: control group.

[c]UGS: undergraduate student.

[d]AQ-ER: Attribution Questionnaire, Emotional Response factors.

[e]SS-8: 8-item Stigmatization Scale.

[f]PDD: Perceived Devaluation and Discrimination Scale.

[g]AQ-E: Attribution Questionnaire, Spanish version.

[h]QSAS: Questionnaire on Student Attitudes toward Schizophrenia.

[i]HSS: high-school student.

[j]SDS-6: 6-item Social Distance Scale.

[k]MIS-9: 9-item Mental Illness Stereotypes.

[l]SPS-6: Social Proximity to persons with schizophrenia Scale.

[m]PSA-21: 21-item Public Stigma and Acceptance Scale.

Risk of Bias of the Included Studies

As shown in Figure 2, most of the studies included in this review were considered as having low ROB in terms of their methodological quality. However, 3 studies [31,32,37] showed a high ROB in the blinding of the participants and blinding of outcome assessment. Besides, 2 other studies [11,32] showed a high ROB related to the allocation concealment. Regarding data, 2 studies [22,37] presented incomplete data. Finally, only 1 study [31] had a high ROB in selective reporting, and no study showed a high risk of other bias or random sequence generation.

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Figure 2. Risk of bias graph: review of authors' judgments about each risk-of-bias item presented as percentages across all included studies.
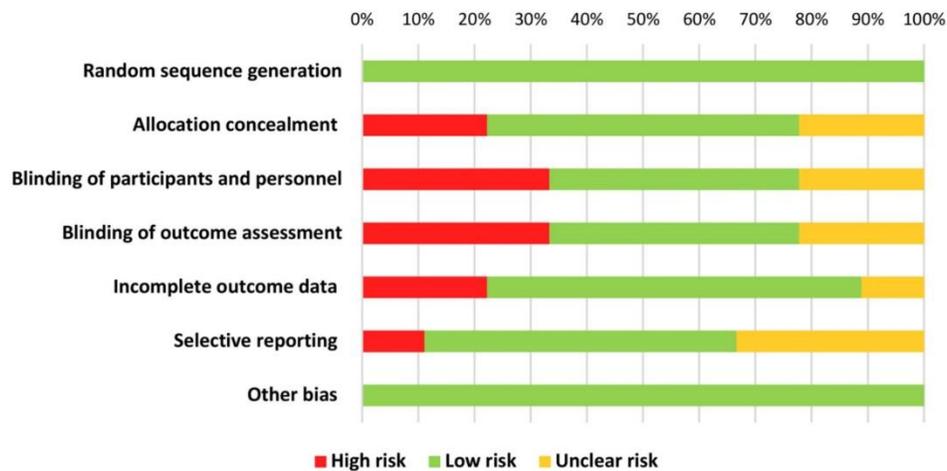
Study and Quantitative Synthesis Outcomes: Public Stigma

A total of 9 articles were included in the meta-analysis, with a total sample of 1832 participants. As shown in Figure 3, the technology-based interventions had medium effects on reducing the level of public stigma (d=–0.64; 95% CI 0.31–0.96; P<.001) compared with the control group. Only 1 study [31] that used

audiovisual simulation symptoms showed an increase in the level of stigma (P=.036; d=0.32), and another that used videogame with avatars [32] did not show any statistical effect in the level of stigma (P=.14; d=–0.18). High heterogeneity was observed among the included studies (P<.001; I^2=87.6%; Q=64.96), which was expected due to the variety of interventions.

Figure 3. Forest plot comparison of the effect on public stigma (standardized means difference) for the innovation-based intervention and control groups.

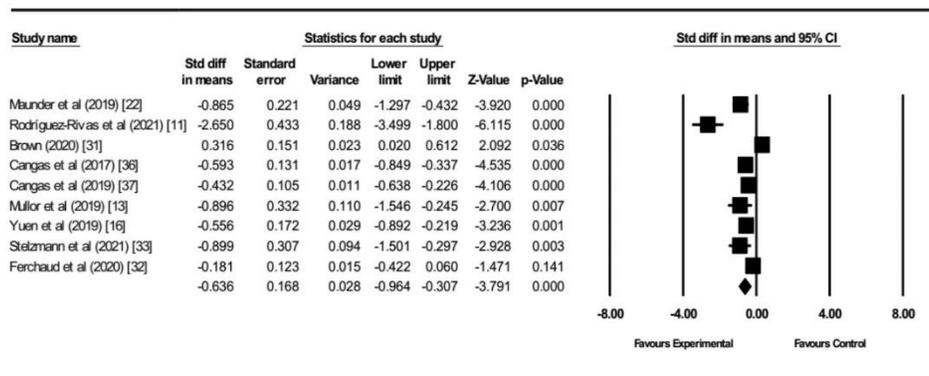| Study name	Statistics for each study							Std diff in means and 95% CI
	Std diff in means	Standard error	Variance	Lower limit	Upper limit	Z-Value	p-Value	
Maunder et al (2019) [22]	-0.865	0.221	0.049	-1.297	-0.432	-3.920	0.000	
Rodríguez-Rivas et al (2021) [11]	-2.650	0.433	0.188	-3.499	-1.800	-6.115	0.000	
Brown (2020) [31]	0.316	0.151	0.023	0.020	0.612	2.092	0.036	
Cangas et al (2017) [36]	-0.593	0.131	0.017	-0.849	-0.337	-4.535	0.000	
Cangas et al (2019) [37]	-0.432	0.105	0.011	-0.638	-0.226	-4.106	0.000	
Mullor et al (2019) [13]	-0.896	0.332	0.110	-1.546	-0.245	-2.700	0.007	
Yuen et al (2019) [16]	-0.556	0.172	0.029	-0.892	-0.219	-3.236	0.001	
Stelzmann et al (2021) [33]	-0.899	0.307	0.094	-1.501	-0.297	-2.928	0.003	
Ferchaud et al (2020) [32]	-0.181	0.123	0.015	-0.422	0.060	-1.471	0.141	
	-0.636	0.168	0.028	-0.964	-0.307	-3.791	0.000	

Publication Bias Analysis

We ran statistical analyses for publication bias [35], where Duval and Tweedie's trim-and-fill analysis identified the differences in effect sizes that could potentially be attributed to bias; the technique imputes effect sizes until the error distribution gets close to normality. In this way, the test offers the best estimate of the unbiased effect [30]. Results suggest that there were no differences in effect sizes attributable to bias.

Under a random effect model, the point estimate for the combined studies did not differ when comparing the original and the adjusted estimate (in both cases, standardized mean difference 0.63; 95% CI 0.94-0.30). Based on the parameter of Duval and Tweedie's trim-and-fill analysis, it seems that no studies are missing.

Additionally, Rosenthal's fail-safe N test is a technique for computing the number of missing studies that would be

necessary to nullify the found effect [38]. Small numbers of missing studies would reveal the likelihood of biased effects. Test was equal to 180, suggesting that it would be necessary to allocate and include 180 missing studies with no effects for every observed study to achieve the combined 2-tailed *P* value exceeding .05. Therefore, it is highly unlikely that missing studies could alter the substantive conclusion.

Discussion

Principal Findings

The results of this meta-analysis support the use of new and innovative technology–based interventions to reduce stigma toward people with mental illness.

This study shows a medium effect on stigma reduction, demonstrating a positive impact and effectiveness of these interventions. Its findings are better compared with a previous meta-analysis [39], which reported only a small effect of contact interventions for people with mental illness, and for the educative intervention, both classical and common-type interventions. This is probably due to the increasing technological development, where realism, immersion, and technological interaction are greater, becoming an increasingly natural means of communication and daily application [40].

In this regard, a recent meta-analysis showed that antistigma interventions involving contact had an immediate small-to-medium effect, and it was equivalent with diverse types of contact mediums, such as videos and presentation [41].

Another finding of our study is that the intervention that used simulation of symptoms of hallucination [31] had an increase in the level of stigma, which is concordant with a previous meta-analysis that demonstrated that it can increase social distance and negative attitudes [42]. These negative results may be explained by the focus on symptoms rather than on the recovery process, which may increase stereotypes and prejudice, especially toward people with schizophrenia. Thus, it has been suggested that it should be used with caution and ideally in combination with educational or contact interventions [43]. In this sense, it is important to consider that several research studies show that the information provided is essential to reduce stigma, where, for example, it has been helpful to refer to biographical aspects (eg, related to difficulties, personal adversities), because it allows people to empathize, understand, and generate a change in their attitudes, knowledge, and stigmatizing behaviors [44]. Therefore, the aim is not only to show "symptoms," but also to promote an understanding of these experiences and the social consequences for the people who experience them [37].

As an additional result, one of the included studies, which used videogames through avatar identification [32], despite showing no significant effect on stigma in the combined effect analysis, reported a significance effect (B=–0.21; P<.05) for the reduction of social distance, making it a tool that can be considered for future research.

Our study demonstrated the usefulness of innovative interventions in stigma reduction and summarized its latest advances, in accordance with the growing interest and need for the application of new technologies in the field of mental health in the contemporary world. These types of interventions have a variety of advantages and offer innovative solutions to everyday problems, due to their adaptability to different contexts and lower associated cost, along with the possibility of privacy in a protected environment, which allows strategies to be focused and adapted to different key population.

Furthermore, it is important to mention that while stigma is currently one of the most important problems in mental health, there are also a number of socioeconomic, cultural, and structural barriers present in society that limit access to treatment and should be considered as an integral part of reducing discrimination and inequalities in mental health.

Limitations

This study has some limitations. First, we did not include gray literature, which can increase the risk of publication bias [45]. Despite this, our statistical analysis of publication bias seems to show no missing studies, and that it is also very unlikely that a possible missing study could alter our results. Second, the small number of studies and high heterogeneity prevented us from estimating which technology-based intervention was the most effective, a limitation that may be considered in future studies as the number of publications in this emerging area increases, allowing future subgroup analyses of each type of intervention and addressing the high heterogeneity. Third, all the studies found and included focused on the population of high-school and university students, which may limit the generalizability of the results to the general population. In addition, most of the included studies did not include follow-up studies, which prevented the analysis of long-term stigma reduction.

Future Research

As stigma is a complex social phenomenon transversally present in the society [1-6], innovative interventions involving use of technologies can be an effective tool for its reduction. However, one challenge in the implementation of this type of intervention is its adaptability to different contexts and countries, and so future interventions should include cross-cultural comparison. In addition, all experimental studies involving technology-based interventions in stigma reduction focus on the young population, which represents a major challenge for future studies focused on the development, implementation, and evaluation of these types of interventions for different ages, such as adults and the elderly [46,47].

Because of the extensive evidence supporting key strategies in the development of antistigma programs, such as the educative and contact components, future research should consider and adapt them to different innovation-based interventions. Its adaptation had demonstrated a great utility, for example, in e-contact with people with mental illness, as they offer the possibility of wider dissemination and even the possibility of reaching remote areas [11,22]. New lines of work should generate greater access and development of low-cost tools with the use of new technologies that allow their use and integration in workplaces, health systems, and educational communities as a daily support tool in mental health, for example, through the

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development and use of free apps for smartphones and freeware for computers.

Finally, it is essential to generate integrated technological systems not only to reduce stigma, but also to consider preventive interventions in mental health, together with timely referrals to specialized health services and access to treatment. In this regard, we highlight the recently developed app Help Club [48], which provides the possibility of access to communities of mutual support in mental health in virtual spaces, through the use of virtual reality, demonstrating the potential and growing impact of metaverse as a space for social interaction and an increasingly used tool.

Conclusions

Our meta-analysis showed that innovative interventions involving the use of virtual reality and communication technologies are effective tools for stigma reduction toward people with mental illness and can be an alternative and a complement for the traditional methods on stigma reduction. As this field is growing and emerging, future studies present several challenges in their adaptation and dissemination in different populations and countries.

Authors' Contributions

MER-R conceived the study design. MER-R and AJC independently performed screening, selection of the included studies, and data extraction. LAC reviewed this information and resolved discrepancies. MER-R and AJC assessed the risk of bias of each study. SV, MER-R, and JJV conducted the meta-analysis. All authors contributed to the writing of the article and approved the final version.

Conflicts of Interest

None declared.

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Abbreviations

AQ-E: Attribution Questionnaire, Spanish version
AQ-ER: Attribution Questionnaire, Emotional Response factors
CG: control group
e-contact: electronic contact
EG: experimental group
HSS: high-school student
MIS-9: 9-item Mental Illness Stereotypes
PDD: Perceived Devaluation and Discrimination Scale
PRISMA: Preferred Reporting Items for Systematic Reviews and Meta-analyses
PROSPERO: Prospective Register of Systematic Reviews
PSA-21: 21-item Public Stigma and Acceptance Scale
QSAS: Questionnaire on Student Attitudes toward Schizophrenia
ROB: risk of bias
SDS-6: 6-item Social Distance Scale
SPS-6: 6-item Social Proximity to persons with schizophrenia Scale
SS-8: 8-item Stigmatization Scale
UGS: undergraduate student

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Artículo 3: Reducing stigma toward people with severe mental illness through a virtual reality intervention: a randomized controlled trial

Resumen en español

Introducción: El estigma hacia las personas con enfermedades mentales graves (EMG), como la esquizofrenia, es un grave problema de salud pública mundial que limita la calidad de vida de los afectados y supone una importante barrera que impide que las personas busquen ayuda profesional. Existe una necesidad urgente de intervenciones novedosas, eficaces y ampliables para disminuir las percepciones estigmatizadas de los trastornos psicóticos crónicos y reducir así la carga sanitaria que conllevan.

Método: Llevamos a cabo un ensayo controlado aleatorizado para evaluar el impacto de un nuevo juego de realidad virtual inmersiva (*Inclúyete-VR*) en el nivel de estigma hacia las personas con SMI, medido por el Cuestionario Atribucional (AQ-27). Los participantes en el grupo experimental fueron expuestos de forma inmersiva a alucinaciones comunes en la esquizofrenia, mostrándoseles a continuación diferentes recursos psicosociales disponibles para su recuperación e inclusión social; los del grupo de control utilizaron software de RV no relacionado con la salud mental. Las sesiones de RV se impartieron a través del casco Oculus y duraron 25 minutos.

Resultados: Asignamos aleatoriamente a 124 estudiantes universitarios (55% mujeres) a las condiciones experimental o de control (n = 62 cada una). Se utilizó un ANOVA mixto para comparar los resultados antes y después de la intervención entre los dos grupos. Encontramos una interacción significativa intervención-tiempo ($p < 0{,}001$), con una reducción en el grupo experimental de los niveles generales de estigma en la escala AQ-27 y sus tres subescalas: peligrosidad-miedo, evitación e insolidaridad ($p < 0{,}001$ para todas).

Conclusiones: El programa *Inclúyete-VR* demostró ser eficaz a corto plazo en la reducción del estigma hacia las personas con enfermedades mentales graves. Es necesario estudiar la eficacia a largo plazo, la escalabilidad y la difusión del programa.

Registro de ClinicalTrials.gov: NCT05393596

Keywords: Stigma; Virtual Reality; Mental Illness; Technology-based; Serious games; Severe Mental Disorder

Original Article

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Reducing Stigma Toward People with Serious Mental Illness Through a Virtual Reality Intervention: A Randomized Controlled Trial

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Abstract

Background: Stigma toward people with serious mental illnesses (SMI), like schizophrenia, is a serious global public health challenge that limits the quality of life of those affected and poses a major barrier that keeps people from seeking professional help. There is an urgent need for novel, effective, and scalable interventions to decrease stigmatized perceptions of chronic psychotic disorders and to reduce the health burden imposed by them.

Method: We conducted a randomized controlled trial to assess the impact of a new immersive virtual reality game (*Inclúyete-VR*) on the level of stigma toward people with SMI, measured by the Attribution questionnaire (AQ-27). Participants in the experimental group were exposed in an immersive way to hallucinations common in schizophrenia, then shown different psychosocial resources available for their recovery and social inclusion; those in the control group used VR software unrelated to mental health. VR sessions were delivered through Oculus headgear and lasted 25 minutes.

Results: We randomly assigned 124 university students (55% female) to experimental or control conditions ($n = 62$ each). We used mixed ANOVA to compare outcomes before and after the intervention between the two groups. We found a significant intervention-by-time interaction ($P < 0.001$), with a reduction in the experimental group of overall stigma levels on the AQ-27 scale and its three subscales: dangerousness-fear, avoidance, and lack of solidarity ($P < 0.001$ for all).

Conclusions: The *Inclúyete-VR* software proved effective in the short term in reducing stigma toward people with severe mental illness. The program's longer-term efficacy, scalability, and dissemination remain to be studied. ***ClinicalTrials.gov Identifier:*** NCT05393596.

Keywords: Stigma, Virtual reality, Mental illness, Technology-based, Serious games, Severe mental disorder

Introduction

S TIGMA TOWARD PEOPLE with serious mental illness (SMI) represents a serious public health problem worldwide and is considered the main barrier for the inclusion and social participation of affected people.[1] Stigma has a negative im-pact on quality of life and contributes to lower life expectancy as compared with the unaffected population.[1,2] As a consequence of prejudice, discriminatory acts, and negative attitudes toward people with SMI, it is common for those affected by them to have lower self-esteem and adherence to treatment, as well as a significant reduction in social network supports.[3,4]

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The compounded effects of stigma pose a major barrier for those with SMI to achieve full social inclusion and interfere with their ability to find and maintain employment, continue or complete studies, achieve technical or professional goals, have adequate housing, and contribute to an increased risk of suicide.[5,6] Societal discrimination, prejudice, and stereotypes affect the recovery process, quality of life, and wellbeing of people with SMI and their families. They also represent the main gap toward accessing mental health services for the general population, leading to a delay in diagnosis and lower adherence to specialized treatment.[7,8]

High levels of stigma are not only present in the general population, but also documented in university students and mental health professionals, which has been explained by the possible influence of limited knowledge about mental illness, along with cultural and media issues.[9,10] The latter finding is notable, as it affects the level of quality of care provided, especially toward people with severe and highly stigmatized mental disorders, such as schizophrenia and bipolar disorder.[11,12] Innovative and effective interventions among university students to reduce stigmatization of those with SMI have the potential to promote an inclusive and recovery-based mental health approach in future professionals.[11,13]

Technology-based interventions to reduce stigma

Given the high levels of stigmatization present in society, several initiatives have been carried out worldwide focused on its reduction. Initiatives that provide direct contact with people with SMI are effective interventions, especially when aimed strategically, as to professional and student groups.[14,15] Direct social contact and interaction allow participants to share reflections and experiences around mental health, which have proven key to the success of these programs.[16]

Adaptation of interactive interventions for implementation in virtual learning spaces is a more recent development, which has been particularly well suited for university students.[10,17] Several international programs using technology-based interventions have been implemented, each seeking to reduce SMI-related stigma.[17,18] Two recent meta-analyses have shown the efficacy of interventions involving the use of technologies in reducing SMI-related stigma.[19,20] Innovative interventions using new technologies include the use of educational videogames[21–23] and e-contact with other mental health users.[10,18,24,25] These approaches promote skill development and provide tools to promote inclusiveness.[17]

The uptake and effectiveness of technology-based approaches can be explained by their degree of interaction in an educational and immersive environment that favors learning and the change of attitudes and beliefs.[26] Indeed, the application of virtual and immersive reality in educational and mental health environments is becoming increasingly frequent.[27] For example, through the creation of 360° interactive virtual spaces, the impact of interventions has been demonstrated at a cognitive and emotional level, which can generate attitudinal and behavioral change through education, the promotion of empathy, and the reduction of explicit and implicit biases.[28] The efficacy of immersive and interactive virtual reality (VR) programs has been demonstrated in different clinical areas of mental health, including anxiety, depression, psychosis, and addictions.[29]

Thus, immersive VR incorporates simulated and interactive virtual scenarios in 3D, which allows users to experience and understand in first person different experiences, at the same time that allows interaction with various socio-emotional and educational resources, which has proven to be a promising tool to promote the development of empathy and attitude change.[28,29] However, still lacking are experimental studies evaluating such programs in reducing stigma toward people with SMI.

In this experimental study we sought to evaluate the effect of an immersive VR program (*Inclúyete-VR*) on the stigma levels of healthy volunteer university students toward people with SMI. We hypothesized that participants in the experimental group would have significantly lower levels of post-intervention standardized stigma scores when compared with participants in the control group.

Methods

Participants

The sample consisted of healthy volunteer students in the Universidad del Desarrollo, Chile. Students were recruited through a nonprobabilistic convenience sampling technique, through direct invitation to participate in the study by the research team in common spaces within the university, such as the library. The inclusion criteria were: (1) age 18 years or older; (2) matriculated as an undergraduate or graduate student; and (3) signing the informed consent form. Using G*Power software, we calculated a minimum sample size of 54 participating students per arm to find the required statistical power,[30] considering a statistical power of 80%, an alpha error of 0.05, and a medium effect size based on previous meta-analyses.[19,20]

The study was approved by the Ethical Scientific Committee of the Facultad de Medicina—Clínica Alemana Universidad del Desarrollo, Chile (ID 2022-43) and was registered in ClinicalTrials.org before the start of data collection (ID: NCT05393596). Data collection was performed confidentially; only the principal investigator had access to the encrypted and deidentified information. Participants did not receive any direct benefit from being in the research study.

Outcome instruments

Sociodemographic variables. Participants' background characteristics included the variables of age, gender (female, male, and nonbinary), and the university career to which they belonged.

Attribution questionnaire-27. This instrument has been widely used to measure levels of stigma toward people with mental illness in the general population.[31] It presents a vignette of a case of a person diagnosed with schizophrenia, where various stereotypes and prejudices are assessed and measured. For this study, we used the 14-item brief version, adapted and validated into Spanish by Saavedra et al.,[32] who obtained a four-factor structure:

- Dangerousness-fear: It assesses the public stigma related to the attribution of dangerousness to people with serious mental illness and the fear and anger caused by them (e.g., "Harry would terrify me").

- Lack of solidarity: It includes items related to lack of empathy and lack of help for people with severe mental illness (e.g., ''How likely is it that you would help Harry?'').
- Coercion: It evaluates behaviors toward people with severe mental disorders, such as institutionalization and forced medicalization (e.g., ''I think it would be best for Harry's community if he were put away in a psychiatric hospital'').
- Avoidance (Reverse score): This evaluates flight, escape or avoidance behaviors toward people with severe mental illness (e.g., '' If I were a landlord, I probably would rent an apartment to Harry'').

This instrument uses a 9-point Likert-type response scale, where higher scores represent higher levels of stigma. In the current study sample, the instrument showed adequate reliability (assessed using Cronbach's alpha) in the total score (0.89), and in its four factors (dangerousness-fear = 0.92, lack of solidarity = 0.84, coercion = 0.87, and avoidance = 0.82).

The full version of the Attribution questionnaire (AQ-27) and the abbreviated 14-item version are available as Supplementary Data S1.

VR intervention

Inclúyete-VR. *Inclúyete* (''Get Involved'') is a VR program designed in Spain to reduce stigma toward people with SMI, through an experiential and educational experience that favors empathy toward people affected by them. For the development of this program, several mental health users and professionals actively collaborated in the design and selection of scenarios and interactions within the software. The complete description of *Inclúyete-VR*, as well as images of its various levels, are available online at: https://incluyete.blog/incluyete-vr.

The software first provides a brief simulation of common hallucinations in schizophrenia, through which the player is intended to live an experience similar to that of a person suffering from an SMI and the psychological distress that this entails (e.g., feeling of anguish). Next, as shown in Figure 1, players find themselves in a ''crisis center,'' in which they must advance and overcome six interactive stages, each showing different psychosocial resources available for recovery and social inclusion (such as sports, work, artistic activities, etc.). *Inclúyete-VR* seeks to place the participant in a virtual world that shows how stigma toward
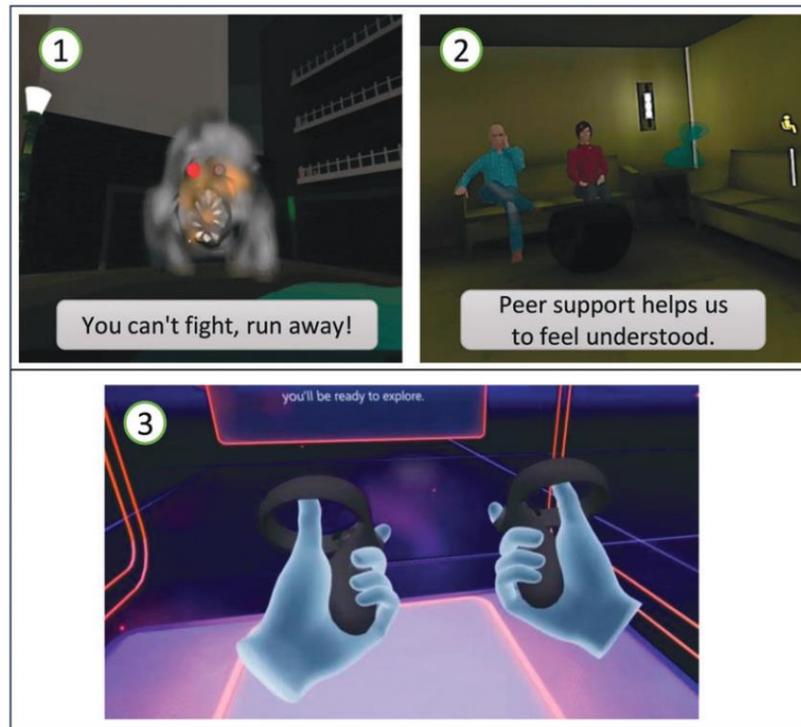
FIG. 1. Screenshots of the virtual environment of *Inclúyete*-VR (1 and 2) and the control group Welcome software (3). (1) Brief simulation of hallucinations: Several monsters approach the player, who can eliminate them by shooting them, but finally a monster appears that cannot be eliminated with the phrase ''You can't fight, run away!''; (2) Crisis center: Two people comment to the player that they have also experienced situations similar to his and that they can help him, they also inform the player that there are several rooms where can perform different activities. Then the following sentence is noted ''Peer support helps us to feel understood.'' (3) Playful interfaces and instructions for Oculus Quest 2®. Color images are available online.

people with SMI is experienced, and also to offer alternatives for rehabilitation and social inclusion, thus giving a less biased view of contemporary mental health treatment.

Welcome software (First Step Oculus). We used this program with participants in the control group. It presents a similarly interactive virtual environment, but one that is not related to mental health, where several playful interfaces and instructions for the Oculus Quest 2® VR headset are presented (Fig. 1).

VR delivery. After signing the informed consent, participants were randomized and assigned in equal parts to the experimental or control conditions, which was performed by the blocked randomization method using the Research Randomizer Software®. The experimental procedure was conducted in the Realitec-UDD laboratory, and the intervention delivered through Oculus Quest 2 VR headsets. The intervention was conducted individually and facilitated by research team staff trained in the use of both software, who provided general instructions and familiarization on the use of the VR controllers and headsets (e.g., basic functions and a general contextualization of each scenario). At the same time, the entire intervention of the virtual scenario was transmitted on a screen of the research team, to follow up and resolve doubts during its application.

In both groups, stigma levels were measured immediately before and after the intervention by accessing the online questionnaire through their smartphones. The procedure lasted between 20 and 30 minutes per participant, with similar duration between the control and experimental groups.

Statistical analyses

We used Student's t-test for independent samples to compare the means of preintervention stigma levels between the control and experimental groups. Next, we used two-way mixed model ANOVA to compare stigma levels across time points (pre- and postintervention) and intervention (Inclúyete-VR vs. control), and to evaluate the interaction effect between time and intervention. We used the Greenhouse–Geisser univariate test[33] to report significance on the main and interaction effects. We used the Bonferroni post hoc adjustment to account for multiple contrasts. We conducted all data analyses using SPSS® version 27.

Results

The study sample consisted of 124 university students from Santiago, Chile, who were between 18 and 35 years of age ($M=21.9$, $SD=2.5$). There were more female participants ($n=69$, 55.6%) than male ($n=54$, 43.5%); one participant did not identify within the gender binary. Students belonged to a health care field (e.g., dentistry, medicine, nursing; 29%), to psychology (29%), or to engineering (23%). The rest (19%) pursued careers such as architecture, law, political science, or graphic design, among others.

Regarding these variables, no significant differences were observed between the control and experimental groups with respect to age [$t_{(122)}=0.72$, $P=0.472$] nor gender [$F_{(1,\ 122)}=1.51$, $P=0.222$].

We summarize descriptive statistics for the pre/post stigma measure and its four dimensions of interest in Table 1. Of note, we found no statistically significant differences at baseline in any of the measures between the control and experimental groups.

For the total stigma score on the 14-item Attribution Questionnaire, we found a significant main effect of time ($F_{1,\ 122}=6.45$, $P=0.01$, $\eta^2=0.05$) and group ($F_{1,\ 122}=6.15$, $P=0.01$, $\eta^2=0.05$). Figure 2a displays the significant time-by-intervention interaction ($F_{1,\ 122}=13.29$, $P<0.001$, $\eta^2=0.10$). Specifically, mean differences are found between pre- and postintervention in the experimental group ($P<0.001$), but not in the control group ($P=0.436$).

The time-by-intervention interaction was significant across three of the Questionnaire's four component dimensions: (1) Dangerousness-fear (main effect of time: $F_{1,\ 122}=8.51$, $P<0.01$, $\eta^2=0.07$ and group ($F_{1,\ 122}=13.69$, $P<0.001$, $\eta^2=0.10$), time-by-intervention interaction: $F_{1,\ 122}=18.56$, $P<0.001$, $\eta^2=0.13$, Fig. 2b), where mean differences are found between pre- and postintervention in the experimental group ($P<0.001$), but not in the control group ($P=0.327$); (2) Lack of solidarity (main effect of time: $F_{1,\ 122}=8.03$, $P<0.01$, $\eta^2=0.06$ and group $F_{1,\ 122}=0.13$, $P=0.723$, $\eta^2=0.001$, time-by-intervention interaction: $F_{1,\ 122}=16.89$, $P<0.001$, $\eta^2=0.12$, Fig. 2c), where mean differences are found between pre- and postintervention in the experimental group ($P<0.001$), but not in the control group ($P=0.369$); and 3) Avoidance (main effect of time: $F_{1,\ 122}=5.33$, $P=0.02$, $\eta^2=0.04$ and group $F_{1,\ 122}=0.42$, $P=0.52$, $\eta^2=0.05$, time-by-intervention interaction: $F_{1,\ 122}=11.30$, $P=0.001$, $\eta^2=0.09$, Fig. 2d), where mean differences are found between pre- and postintervention in the experimental group ($P<0.001$), but not in the control group ($P=0.458$).

By contrast, we found no statistically significant differences in the time-by-intervention interaction of Coercion dimension [$F_{(1,\ 122)}=2.14$, $P=0.15$, $\eta^2=0.02$] nor main effect of time [$F_{(1,\ 122)}=1.30$, $P=0.26$, $\eta^2=0.01$], but we found a main effect of group: [$F_{(1,\ 122)}=6.64$, $P=0.01$, $\eta^2=0.05$; Fig. 2e].

TABLE 1. BASELINE AND PRE-POST MEAN ON
THE 14-ITEM ATTRIBUTION QUESTIONNAIRE

Variable	Control, n=62		Experimental, n=62		Statistic (df=122)	
	M	SD	M	SD	t	p
Dangerousness-fear						
Pre	4.17	1.94	3.56	1.59	1.92	0.06
Post	4.34	2.07	2.69	1.69		
Lack of solidarity						
Pre	3.16	1.30	3.54	1.30	−1.66	0.10
Post	3.30	1.63	2.75	1.38		
Coercion						
Pre	4.24	2.19	3.59	1.64	1.86	0.07
Post	4.29	2.31	3.20	1.96		
Avoidance						
Pre	3.82	1.62	4.07	1.86	0.81	0.42
Post	3.95	1.72	3.32	2.07		
Total stigma						
Pre	3.85	1.39	3.69	1.20	0.66	0.51
Post	3.97	1.62	2.99	1.44		
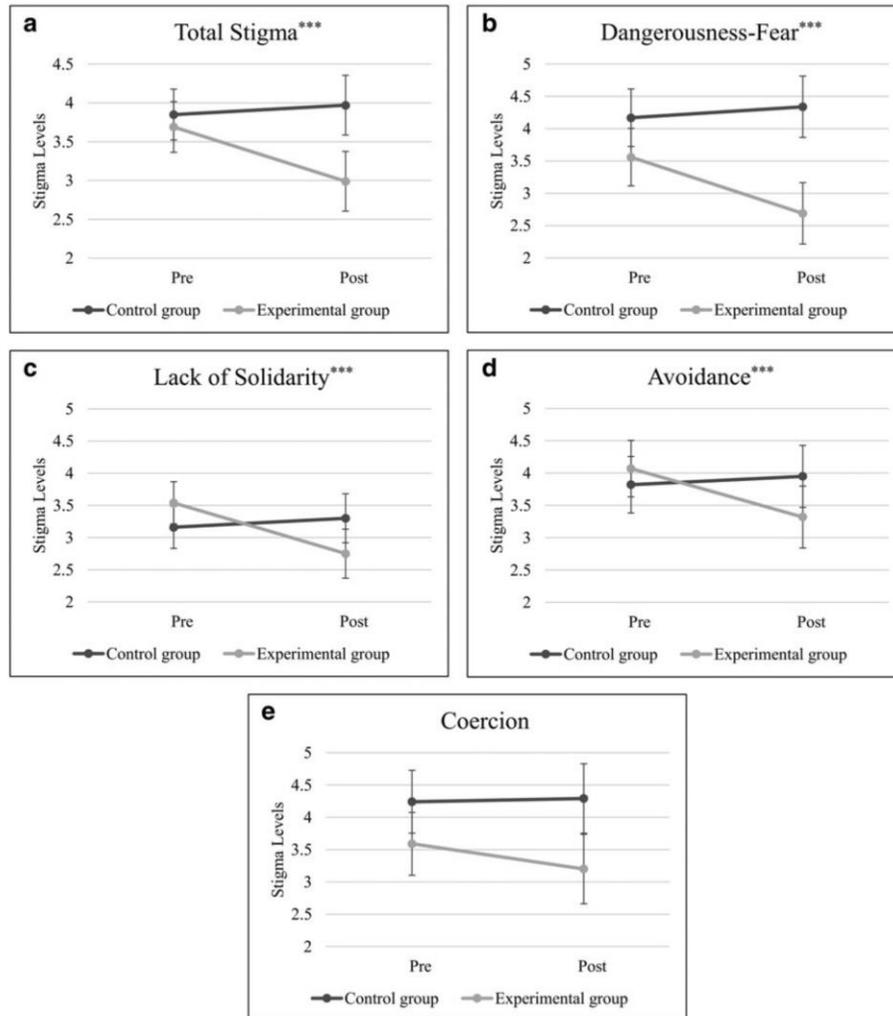
FIG. 2. Attributions Questionnaire: marginal means across time and intervention. (**a**) total stigma; (**b**) dangerousness-fear; (**c**) lack of solidarity; (**d**) avoidance; (**e**) coercion. (***$P < 0.001$ for time-by-intervention interaction; Stigma level ranges from 1 to 9 points).

Discussion

This study provides preliminary support for the *Inclúyete-VR* software as a useful tool to reduce stigma among university students toward people with SMI. Our findings are consistent with a growing international evidence base for the clinical use of new electronic technologies, ranging from videogames to online escape rooms.[21,23] Indeed, the integration of an educational component in an immersive VR environment can promote change at the cognitive and emotional levels.[17,34,35]

Regarding the baseline levels of stigma assessed with the AQ-27 instrument in the present study ($M = 3.77$), these were slightly higher than in studies conducted in university populations in Chile[25] ($M = 3.69$) and Spain[23] ($M = 3.54$).

Previous meta-analysis has noted that simulation of auditory hallucination can *increase* stigma levels.[20,36] Specifically, two studies[37,38] that applied a 16-minute hallucination simulation showed that these interventions increased social distance, coercive attitudes, and negative emotions, along with a decreased willingness to help and interact with people with mental health problems. This may

be explained by the lack of an educational component and adequate contextualization to the participants of these interventions; however, more studies are still needed to determine a dose–response relationship of the time of exposure to hallucinations that does not generate an increase in stigma. Within the *Inclúyete*-VR software, hallucinations are incorporated only briefly at the beginning, followed by educational and psychosocial components that are integrated to allow players to empathize, understand, and generate change in their stigmatized attitudes, beliefs, and behaviors. This represents a fundamental innovation in this field, as it incorporates the recommendations by several authors in relation to the use of simulation of hallucination symptoms, integrated instead with educational elements so as to not reify itemized and discriminatory views.[39,40]

Despite our positive results, the dimension of coercion did not change significantly with the intervention. The coercion factor, is understood as the belief and acceptance of forced measures toward people with mental health problems (e.g., forcing people to participate in the administration of medicines and treatments), especially when these are focused on people with SMI and psychotic symptoms.[41] Thus, the lack of effect on coercion in our study can be explained by the fact that this is a complex component to modify as it interacts at different cognitive, emotional, and cultural levels, associated with the lack of availability and knowledge of alternative treatment and noncoercive measures in mental health care.[41] Additionally, although the hallucination component was brief in the *Inclúyete*-VR software, previous studies[37,38] have shown that the use of simulation with hallucinations has an effect of increasing stigma levels, especially coercive attitudes to force treatment in people with mental illness, so this component potentially could have interacted with the intervention and explained the lack of significant change in levels of coercion in our study.

New technologies constitute a dynamic novel resource for social change. As an alternative tool, they can complement efforts at stigma reduction around people with mental health problems. Since this area is of recent development in psychology and mental health, its implementation presents challenges for adaptation, dissemination, and scalability especially considering the cost in the development and application of virtual immersive software. Future adaptations of the software will benefit from incorporating participatory components of communities of users and key players and stakeholders in its implementation, including students and experts with experience in mental health, efforts that have proven critical to the success and sustainability of antistigma programs.[15,42]

We were deliberate in our choice of students as study participants, given the relevance and need for implementation at early stages of professional development, as well as in educational and community contexts that favor dissemination among the general population and university students.[10,15,17] VR, game-based interventions represent an opportunity for the future integration of similar programs into university curricula at the national and international levels.

We recognize several limitations. First, our sample was relatively small and derived from a single educational institution, limiting generalizability to other populations. Replication through multicenter collaborative efforts could be the next step. Second, we did not collect follow-up measurements on stigma levels; future studies should assess sustainability of the effects of the VR program. Third, in our study only one stigma measurement instrument was used, and because stigma is a complex construct, future research should assess the effect on other cognitive, emotional, and behavioral components of the construct (e.g., by measuring implicit stigma). Fourth, our study did not include within the design and analysis mediating variables of the mechanisms of interaction, perception, and behavior in the VR environment that can affect and explain the effects of the intervention, such as the degree of immersion and sense of presence[43] nor the sequence and time of interaction with the virtual environments,[44] so future studies should include these variables. Finally, we did not account for the specific characteristics of the participants.

Factors that could influence results, such as sociocultural origin, level of knowledge of mental health, or the presence of personal or family mental health problems, are aspects that need to be incorporated in future research.

Despite these limitations, the *Inclúyete*-VR software proved to be effective in the short term in reducing stigma toward people with mental health problems. Future research on intervention that incorporate VR in an immersive way should address long-term efficacy and scalability, as well as design and implementation enhancements of new versions that incorporate technological advances in this area.

Authors' Contributions

M.E.R.-R.: Conceptualization, Methodology, Formal analysis, Investigation, Resources, Data Curation, Project administration, Supervision, Visualization, and Writing—Original Draft. A.J.C.: Conceptualization, Methodology, Software, and Writing—Original Draft. A.M.: Conceptualization, Methodology, and Writing—Review and Editing. J.R.: Formal analysis and Visualization. J.C.P.: Validation, Formal analysis, and Visualization. S.V.: Validation and Writing—Review and Editing. L.C.: Writing—Review and Editing. J.O.: Investigation and Resources. B.H.: Investigation and Resources. F.C.: Software and Validation; P.C.: Validation. P.C.: Conceptualization and Writing—Review and Editing.

Data Availability

The datasets generated and analyzed during the current study are available from the corresponding author on reasonable request.

Author Disclosure Statement

The research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Funding Information

Supplementary Material

Supplementary Data S1

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Conclusiones generales

CONCLUSIONES GENERALES

A través de la presente tesis doctoral se planteó el objetivo de diseñar, implementar y evaluar el efecto de intervenciones con el uso de intervenciones tecnológicas en la reducción del estigma en estudiantes universitarios hacia las personas con trastorno mental grave. Al respecto se lograron implementar de forma experimental y controlada dos intervenciones tecnológicas innovadoras a nivel nacional y mundial, con resultados favorables en la reducción del estigma esta población. Además, se logró sistematizar y evaluar meta-analíticamente el efecto de estas intervenciones en los últimos 5 años a nivel mundial.

Los resultados fueron publicados en 3 revistas científicas de alto impacto.

A continuación, se profundiza sobre el logro de cada objetivo específico planteado a partir de los resultados:

En relación con el objetivo específico 1 "diseñar, implementar y evaluar el efecto de un programa piloto multicomponente en línea en la reducción de estigma hacia las personas con trastorno mental grave en estudiantes universitarios", se concluye como resultado a través del estudio 1, que esta fue una intervención con un efecto favorable en la reducción del estigma en esta población. Además, el diseño e implementación de este tipo de intervenciones y espacios educativos enfocados a disminuir el estigma hacia los pacientes con problemas de salud mental contribuyen a normalizar estas experiencias entre la población, al compartir abiertamente los desafíos en torno a la salud mental y promover la búsqueda efectiva de ayuda y la entrega de un tratamiento adecuado a quienes lo necesitan, lo que también puede complementar la implementación de los programas presenciales existentes. Este estudio representó además a la primera investigación experimental multicomponente realizado completamente en línea a nivel nacional e internacional.

Respecto al objetivo 2, este tipo foco en evaluar la eficacia de las intervenciones innovadoras basadas en la tecnología para reducir el estigma hacia las personas con problemas de salud mental y sistematizar los estudios experimentales que utilizan este tipo de intervenciones. Al respecto, como resultados del estudio 2 se evidenció que existe una diversidad de intervenciones innovadoras basados en tecnología, evaluadas experimentalmente a nivel mundial, a través del uso de la realidad virtual, videojuegos, simulación de síntomas de alucinaciones y contacto electrónico (e-contact). Además, el meta-análisis realizado, pionero a nivel mundial, demostró que las intervenciones innovadoras que implican el uso de tecnologías son herramientas eficaces para la reducción del estigma hacia las personas con problemas de salud mental y pueden ser una alternativa y un complemento para los métodos tradicionales de reducción del estigma. Adicionalmente, se concluye que al ser este un campo emergente y en crecimiento, se requiere un mayor número de estudios experimentales, los que presentan además diversos retos en su adaptación y diseminación en diferentes poblaciones y países.

Respecto al objetivo 3 "Implementar y evaluar el efecto de un programa de realidad virtual inmersiva (Inclúyete-VR) sobre los niveles de estigma de estudiantes universitarios hacia las personas con trastorno mental grave", se concluye a través de los resultados del estudio 3 que este programa demostró ser eficaz para reducir la estigmatización de las personas con problemas de salud mental. Se concluye, además, que las futuras investigaciones sobre intervenciones que incorporen la realidad virtual inmersiva deberán abordar la eficacia y la escalabilidad a largo plazo, así como las mejoras en el diseño y la aplicación de nuevas versiones que incorporen los avances tecnológicos en este ámbito.

Al lograr con éxito la implementación de programas innovadores y publicar los resultados en revistas científicas de alto impacto, a través de la presente tesis

doctoral, es posible concluir globalmente que las intervenciones innovadoras basadas en la tecnología son una herramienta eficaz que en la reducción del estigma hacia las personas con problemas de salud mental. Además, se incluyó de forma pionera el primer estudio experimental de una intervención multicomponente completamente en línea, además de incluir al primer meta-análisis enfocado específicamente en las intervenciones tecnológicas en la reducción del estigma en salud mental, representando un avance sustancial y pionero no solo en Chile, sino que además a nivel internacional.

Futuras investigaciones

Cómo desafíos futuros de las investigaciones en este campo se encuentran el incluir tamaños muestrales más amplios, además de la participación de diversas instituciones educativas y países, que permitan la comparación transcultural.

Otro desafío está relacionado con incluir otras medidas de medición del estigma, no solo a través del autoreporte, sino que además de instrumentos de observación, las que deberán ser evaluadas de forma longitudinal, para evaluar la sustentabilidad a largo plazo de las intervenciones tecnológicas.

Futuras investigaciones deberán incluir además modelos de medición más complejos, que incluyan variables mediadoras y moderadoras de los efectos diferenciados de las intervenciones, además de análisis de subgrupos que permitan estimar un efecto diferencial de las intervenciones en estigma de acuerdo a características y variables psicológicas, personales y sociales. Esto permitirá personalizar las intervenciones, comprendiendo mejor cómo diferentes grupos responden a las intervenciones tecnológicas y optimizando así su impacto y efectividad.

Finalmente, debido a la complejidad del estigma en salud mental, otro campo emergente que requiere mayor evidencia se relaciona con la inclusión de medidas de estigma, no solo de forma explícita, sino también mediante evaluaciones

implícitas. Esto proporcionará una visión más completa y precisa, capturando percepciones subyacentes que podrían no ser evidentes en las mediciones explícitas.

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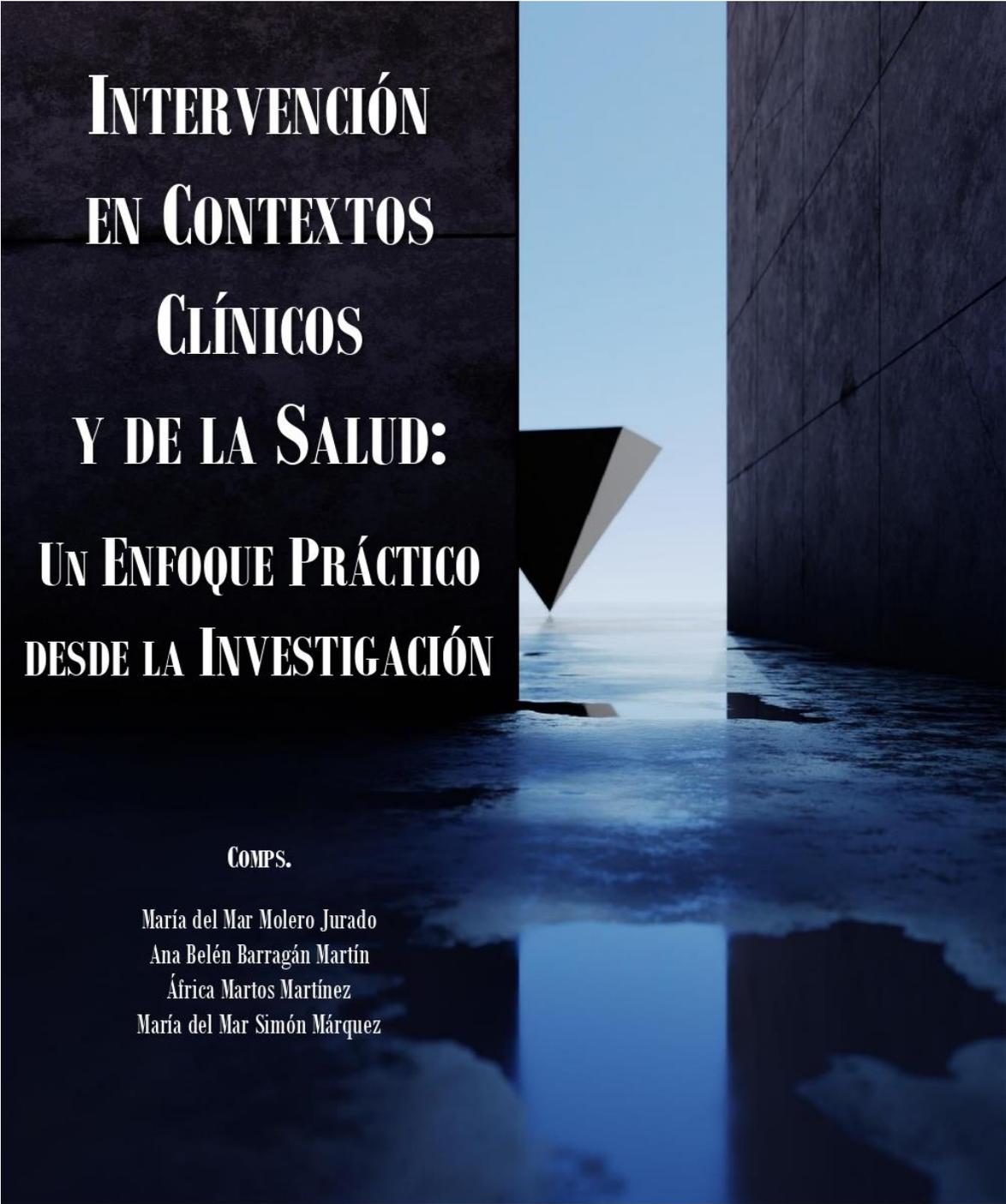
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INTERVENCIÓN EN CONTEXTOS CLÍNICOS Y DE LA SALUD:

UN ENFOQUE PRÁCTICO DESDE LA INVESTIGACIÓN

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EFECTOS DEL CONTACTO ELECTRÓNICO VÍA VIDEOCONFERENCIA EN LA REDUCCIÓN DEL ESTIGMA HACIA LAS PERSONAS CON ENFERMEDADES MENTALES

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INTRODUCCIÓN

Estigma hacia las personas con enfermedades mentales

El estigma hacia las personas con enfermedades mentales representa un grave problema de salud pública a nivel mundial y es considera la barrera principal en la inclusión social y participación de las personas afectadas, lo que posee un impacto negativo en su calidad de vida, lo que determina incluso un mayor riesgo de suicidio y mortalidad, junto con una menor esperanza de vida en comparación a la población no afectada (Carpiniello y Pinna, 2017). Es así, que la discriminación, prejuicios y estereotipos presentes en la sociedad, no solo afectan gravemente al proceso de recuperación, calidad de vida y bienestar de las personas con problemas de salud mental y sus familias, sino que representan además la principal brecha en el acceso a los servicios de salud de la población general, lo que implica un retraso en el diagnóstico y adherencia a tratamientos especializados (Corrigan 2002; Ostrow, Manderscheid, y Mojtabai, 2014).

La presencia de altas cifras de estigma también se ha observado en universitarios en formación y profesionales de la salud mental (Navarro y Triguero, 2019; Rodríguez-Rivas, 2021), lo que determina menores niveles de calidad de atención que ellos otorgan, especialmente hacia personas con trastornos mentales graves y altamente estigmatizados, como lo son la esquizofrenia y trastorno afectivo bipolar (Corrigan, 2016; Michaels, López, Rüsch, y Corrigan, 2017).

Resulta, por tanto, fundamental realizar intervenciones que disminuyan los niveles de estigmatización, enfocadas en la formación de estudiantes universitarios, donde diversas investigaciones han demostrado que intervenir a edades tempranas, determinan un mayor impacto para el fomento de una mirada inclusiva y de recuperación en salud mental de los futuros profesionales (Arens, Berger, y Lincoln, 2009; Corrigan, 2016). Lo anterior posee gran relevancia en el contexto mundial e iberoamericano, especialmente en la población juvenil, donde diversos estudios han

demostrado la presencia de las altas cifras de conductas de discriminación, estigma y prejuicios hacia la población afectada por problemas de salud mental (Rodríguez-Almagro et al., 2019).

Intervenciones realizadas a nivel internacional

Frente a los altos niveles de estigmatización presentes en la sociedad, diversas iniciativas y estudios se han realizado a nivel mundial enfocadas en su reducción, donde se ha demostrado que el contacto directo con personas con enfermedades psiquiátricas y la educación son intervenciones claves y efectivas, especialmente cuando son realizadas y enfocadas en grupos estratégicos, como lo son los profesionales y estudiantes en proceso de formación (Corrigan et al., 2014; Knaak, Modgill, y Patten, 2014). Pese a que se ha demostrado que el contacto directo y las actividades en las que los participantes y los usuarios comparten pensamientos y experiencias en torno a la salud mental son la clave del éxito de estos programas (Griffiths, Carron-Arthur, Parsons, y Reid, 2014), su implementación en espacios virtuales de aprendizaje es reciente, en particular para los estudiantes universitarios. Es así, que diversos autores han demostrado que intervenciones innovadoras con la utilización de nuevas tecnologías, como los son, el uso de videojuegos (Cangas et al., 2017), la aplicación de realidad virtual (Cangas y Galván, 2019), uso de actores simulados y e-contacto a través de medios virtuales con usuarios de salud mental (Rodríguez-Rivas et al., 2021), son herramientas eficaces en el desarrollo de diversas habilidades, herramientas y fomento de una actitud inclusiva con foco en la reducción de prejuicios y estigma hacia los individuos con trastornos mentales graves (Goh, Ow Yong, y Tam, 2021). A pesar de ello, no existen actualmente estudios que evalúen el nivel de impacto en el estigma de universitarios, que combinen de forma integrada el contacto virtual a través de videoconferencias y la interacción sincrónica con un profesional con diagnóstico de trastorno mental.

Hipótesis de estudio

Hipótesis n°1: El contacto electrónico vía videoconferencia e interacción virtual con un profesional con diagnóstico de salud mental, disminuirá los niveles de estigma en estudiantes universitarios del grupo experimental.

Hipótesis n°2: La intervención educativa vía videoconferencia no relacionada a la salud mental, no tendrá un efecto estadísticamente significativo sobre los niveles de estigma en estudiantes universitarios del grupo control.

Objetivos

Objetivo general: Evaluar el efecto de una intervención electrónico vía videoconferencia e interacción virtual sobre los niveles de estigma hacia las personas con enfermedades mentales en estudiantes universitarios.

MÉTODO

Diseño de estudio y participantes

Estudio cuantitativo y de tipo cuasiexperimental, con mediciones pre y post intervención. Los participantes fueron reclutados a través de una invitación electrónica realizada durante marzo del año 2021 en el contexto habitual de clases virtuales. La muestra final fue conformada por un total de 44 estudiantes de psicología de primer año pertenecientes a una universidad privada chilena, divididos entre los grupos control (n = 22) y experimental (n = 22). Un 75% de los participantes fueron mujeres y 25% hombres, con edades en promedio de 24 años (DE = 1.8), no observándose diferencias estadísticamente significativas en la edad entre los grupos experimental y control (p > .05).

Instrumentos

Attribution Questionnaire (AQ–27)

Este instrumento creado por Corrigan et al. (2003), ha sido ampliamente utilizado para medir los niveles de estigma hacia las personas con trastornos mentales entre la población general. En él se presenta a los participantes el caso de una persona diagnosticada con esquizofrenia y se evalúan diversos estereotipos y prejuicios a través de una escala *Likert* de 9 puntos, donde mayores puntajes representan mayores niveles de estigmatización. En el presente estudio se utilizó la versión breve de 14 ítems, validada al español por Saavedra et al. (2021), y la cual posee propiedades psicométricas adecuadas en sus cuatro factores (Peligrosidad-Miedo = .88, Evitación = .758, Coerción = .864 y Falta de Solidaridad = .837).

Procedimiento

Previo a la participación de los grupos, los participantes dieron su consentimiento informado por escrito de acuerdo con la Declaración de Helsinki y la declaración de Singapur sobre la integridad de la investigación (Resnik y Shamoo, 2011).

En primer lugar, los estudiantes de ambos grupos completaron el cuestionario atribucional *AQ-27,* a través de un formulario en línea y anónimo. Posteriormente el grupo control participó de forma habitual a través de una videoconferencia no relacionada a la salud mental. El grupo experimental participó de una actividad online de 90 minutos de duración a través de la plataforma Zoom, la cual fue implementada

por una profesional con experiencia vivida en salud mental y diagnóstico desde hace 7 años de trastorno afectivo bipolar en tratamiento. La sesión de contacto electrónico incluyó los siguientes componentes y etapas:

1. Breve presentación entre los participantes y dinámica inicial que evaluó de forma didáctica la presencia de estereotipos y prejuicios hacia las personas con enfermedades mentales. En ella se expusieron 12 imágenes numeradas de personas en diversas situaciones, expresiones faciales y condiciones, donde se les presentó una viñeta que describía un crimen violento ocurrido años atrás. Posteriormente cada uno debía elegir en base a sus observaciones y/o análisis el número correspondiente a la persona que creían culpable y exponer brevemente las razones. La mayor parte de los argumentos se atribuyeron a expresiones faciales o comportamiento observados que reconocieron como peligrosos. Posterior a ello, se les aclaró que el caso era hipotético y se discutió en profundidad el rol de los prejuicios y estereotipos sobre las conductas de evitación y miedo, especialmente las relacionadas a las personas con diagnóstico de esquizofrenia.

2. Exposición teórica-educativa sobre los componentes del estigma, las consecuencias en las personas afectadas y el rol de los futuros profesionales de la salud mental en su reducción y fomento de una mirada inclusiva.

3. El profesional expuso brevemente su propia experiencia sobre las consecuencias negativas de estigmatización en los servicios de salud, otorgando espacio para la discusión y exposición de otras experiencias negativas asociadas al estigma desde la perspectiva de los propios estudiantes.

4. Se otorgo un espacio para preguntas y reflexiones finales de los participantes sobre la experiencia y desafíos futuros en relación a la reducción del estigma.

Una vez finalizadas las actividades, los participantes de ambos grupos respondieron nuevamente el cuestionario *AQ-27* a través del formulario en línea y en concordancia con el seguimiento del código asignado.

Análisis de datos

El análisis estadístico se realizó a través del programa *SPSS 22*, con un intervalo de confianza del 95%. Se utilizó la prueba t de Student para muestras relacionadas entre las medidas previas y posteriores a la intervención en ambos grupos, con el fin de evaluar diferencias estadísticamente significativas en cada uno de ellos. Además, fue complementado con el uso de la d de Cohen para evaluar el tamaño del efecto de la intervención en cada uno de los grupos.

RESULTADOS

Como resultado, se observa que el nivel de estigma previo a la intervención es levemente superior en el grupo experimental (M= 51.7; DE= 15.3) en comparación al grupo control (M = 44.5; DE = 13.8). Además, tal como se aprecia en la Tabla 1, no existe una diferencia significativa entre los niveles de estigma previos y posterior a la intervención del grupo control en cada uno de sus factores y puntaje total ($p > .05$).

En relación al grupo experimental y tal como se muestra en la Tabla 2, se puede observar una diferencia significativa entre los niveles previos y posterior a la intervención en este grupo, concretamente posee un gran impacto al ser evaluado a través del tamaño del efecto (Lakens, 2013) , tanto en el puntaje total del estigma ($p < .000$; d = 1.93), como en los factores de peligrosidad-miedo ($p < .000$; d =1.39), evitación ($p < .000$; d =1.09), coerción ($p < .000$; d =1.36) y falta de solidaridad ($p < .000$; d = 1.90).

Tabla 1. Grupo Control: Medias y desviaciones estándar pre-test, post-test y prueba *t de Student* para muestras relacionadas en las variables del estudio

	Pre-test		Post-test		Pre-post		
Variables	M	DE	M	DE	t	p	d
AQ-27							
Peligrosidad-Miedo	17.0	6.8	17.4	6.1	-.42	.678	-.07
Evitación	9.7	5.4	9.9	5.1	-.19	.848	-.03
Coerción	9.6	3.4	9.9	3.4	-.58	.567	-.09
Falta de Solidaridad	8.2	4.1	7.9	3.9	.52	.604	.08
Total	44.5	13.8	45.2	12.7	-.28	.783	-.04

Nota. AQ-27 = Attribution Questionnaire

Tabla 2. Grupo Experimental: Medias y desviaciones estándar pre-test, post-test y prueba *t de Student* para muestras relacionadas en las variables del estudio

	Pre-test		Post-test		Pre-post		
Variables	M	DE	M	DE	t	p	d
AQ-27							
Peligrosidad-Miedo	18.3	7.7	8.3	4.1	8.79	0.000	1.39
Evitación	12.7	4.4	4.8	2.1	11.99	0.000	1.09
Coerción	116	5.0	5.6	3.1	8.61	0.000	1.36
Falta de Solidaridad	9.1	3.5	5.0	1.9	6.87	0.000	1.90
Total	51.7	15.3	23.7	9.4	12.20	0.000	1.93

Nota. AQ-27 = Attribution Questionnaire

Finalmente, la Figura 1 muestra y resume de manera gráfica los resultados en los puntajes de estigma totales pre y post intervención en cada uno de los grupos, donde

se aprecia la diferencia acentuada posterior a la implementación de contacto electrónico vía videoconferencia en el grupo experimental.

Figura 1. Niveles de estigma total pre y post intervención ambos grupos

AQ-27 Pre y Post Intervención
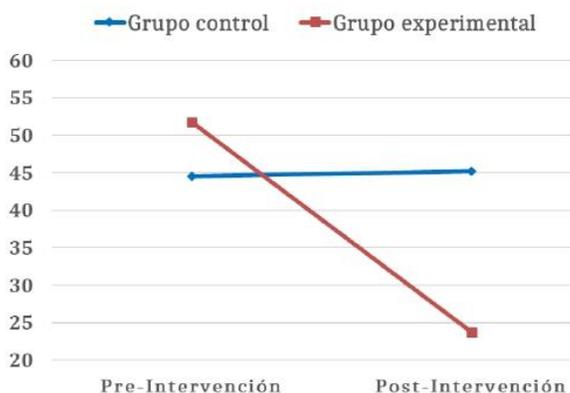
DISCUSIÓN/CONCLUSIONES

El estigma hacia las personas con enfermedades mentales es un grave problema presente en profesionales, estudiantes universitarios y sociedad general (Corrigan 2002; Ostrow et al., 2014). Nuestros resultados muestran el gran impacto y potencial que poseen intervenciones innovadoras con el uso de nuevas tecnologías en la modificación de los procesos de estigmatización y discriminación, lo que puede ser explicado por la adaptación online de los principios de la interacción y educación en la reducción del estigma y su implementación en edades tempranas de la formación profesional (Goh et al., 2021; Pokhrel y Chhetri, 2021). Nuestro estudio posee diversos aportes en la aplicación y demostración del impacto de tecnologías de contacto a distancia a través de videoconferencia sincrónica con personas con enfermedades mentales, especialmente al sumar y considerar los aportes de la intervención al ser liderada por un profesional con experiencia vivida en salud mental, lo que favorece la capacidad de educación y comprensión en primera persona de los procesos de estigmatización a diversos niveles, por lo que futuras investigaciones deben incorporar la utilización de este tipo de actores claves.

Recientes estudios han mostrado resultados similares en estudiantes en edades escolares a través de la utilización de videojuegos (Cangas et al., 2017), en grupos de estudiantes universitarios a través de intervenciones en línea multicomponente (Rodríguez-Rivas et al., 2021) e incluso la utilización de avatares de forma online en la población general (Ferchaud, Seibert, Sellers, y Escobar-Salazar, 2020), lo que da

luces sobre la utilidad del desarrollo de intervenciones digitales adaptadas a las exigencias y creciente complejidad de la sociedad del siglo XXI.

Lo anterior resulta especialmente desafiante durante el actual contexto de pandemia y distanciamiento social que ha repercutido negativamente en la capacidad de desarrollar intervenciones clásicas que incluyan el contacto directo y la educación (Pokhrel y Chhetri, 2021). Teniendo en cuenta este contexto es que nuevos estudios cualitativos explorarán la experiencia de los participantes y las lecciones aprendidas de la implementación del estudio, con el fin de adaptar y ajustar el programa y facilitar su replicación, adaptación y validación a diversos contextos culturales.

Considerando que la estigmatización es un proceso complejo, dinámico y transversal a diversas poblaciones, es que se plantean diversos desafíos a futuro en la implementación de este tipo de intervenciones, tales como la comparación del contacto con profesionales a través de conferencias virtuales y presenciales en diversos contextos de formación profesional, junto con la participación de estudiantes de diversas edades y disciplinas de estudio.

Limitaciones del estudio

Dentro de las limitaciones de nuestro estudio se encuentra la participación de estudiantes perteneciente a una sola institución educativo, por lo que futuras instancias deberán incluir diversas instituciones educativas y disciplina de formación profesional. En segundo lugar, al ser un estudio cuasi experimental no randomizado, puede limitar la generalización de los resultados, en consecuencia, nuevos estudios deberán incluir criterios de aleatorización de los participantes. En tercer lugar, no se evaluaron variables confundentes o factores sociodemográficas y culturales que puedan considerar diferencias en el impacto de las intervenciones, aspecto que es necesario que futuras investigaciones puedan incorporar.

Finalmente, y a pesar de estas limitaciones, nuestro estudio demuestra el impacto positivo de una intervención innovadora en línea en el contexto de pandemia puede generar en la disminución del estigma en estudiantes universitarios, lo cual genera aportes a la formación de competencias claves, en un futuro desempeño profesional de estos estudiantes.

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2. Artículo: Attitudes Towards People With Mental Illness Among Medical Students: A Qualitative Research

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Attitudes towards people with mental illness among medical students: A qualitative research

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ABSTRACT: Psychiatric illnesses affect more than 450 million people worldwide, with several consequences for those who are affected, along with the presence of high numbers of discrimination, stigmatization, and negative attitudes of the general population. These negative attitudes have been observed even in health professionals, negatively impacting on the quality of care, adherence to treatment and well-being of affected users. This study describes attitudes of medical students towards people with psychiatric illness from a qualitative perspective, through the analysis of thematic content of 12 semi-structured interviews conducted with first- to fourth-year medical students. Among the results, a diversity of identified attitudes outstands, including empathy, frustration, indifference and rejection, uncertainty and fear, tolerance and social acceptance. As a discussion, it is stated that most of the findings were consistent with the international literature, however there are new findings that are not described, highlighting the attitude of fear of being harmed and the rejection towards people with psychiatric pathologies. The design and implementation of educative interventions that facilitate contact with users, in order to reduce stigma and negative attitudes in future medical professionals, is concluded as an urgent challenge. Finally, it is proposed for future research to develop longitudinal and comparative studies that consider measuring the effectiveness of these interventions.
Keywords: Stigma; Undergraduate Students; Mental Health; Medical Education.

Actitudes hacia las personas con enfermedad mental en estudiantes de medicina: Un estudio

cualitativo

RESUMEN: Las enfermedades psiquiátricas afectan a más de 450 millones de personas a nivel mundial, con diversas consecuencias en quienes las padecen, junto con la presencia de altas cifras de discriminación, estigmatización y actitudes negativas de la población. Estas actitudes negativas se han observado incluso en profesionales de la salud, impactando negativamente en la calidad del cuidado, adherencia al tratamiento y bienestar de los usuarios afectados. El presente estudio describe las actitudes de estudiantes de medicina hacia las personas con enfermedades psiquiátricas desde una perspectiva cualitativa, mediante el análisis de contenido temático de 12 entrevistas semiestructuradas realizadas a estudiantes de primer a cuarto año de la carrera de medicina. Dentro de los resultados destaca una diversidad de actitudes identificadas, entre ellas, la actitud empática, frustración, indiferencia y rechazo, incertidumbre y miedo, tolerancia y aceptación social. Como discusión se plantea que gran parte de los hallazgos fueron concordantes con la literatura internacional, no obstante, existen nuevos hallazgos que no se encuentran descritos, destacando la actitud de miedo a ser dañados y el rechazo hacia los usuarios con patologías psiquiátricas. Se concluye como desafío urgente el diseño e implementación de intervenciones educativas que faciliten el contacto con usuarios, con el fin de disminuir el estigma y actitudes negativas en futuros profesionales médicos. Finalmente se plantea para futuras investigaciones el desarrollar estudios longitudinales y comparativos que midan la eficacia de estas intervenciones.
Palabras clave: Estigma; Estudiantes Universitarios; Salud Mental; Educación Médica.

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Introduction

It has been described that there are about 450 million people internationally affected by a mental or behavioral disorder, and it is the cause of more than 33% of the overall burden of diseases, which represents an increase of 18% from the year 2005 to 2015 (Pan American Health Organization, 2016). At the national level and when compared to other countries in the Americas, Chile leads in the prevalence and incidence of mental illness with 23.2% of the national population affected, which means that only in the Metropolitan Region about 2 million people have some mental pathology (Vicente et al., 2016), generating a direct, but as well an indirect impact in population's well-being and in the country's productivity (Trautmann et al., 2016).

Within the consequences associated to the presence of mental disorder, it has been described that affected people has a lower life quality and life expectancy, along with an increase of problems in physical health and premature mortality rates, since the probability of suffering a premature death increases between 40 and 60% due to health problems related to cancer, cardiovascular or communicable disease, and frequently suicide (Too et al., 2019). Those pathologies in turn are associated to high levels of discrimination and negative stigmas from the population, which leads to attitudes and behaviors that have a direct impact on affected people and in the request for professional help from the general population, causing a delay of 15 to 25 years the consultation of mental health services (Ostrow et al., 2014). In this respect, it has been described that the stigma, discrimination, and negative attitudes from the general population and healthcare professionals toward people affected by mental illness represent a stressor that reduces the life quality and the possibility of seeking a treatment, and at the same time a notoriously increase in non-compliance with therapeutic recommendations in patients affected by these pathologies (Corrigan & Watson, 2002).

Attitude towards people affected by a mental illness

An attitude is an organized predisposition to think, feel, perceive, and behave in a certain way in the presence of a referent or a cognitive object, being a steady structure of beliefs that influence someone to behave in a selective way facing attitudinal referents, in this case towards people affected by mental illnesses (Salve et al., 2013). In combination with this, the way in which perception, beliefs, opinions, and attitudes towards this people are determined to a large extent by the social group patterns of the population (Björkman et al., 2008). These patterns are mold by the socialization process, stablishing relations that promote or inhibit the value, perceptions, and particular concepts formation, which conforms as of negative values that lead to stigmatization, discrimination, and stablishing negative attitudes towards certain people or social group, including those affected by some mental pathology (Ellemers et al., 2002). Thus, the attitude and behave towards people affected by mental illness are expressed through disdain, prejudice, and discrimination (Ebrahimi et al., 2012).

Evidence shows that people affected by mental illness are one of the most vulnerable populations, since they frequently find themselves with discriminatory attitudes from general population and healthcare professionals, which tends to restrict their rights and generate inequality in the access, treatment, and results in health (Poreddi et al., 2017). As a consequence of these prejudices, discriminatory acts and attitudes towards people with psychiatric pathologies, people frequently present a low self-esteem and a lower quality of life, moreover a low treatment adherence and a significant reduction in their social networks (Corrigan et al., 2013).

It is been also observed that, usually, these people cannot access to a standardized job or educational position, in addition present difficulty to stablish friendly or couple's relationship (Howard et al., 2009). Therefore, it becomes a counterproductive phenomenon to achieve full social inclusion of

individuals with some mental disorder, in addition to interfere in the seeking and maintenance of employment, inability to continue or finish studies, achievement of technical or professional goals, possession of an adequate housing, in combination with lack of social support, low self-esteem, and increased risk of suicide (Yang et al., 2013).

These negative attitudes have been observed even in mental health professionals such as physician, psychiatrists, psychologists, and nurses (Wahl & Aroesty-Cohen, 2010). In this connection, research shows that more than 40% of people affected by a mental disorder affirm an unfair treatment at least in one occasion in health services (Funk et al., 2012), which negatively impacts in the quality of care provided by the medical team to patients affected by any disease from the mental health spectrum (Schulze, 2007).

Attitude from health professionals and students towards people affected by a mental illness

Several studies have shown that health professionals are not the exception in having a negative attitude towards people with psychiatric diseases, even those dedicated to mental health show negative attitude towards these patients (Arens et al., 2019). The attitudes and knowledges of these professionals have been indicated as the major determinants in the quality and results of the mental health care, basically, because they directly affect in the treatment, communication, resource allocation, and quality of care provided, being of lower quality on professionals with deficient attitudes and knowledges in the area (Jadhav et al., 2007).

International studies carried out on medical students show that their attitude possesses negative results towards social treatment and reinstatement of people affected by mental illness compared to nursing students (Poreddi et al., 2014). In conjunction with this, it has been seen that there are higher tolerance, benevolence, and optimism rate in medical students under 20 years old, which has been observed to decrease as age increases (Ewalds-Kvist et al., 2013). By analyzing the differences in the attitude towards people with mental pathologies, it has been seen that medical students stablish patient categories, showing less empathy towards those are affected by a psychiatric disease compared to other users (Desai & Chavda, 2018). Nevertheless, studies reveal that the students who were familiarized with people affected by mental pathologies have less restrictive and more benevolent attitudes towards this population (Anagnostopoulos & Hantzi, 2011).

On the other hand, when there is training in the knowledge and belief acquisition that improves the recognition, handling, and prevention of mental illness a reduction of these discriminatory attitudes towards people with mental disorders is generated, which in turn is associated to a minor gap in the treatment and in a better quality of life for the patients and their families (Lam et al., 2010). In a similar vein, it has been seen in health professionals a positive attitude boosted when there is experience in psychiatric services for more than a month (Hsiao et al., 2015), also presenting minor indicators of restrictive attitudes and major benevolent attitudes when a link and contact with users affected by a mental pathology are stablished (Corrigan & Wassel, 2008), particularly in those who have a family member or close friend with this diagnosis (Yuan et al., 2017), which indicates a synergic relation when there is a greater proximity towards this population (Corrigan, 2016).

As can be seen, the international evidence shows that medical students possess several attitudes towards people affected by a mental illness, which directly impacts in the quality of the cares and attention given to the patients affected by these pathologies (Stefanovics et al., 2016). This is of great importance, since these attitudes generate direct consequences in the affected people's mental health, which can lead to serious repercussions such as suicide (Campo-Arias & Herazo, 2015). This is why it is important to early know medical student's beliefs and attitudes towards these users and thus identify

possible negative perceptions and implement actions in order to reduce the stigmatization in this group and its consequences in health care user population (Buechter et al., 2013).

Methodology

Participants

The participant population was composed by 12 students from first to fourth year of the medical degree at the Universidad del Desarrollo in Santiago, Chile. 50% of the participants were women and 50% were men, all aged between 18 and 24 years old (M = 20.25; SD = 2.05).

As explained before and according to the literature review, there is a difference in respect of participant's gender and age in the attitude towards people affected by mental illness, so it was decided as sampling strategy to divide it into four dimensions. This way, 6 male students and 6 female students were interviewed, where 3 of each group were under 20 years old and 3 were over 20 years old. This was done in order to reach saturation, which is understood as the point where it has been already analyzed a certain diversity of ideas in the field of qualitative research and with each interview or further observation do not appear new elements (Suri, 2011).

Procedure

The paradigm used in this research corresponds to the constructivist, which allude to the construction of a reality according to the understanding of the participants based on their own lived experiences in their contexts and everyday life helping in the development of subjective senses as of experiences about a situation (Creswell et al., 2007). The methodological design which was carried out this research with corresponds to the denominated "Case Study", where the researcher explores one or more cases over time in order to develop a detailed description and analysis of them, so as to focalize the interest in a study phenomenon and select multiple perspectives (Suri, 2011).

The research project was evaluated and approved by the Undergraduate Research Ethics Committee of The Faculty of Medicine Universidad del Desarrollo and was conducted in accordance with the Declaration of Helsinki (General Assembly of the World Medical Association, 2014) and Singapore (Resnik & Shamoo, 2011). Moreover, the authorization of the director of Medical School, along with the authorization of the Direction of Student Affairs to carry out that research.

The way the participants were selected was through a convenience sampling, because it allows the researcher to select the desired sampling to collect the necessary information (Etikan et al., 2016).Between the months of June to September 2019 and after the informed consent was signed by the participants, the researcher proceeded to the recording and data collection of the interview using an individual script of semi-structured open questions, described below.

Instruments

In order to achieve the purposes of the research, the script of semi-structured open questions was developed and adapted for the present study from a previous instrument (Jamshed, 2014), specifically on the basis of the dimensions evaluated in the Community Attitudes Towards Mental Illness scale (CAMI) by Taylor & Dear (1981). As a result, the following open-ended questions were designed and applied during the interview:

1. What do you think about people with mental illness?
2. Would you make a difference in treating a patient with mental illness?
3. How are people with mental illness discriminated against?

4. Do you think people with mental illness are more fragile or dependent?
5. Do you think people with mental illness are dangerous or very aggressive?

Data Analysis

All the information from the semi-structured interviews was turned into written material, then its transcription process was done in order to turn reality into documentary material (Smith & Firth, 2011). The written material was analyzed through the utilization of thematic content analysis in order to identify and analyze the presence of terminology or concepts from the data gathered, which permits the creation of codes and emerging categories from the participants for every single question that was the focus of research analysis (Braun & Clarke, 2014). Software Nvivo was employed for the analysis of qualitative data, facilitating the storing, codification, and later data retrieval (Leech & Onwuegbuzie, 2011).

Results

A total of 12 semi-structured interviews were done to medical students of first- to fourth-year. Six interviews were done to women students with an average age of 20.75 years old ($SD = 2.3$) and six to male students with an average age of 19.75 years old ($SD = 1.8$). Table 1 summarizes the whole results of the study.

Table 1
Categories of attitudes towards people with mental illness among students according to year of the medical degree and gender

Dimensions	Male students	Female students
First year students	Tolerance and acceptance attitude Uncertainty and fear attitude	Indifference and rejection attitude Empathic and benevolent attitude
Second year students	Uncertainty and fear attitude	Frustration attitude Tolerance and acceptance attitude
Third year students	Frustration attitude Indifference and rejection attitude Uncertainty and fear attitude Empathic and benevolent attitude	Empathic and benevolent attitude Tolerance and acceptance attitude
Fourth year students	Tolerance and acceptance attitude Uncertainty and fear attitude	Empathic and benevolent attitude Tolerance and acceptance attitude

To proceed, the results of the research are shown according to the type of attitude present, which were determined from the emerging categories and based on the reviewed literature:

Empathic and benevolent attitude towards people affected by mental illness

It is understood as the ability of perceive, share, and understand people's feelings and emotions on the part of medical students, as well as showing affection on someone who has authority or power (Cuff et al., 2016). This is presented in a transversal way in the interviewees, and it is evident in female students of all years, being primarily mentioned the feelings that are generated towards people with mental illness and the willingness to help, as represented in the following quotes from some of the research participants:

- "Suddenly, I feel sadness because I think why should they be going through this? Ultimately, I think in how difficult is for those people to live, get things done, and anyway they are isolated from society in many aspects since people put them down". (2.1F18)
- "...from the empathy, but not for that reason make them feel worthless, but just understand what they suffer and help them when they need, but it's not about assuming they always need help, do I make myself clear?" (7.3M21)

The interviewees express empathy for the patient when they are isolated and discriminated by society in different aspects, however, this do not mean dismissing them due the fact of being affected by a mental illness.

Frustration attitude towards people affected by mental illness

It is understood as that attitude where the medical student is unable to meet the postulated needs nor the objectives, mainly in the clinical environment and case management (Neufeld & Malin, 2019). This code is present from second year and is evident on male students who possess a greater rapprochement in clinical practice as the years of the degree goes, as exemplified and detailed in the following citations:

- "With mental illness is quite different, because it's a very slow process, it's slow and exhausting for the patient as for people who treat it, there could be a relapses, stuffs beyond the disease, the context, the family, the support network that the patient has contribute in their recovery and this is frustrating because oneself want to the patient to recover and don't know what to do to get him better because it's a mental illness that it can't be fixed like a simple surgery." (9.2F20)

The interviewee comments that it is frustrating for the patient as for the professional to treat a mental illness, since different external elements take part in, such as the support network and past experiences.

- "…you have to totally handle your expressions, your movements changes, your voice changes, then you are too focused in trying to not generate problems to patient so you are going to stress out and at the same time between that you must manage to engage the patient and make him understand the treatment and if he doesn't you already have 3 problems, this adds up and even though oneself try to release that stress in emotions you must have a happy and calm face adding up until comes a point where the professional blows up". (5.3M20)

The interviewee explains that is stressful for him to adapt to clinical situation of users, in addition to focus in aspects as the understanding of indications, time management, and the attention towards patients affected by mental illness.

- "If I was doctor and comes a psychiatric patient, first I don't like the area, I would think that's so tedious, it's a lot of work, it's necessary to know about it, to classify, testing, oneself don't know a lot about the psychiatric disease, it's kind of there aren't many concrete stuff and all of this is too frustrating". (7.3M21)

For the interviewee is frustrating the work that implies dealing with patients affected by mental pathologies, along with the lack of certainty in the comprehension of these diseases.

Indifference and rejection attitude towards people affected by mental illness

This negative attitude is understood as the lack of constant attention, avoidance, or exclusion of people affected by any mental illness on the part of medical students (Kenny et al., 2018).

Although this attitude is not common in the analyzed group, it is present in both genders in 2 students of first- and fourth-year of the degree, principally alluding to rejection of dealing or working with someone affected by a mental illness, as evidence in the following citations:

- "… I don't think discrimination is wrong, I mean arbitrarily discriminate is wrong, but discrimination not, for example if I were school principal and I have an appointment with a teacher and I realized that he has (hmm) I don't know, dude, he has bipolar disorder, then is like obvious I wouldn't hire him for teacher position, because it wouldn't be sane for the students and… he must be treated". (1.1F19)

The interviewee refers to rejection towards patients with a mental illness such as bipolar disorder, for not believing that it is convenient that a person with this pathology is appropriate for working, for example, in a school.

- "… so, when we're not ready and willing to deal with it (with patients affected by mental pathologies); we immediately rather refer him to another professional and pass the problem to another professional". (5.3M20)

The interviewee refers to rejection when he says that he believes that it is preferable to refer the patient to another professional for several reasons, as not having the knowledge of how deal with it nor having the disposition to handle a patient with this type of pathology.

Uncertainty and fear attitude towards people affected by mental illness

This code is understood as the lack of conviction or certainty, anxiety sensation on the part of medical students of dealing with people affected by mental illness or handling them (Sweeney et al., 2015). This attitude is presented only in the male students every level in a transversal way, being the main alluded references to be harmed or the unpredictable behavior of the users, such as evidenced in the following citations:

- "Yes, it must be hospitalized some way, because if they compromise their ability of normally socializing, then it's necessary for their health and the people that could affect their behavior, they'd better to be hospitalize". (5.3M20)

Fear is inferred from the interviewee, since he explains that it is necessary to hospitalize a patient if its behavior affects the people around him.

- "Then it would make a difference because if the person is more susceptible to changes of tone and feels it as a more violent, thing than for a healthy person would be totally normal, obviously I have to be more careful with changes of tone, with expressions with him. Then oneself has to take precautions because it's not only a matter of helping the patient, but also of not making things worse for ourselves". (5.3M20)

The interviewee refers to fear and uncertainty in his testimony, since he explains that patients may be more susceptible to react in an unpredictable way to different attitudes of the professional, and therefore be careful with the reactions that the affected person will have.

- "They must be carefully treated anyway, because oneself doesn't know how they will react, it's like the… at least I that I don't really know hmm [sic] … oneself treats them from the ignorance, so oneself must have guard". (8.1M19)

Again, fear is inferred from the interviewee because of the reaction the patient may have in certain instances.

- "Perhaps I can't deny that I feel afraid, but it wouldn't be note, but others would be more notorious. It's like be afraid of they can do something and "PAAM!" [sic] They hit you a punch, or grip. Uhm yes, the craziest ones in a way to say it, you can see them more agitated, and it's like they invade a little bit of your personal space, I get scared". (10.4M24)

The interviewee verbalizes feeling fear, also subsequent to the patient's reaction, referring to a negative attitude by the user, which can end even in a physical aggression.

Tolerance and acceptance attitude towards people affected by mental illness

This attitude is understood when the medical student socially accepts and respects beliefs of people who are affected by a mental illness (Kim & Lee, 2018).

It is present in an evident in a transversal way to female students in all years of the degree, and only in 2 male students of first- and fourth- year, being it referred mainly to the equity in the treatment and attention, such as evidenced in the following citations:

- "…it's a super prevalent thing (mental illness), any person on your side can have one and not for this there should be a change in your attitude, a different treatment, etc. Eventually, the rules of the games are the same for everyone". (6.4M23)

The interviewee mentions that mental illnesses are not something external to daily life and the treatment must be equal towards this people.

- "… I think that we all have this… this thought that we are the responsible ones of making the patient feel comfortable and despite it has a mental illness we must offer that secure environment since it's our duty and we must treat them like normal people, because their mental illness does not identify them as a person." (9.2F20)

The citation above reflects the responsibility felt by the interviewee of looking at the patient affected by its mental illness just like any other health user, referring to the fact that disease should not be a limitation on the treatment.

Discussion

This study suggests that there is a diverse attitude towards mental illness in medical students, which is concordant with what was previously stated by studies of Stefanovics et. al (2016) at international level, where the variety of attitudes that those students can have is evidenced.

One of the main findings of the male medical students is that they have a fear and uncertainty of the harmful behavior that patients affected by psychiatric pathologies may have, being those similar to the negative attitude described on literature in general population (Martin et al., 2007). Nevertheless, the fear of being attacked it has not been described in medical students on qualitative studies at the level of literature, which is interesting to evaluate given the possible research bias in other research, and that can be explained in part by the pressure social desirability in the answers that may skew these findings (Kopera, et al., 2015).

Another present attitudes are empathy and benevolence towards these patients, which is evident on first-year students and in a transversal way to female students. This is similar to what Ewalds-Kvist et al. (2013) had described internationally in their research which shows that in the early stages of formation there is an empathic feeling and need to help on students from the medical area. In that sense, Desai & Chavda's (2018) research indicates that female students have a more empathetic attitude toward people with mental illness, which is consistent with this study's findings.

Another of the present findings on medical students was a social acceptance and tolerance attitude, in third- and fourth-year students of the degree, and particularly transversal way in female students, which is concordant with the described international literature and what was observed in the research of Poreddi et al. (2014), who mention the existence of an improvement in this attitude as students go through during the university education process, especially in women students (Pascucci et al., 2017).

A frustration attitude was also discovered on students, which is evidenced inasmuch as they present a greater clinical rapprochement towards patients with psychiatric pathologies, making reference principally to the lack of tools, pathologies comprehension, and scarce recovery of the patients affected by mental health conditions. This finding at international level it has been observed on medical students during their last years of degree, especially in male students (Pascucci et al., 2017), along with the presence of frustration associated to the non-fulfillment of the clinical objectives and also related to the lack of knowledge in deficit areas (Hill et al., 2018).

Within the less common attitudes and reported in two students, there is rejection and indifference, which is evident when one of them point to the negative of hiring people affected by psychiatric conditions. According to the proposed background at international level and in accordance with Corrigan & Watson's (2002) research, there is a similar rejection in general population, which it has been also mentioned by Schulzed et al. (2007) on research performed on professionals dedicated to mental health regarding the stigma that these patients present on the part of society. Despite this, it is particularly interesting that the rejection present in the testimonies of both medical students has not been described in the national and international literature, which contrary to this finding, states that students in the area of health present attitudes of positive characteristics towards people with mental illness in comparison with the general population (Abolfotouh et al., 2018).

Conclusions

According to the described findings, it is concluded that through the present investigation it was possible to know and to describe the attitude that the medical students of first- to fourth- year have towards people with mental illness. Among the most relevant findings were found attitudes of fear and uncertainty in the male students in a transversal way towards harmful behavior by patients with mental illnesses, where the feeling of fear of being attacked has not been described in depth at the level of the literature reviewed. The empathic and benevolent attitude is present in an evident way in the first years of the degree and especially in female students, being similar to what has been described at an international level. Another attitude described was social acceptance and tolerance and is observed with greater emphasis in third- and fourth-year medical students, and particularly in woman students, which is concordant with the literature described before. On the other hand, the frustration attitude was one of the findings described in a transversal way with a greater focus on men, which is exacerbated inasmuch as there is a greater clinical rapprochement to patients with psychiatric pathologies. Thus, among the less common attitudes is rejection and indifference, a finding not previously described in depth in the national and international literature. With regard to the knowledge deficit, there is limited literature on the attitude of medical students towards people affected by mental illnesses from a qualitative perspective, as well as little evidence in other student groups, generally focusing on professionals and the general population. In this sense, it is proposed to explore in greater depth the level of knowledge that medical students possess and the associated factors that can influence their attitude, in addition to investigating the impact on attitude and stigma generated by the development of interventions in medical students and other related disciplines.

For the health area, this study takes on vital relevance since it is intended to be a contribution, generating knowledge by allowing a greater understanding of this phenomenon, being possible to extrapolate to different areas of health, and thus to be a tool for faculty and clinical staff in the area of mental health. In that sense, the medical degree possesses a direct and stable contact with psychiatric patients, so studies in this area promote and complement further professional preparation, which in turn represents a number of challenges in the different disciplines in order to promote a positive attitude and

greater rapprochement on the part of students, professionals, and general population towards people affected by mental illnesses.

Thus, for the health area, these relevant findings should be considered in the different areas, challenging professionals in respect of multidisciplinary work, which considers carrying out promotion and prevention actions in health teams, along with the design and implementation of contact-based educative interventions that promote a decrease of negative behaviors, attitudes, and stigmas towards people affected by psychiatric diseases. This way, one of the challenges in this area is to include investigations that consider the implementation of longitudinal and comparative studies that measure the impact and efficacy of these interventions.

In addition, from this research arise inquiries such us to deeply know the process of attitude's development and behavior on medical students, the influence of familiar factors, and the process of social learning of the peer group that determine that attitude, which generates a direct impact in the results of health and life quality of people affected by mental illnesses.

Among the limitations of the study is the relatively small sample size, so it is not possible to generalize the results. Also, specific characteristics of the participants that may influence the results, such as socio-cultural factors, level of knowledge and approach to mental disorders, were not assessed.

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Anexos: Instrumentos utilizados

Attribution Questionnaires AQ-27 and AQ-14

- *Note*: The points corresponding to the abbreviated Spanish version (AQ-14) are in bold type and marked with an asterisk (*). In addition, the Spanish version items used are indicated in square brackets.

Please read the following statement about harry:

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

Now answer each of the following questions about harry.Circle the number of the best answer to each question.

1. I would feel aggravated by Harry.

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

2. I would feel unsafe around Harry.

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

3. Harry would terrify me. (*) ["José me aterraría"]

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

4. How angry would you feel at Harry?

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

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

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

6. I think Harry poses a risk to his neighbors unless he is hospitalized.
   1   **2**   **3**   **4**   **5**   **6**   **7**   **8**   **9**
none at all   very much

7. **If I were an employer, I would interview Harry for a job. (*) ["Si fuera un empresario, entrevistaría a José para un trabajo"]**

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

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

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

9. I would feel pity for Harry.

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

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

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

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

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

12. How irritated would you feel by Harry?

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

13. **How dangerous would you feel Harry is? (*) ["En tu opinión, ¿hasta qué punto es José peligroso?"]**

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

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

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

15. **I think it would be best for Harry's community if he were put away in a psychiatric hospital. (*) ["Sería mejor para la comunidad de José que lo recluyeran en un hospital psiquiátrico"]**

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

16. **I would share a car pool with Harry every day. (*) ["Compartiría el coche para ir al trabajo con José cada día"]**

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

17. **How much do you think an asylum, where Harry can be kept away from his neighbors, is the best place for him? (*) ["¿Hasta qué punto cree que un hospital psiquiátrico, donde José pudiera mantenerse alejado de sus vecinos, es el mejor lugar para él?"]**

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

18. **I would feel threatened by Harry. (*) ["Me sentiría amenazado por José"]**

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

19. **How scared of Harry would you feel? (*) ["¿Hasta qué punto José le asustaría?"]**

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

20. **How likely is it that you would help Harry? (*) ["¿Cuál es la probabilidad de que ayudara a José?"]**

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

21. **How certain would you feel that you would help Harry? (*) ["¿Con qué certeza cree que ayudaría a José?"]**

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

22. **How much sympathy would you feel for Harry? (*) ["¿Hasta qué punto comprende a José?"]**

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

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

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

24. **How frightened of Harry would you feel? (*) ["¿Hasta qué punto le aterrorizaría José?"]**

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

25. **If I were in charge of Harry's treatment, I would force him to live in a group home. (*) ["Si estuviera al cargo del tratamiento de José, le obligaría a vivir en un piso supervisado"]**

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

26. **If I were a landlord, I probably would rent an apartment to Harry. (*) ["Si fuera un propietario, probablemente alquilaría un apartamento a José"]**

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

27. How much concern would you feel for Harry?

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

Experiencia de participar en intervención educativa multicomponente

AQ-27: José es un soltero de 30 años con esquizofrenia. A veces oye voces y se altera. Vive solo en un apartamento y trabaja como empleado en una gran firma de abogados. Ha sido hospitalizado seis veces a causa de su enfermedad.
*Obligatorio

1.   3. José me aterraría. *

   Marca solo un óvalo.

	1	2	3	4	5	6	7	8	9	
No, en absoluto	◯	◯	◯	◯	◯	◯	◯	◯	◯	Muchísimo

2.   7. Si fuera un empresario, entrevistaría a José para un trabajo. *

   Marca solo un óvalo.

	1	2	3	4	5	6	7	8	9	
No es probable	◯	◯	◯	◯	◯	◯	◯	◯	◯	Muy probablemente

3.   13. En tu opinión, ¿hasta qué punto es José peligroso? *

   Marca solo un óvalo.

	1	2	3	4	5	6	7	8	9	
Nada, en absoluto	◯	◯	◯	◯	◯	◯	◯	◯	◯	Muchísimo

4.   15. Sería mejor para la comunidad de José que lo recluyeran en un hospital psiquiátrico. *

   Marca solo un óvalo.

	1	2	3	4	5	6	7	8	9	
No, en absoluto	◯	◯	◯	◯	◯	◯	◯	◯	◯	Muchísimo

5.   16. Compartiría el coche para ir al trabajo con José cada día. *

Marca solo un óvalo.

	1	2	3	4	5	6	7	8	9	
No es probable	◯	◯	◯	◯	◯	◯	◯	◯	◯	Muy probablemente

6.   17. ¿Hasta qué punto cree que un hospital psiquiátrico, donde José pudiera mantenerse alejado de sus vecinos, es el mejor lugar para él? *

Marca solo un óvalo.

	1	2	3	4	5	6	7	8	9	
Nada, en absoluto	◯	◯	◯	◯	◯	◯	◯	◯	◯	Muchísimo

7.   18. Me sentiría amenazado por José. *

Marca solo un óvalo.

	1	2	3	4	5	6	7	8	9	
No, en absoluto	◯	◯	◯	◯	◯	◯	◯	◯	◯	Si, Muchísimo

8.   19. ¿Hasta qué punto José le asustaría? *

Marca solo un óvalo.

	1	2	3	4	5	6	7	8	9	
Nada, en absoluto	◯	◯	◯	◯	◯	◯	◯	◯	◯	Muchísimo

9.   20. ¿Cuál es la probabilidad de que ayudara a José? *

Marca solo un óvalo.

	1	2	3	4	5	6	7	8	9	
Definitivamente no ayudaría	◯	◯	◯	◯	◯	◯	◯	◯	◯	Definitivamente ayudaría

10. 21. ¿Con qué certeza cree que ayudaría a José? *

Marca solo un óvalo.

	1	2	3	4	5	6	7	8	9	
Ninguna certeza	◯	◯	◯	◯	◯	◯	◯	◯	◯	Absoluta certeza

11. 22. ¿Hasta qué punto comprende a José? *

Marca solo un óvalo.

	1	2	3	4	5	6	7	8	9	
Nada, en absoluto	◯	◯	◯	◯	◯	◯	◯	◯	◯	Muchísimo

12. 24. ¿Hasta qué punto le aterrorizaría José? *

Marca solo un óvalo.

	1	2	3	4	5	6	7	8	9	
Nada, en absoluto	◯	◯	◯	◯	◯	◯	◯	◯	◯	Muchísimo

13. 25. Si estuviera al cargo del tratamiento de José, le obligaría a vivir en un piso supervisado. *

Marca solo un óvalo.

	1	2	3	4	5	6	7	8	9	
No, en absoluto	◯	◯	◯	◯	◯	◯	◯	◯	◯	Muchísimo

14. 26. Si fuera un propietario, probablemente alquilaría un apartamento a José. *

Marca solo un óvalo.

	1	2	3	4	5	6	7	8	9	
No es probable	◯	◯	◯	◯	◯	◯	◯	◯	◯	Muy probablemente

Questionnaire on Student Attitudes toward Schizophrenia (QSAS)	Todas las respuestas son anónimas y no existirá limitación de tiempo para completarlas. Solicitamos tu sincera respuesta a los ítem que te presentamos a continuación. Te rogamos que intentes señalar la respuesta inmediata ("automática") que te sugiera cada uno de los ítems. Califica tu grado de acuerdo o desacuerdo con las siguientes aseveraciones:

15. Todas las respuestas son anónimas y no existirá limitación de tiempo para completarlas. Solicitamos tu sincera respuesta a los ítem que te presentamos a continuación. Te rogamos que intentes señalar la respuesta inmediata ("automática") que te sugiera cada uno de los ítems. Califica tu grado de acuerdo o desacuerdo con las siguientes aseveraciones: *

Marca solo un óvalo por fila.

	1: Estoy de acuerdo	2: Estoy en desacuerdo	3. No estoy seguro(a)
1. Alguien con esquizofrenia no puede sobrellevar el estrés antes de los exámenes.	◯	◯	◯
2. En la mayoría de los casos, alguien con esquizofrenia viene de una familia de poco dinero.	◯	◯	◯
3. Alguien con esquizofrenia no puede ser ayudado por los médicos	◯	◯	◯
4. Cuando quedas (te reúnes) con alguien con esquizofrenia hay que andarse con cuidado.	◯	◯	◯
5. Alguien con esquizofrenia puede ser bueno en los estudios	◯	◯	◯
6. Alguien con esquizofrenia puede ponerse furioso por una tontería.	◯	◯	◯
7. Los estudiantes con esquizofrenia son particularmente buenos en música o arte.	◯	◯	◯
8. Tendría miedo de hablar con una persona con esquizofrenia.	◯	◯	◯
9. No me molestaría o preocuparía estar en la misma clase de una persona con esquizofrenia	◯	◯	◯
10. Me podría imaginar haciéndome amigo de una persona con esquizofrenia.	◯	◯	◯
11. Me sentiría avergonzado si amigos supieran que alguien de mi familia tiene esquizofrenia.	◯	◯	◯
12. Si la persona que se sienta a mi lado en clase desarrollara esquizofrenia, preferiría sentarme en otro lado.	◯	◯	◯
13. Si uno de mis amigos desarrollara esquizofrenia, iría a verlo al hospital.	◯	◯	◯
14. No invitaría a alguien con esquizofrenia a mi fiesta de cumpleaños.	◯	◯	◯

15. No llevaría a alguien con esquizofrenia cuando quedo con mis amigos.	◯	◯	◯
16. Cuando la clase se va de excursión (viaje) una persona con esquizofrenia debería quedarse en casa.	◯	◯	◯
17. Nunca me enamoraría de alguien con esquizofrenia.	◯	◯	◯
18. Alguien con esquizofrenia no debería realizar trabajos que incluyan cuidar a niños o jóvenes.	◯	◯	◯
19. Alguien con esquizofrenia no debería ir al colegio normal.	◯	◯	◯

Valoración metodología

Esta sección evalúa tu percepción de las diversas intervenciones preparadas en ambas jornadas. Es fundamental puedas responderlas para generar futuras mejoras docentes.

16. Respecto a la Metodología de Aprendizaje Basado en el Diseño de Intervención Final (Tutorías, avances y proceso de desarrollo de entrega final del proyecto): *

Marca solo un óvalo por fila.

	1	2	3	4	5
¿En qué grado crees que esta metodología puede ayudar a que los estudiantes en general tengan más interés por conocer aspectos relacionados con la salud mental?	◯	◯	◯	◯	◯
¿En qué grado consideras que esta experiencia puede ayudar a otras personas a mejorar su comprensión del proceso de recuperación en personas con problemas graves de salud mental?	◯	◯	◯	◯	◯
¿En qué grado consideras que esta experiencia ha sido educativa, en general, sobre los problemas graves de salud mental?	◯	◯	◯	◯	◯
¿En qué grado consideras que esta experiencia puede hacer a quienes participen más empáticos hacia las personas con problemas graves de salud mental?	◯	◯	◯	◯	◯
¿En qué grado consideras que esta metodología puede ser útil para favorecer la inclusión social de las personas con problemas graves de salud mental?	◯	◯	◯	◯	◯

17. Respecto a la Metodología de Aprendizaje Experiencial (Actores Simulados en Proceso de Recuperación, Taller 1 introductorio al estigma, Taller 2 Trastorno Mental Grave y conversatorios entorno a enfermedades mentales): *

Marca solo un óvalo por fila.

	1	2	3	4	5
¿En qué grado crees que esta metodología puede ayudar a que los estudiantes en general tengan más interés por conocer aspectos relacionados con la salud mental?	◯	◯	◯	◯	◯
¿En qué grado consideras que esta experiencia puede ayudar a otras personas a mejorar su comprensión del proceso de recuperación en personas con problemas graves de salud mental?	◯	◯	◯	◯	◯
¿En qué grado consideras que esta experiencia ha sido educativa, en general, sobre los problemas graves de salud mental?	◯	◯	◯	◯	◯
¿En qué grado consideras que esta experiencia puede hacer a quienes participen más empáticos hacia las personas con problemas graves de salud mental?	◯	◯	◯	◯	◯
¿En qué grado consideras que esta metodología puede ser útil para favorecer la inclusión social de las personas con problemas graves de salud mental?	◯	◯	◯	◯	◯
¿Qué nivel de inmersión o sensación de estar en un contexto real has sentido durante la experiencia?	◯	◯	◯	◯	◯
¿Cuánto de entretenido ha sido para ti estas actividades de simulación?	◯	◯	◯	◯	◯
¿Recomendarías a un amigo/a que experimente este programa de intervenciones simuladas?	◯	◯	◯	◯	◯

18. Respecto a la Metodología de Aprendizaje a través del E-Contacto con Usuario con Patología Mental Grave (Invitado Experto por Experiencia Leonardo): *

Marca solo un óvalo por fila.

	1	2	3	4	5
¿En qué grado crees que esta metodología puede ayudar a que los estudiantes en general tengan más interés por conocer aspectos relacionados con la salud mental?	○	○	○	○	○
¿En qué grado consideras que esta experiencia puede ayudar a otras personas a mejorar su comprensión del proceso de recuperación en personas con problemas graves de salud mental?	○	○	○	○	○
¿En qué grado consideras que esta experiencia ha sido educativa, en general, sobre los problemas graves de salud mental?	○	○	○	○	○
¿En qué grado consideras que esta experiencia puede hacer a quienes participen más empáticos hacia las personas con problemas graves de salud mental?	○	○	○	○	○
¿En qué grado consideras que esta metodología puede ser útil para favorecer la inclusión social de las personas con problemas graves de salud mental?	○	○	○	○	○

19. Respecto a la experiencia de integración de los 3 tipos de metodologías planteadas durante ambas jornadas (Aprendizaje Basado en Proyecto, Aprendizaje Experiencial y Aprendizaje a través del E-Contacto con Usuario con Patología Mental Grave): *

Marca solo un óvalo por fila.

	1	2	3	4	5
¿En qué grado crees que esta metodología puede ayudar a que los estudiantes en general tengan más interés por conocer aspectos relacionados con la salud mental?	◯	◯	◯	◯	◯
¿En qué grado consideras que esta experiencia puede ayudar a otras personas a mejorar su comprensión del proceso de recuperación en personas con problemas graves de salud mental?	◯	◯	◯	◯	◯
¿En qué grado consideras que esta experiencia ha sido educativa, en general, sobre los problemas graves de salud mental?	◯	◯	◯	◯	◯
¿En qué grado consideras que esta experiencia puede hacer a quienes participen más empáticos hacia las personas con problemas graves de salud mental?	◯	◯	◯	◯	◯
¿En qué grado consideras que esta metodología puede ser útil para favorecer la inclusión social de las personas con problemas graves de salud mental?	◯	◯	◯	◯	◯
¿Qué nivel de inmersión o sensación de estar en un contexto real has sentido durante la experiencia integrada??	◯	◯	◯	◯	◯
¿Cuánto de entretenido ha sido para ti estas estrategias integradas?	◯	◯	◯	◯	◯
¿Recomendarías a un amigo/ que experimente estas estrategias integradas?	◯	◯	◯	◯	◯

20. En una escala de 1 a 7 ¿De qué manera calificarías globalmente las actividades de ambas jornadas? *

Marca solo un óvalo.

	1	2	3	4	5	6	7	
Mala/muy mala	◯	◯	◯	◯	◯	◯	◯	Excelente

Supplementary Material
I. Learning Strategies Assessment Scale

1. Regarding the Project Based Learning Methodology:

	1	2	3	4	5
At what level do you think this methodology can help students in general become more interested in learning about mental health?	◯	◯	◯	◯	◯
At what level do you think this experience can help others improve their understanding of the recovery process in people with serious mental health problems?	◯	◯	◯	◯	◯
At what level do you consider this experience to have been educational, in general, about serious mental health problems?	◯	◯	◯	◯	◯
At what level do you think this experience can make those involved more empathetic towards people with serious mental health problems?	◯	◯	◯	◯	◯
At what level do you think this methodology can be useful to promote the social inclusion of people with serious mental health problems?	◯	◯	◯	◯	◯

2. Regarding Standardized patients and anti-stigma Workshops:

	1	2	3	4	5
At what level do you think this methodology can help students in general become more interested in learning about mental health?	◯	◯	◯	◯	◯
At what level do you think this experience can help others improve their understanding of the recovery process in people with serious mental health problems?	◯	◯	◯	◯	◯
At what level do you consider this experience to have been educational, in general, about serious mental health problems?	◯	◯	◯	◯	◯
At what level do you think this experience can make those involved more empathetic towards people with serious mental health problems?	◯	◯	◯	◯	◯
At what level do you think this methodology can be useful to promote the social inclusion of people with serious mental health problems?	◯	◯	◯	◯	◯
What level of immersion or feeling of being in a real context have you felt during the experience?	◯	◯	◯	◯	◯
What level of entertainment have these simulation activities been for you?	◯	◯	◯	◯	◯
Would you recommend a friend to experience this programme of simulated interventions?	◯	◯	◯	◯	◯

frontiers

3. Regarding E-Contact intervention:

	1	2	3	4	5
At what level do you think this methodology can help students in general become more interested in learning about mental health?	⬭	⬭	⬭	⬭	⬭
At what level do you think this experience can help others improve their understanding of the recovery process in people with serious mental health problems?	⬭	⬭	⬭	⬭	⬭
At what level do you consider this experience to have been educational, in general, about serious mental health problems?	⬭	⬭	⬭	⬭	⬭
At what level do you think this experience can make those involved more empathetic towards people with serious mental health problems?	⬭	⬭	⬭	⬭	⬭
At what level do you think this methodology can be useful to promote the social inclusion of people with serious mental health problems?	⬭	⬭	⬭	⬭	⬭

4. Regarding Integration of the 3 types of learning strategies:

	1	2	3	4	5
At what level do you think this methodology can help students in general become more interested in learning about mental health?	◯	◯	◯	◯	◯
At what level do you think this experience can help others improve their understanding of the recovery process in people with serious mental health problems?	◯	◯	◯	◯	◯
At what level do you consider this experience to have been educational, in general, about serious mental health problems?	◯	◯	◯	◯	◯
At what level do you think this experience can make those involved more empathetic towards people with serious mental health problems?	◯	◯	◯	◯	◯
At what level do you think this methodology can be useful to promote the social inclusion of people with serious mental health problems?	◯	◯	◯	◯	◯
What level of immersion or feeling of being in a real context have you felt during the experience?	◯	◯	◯	◯	◯
What level of entertainment have these simulation activities been for you?	◯	◯	◯	◯	◯
Would you recommend a friend/ who experiences these integrated strategies?	◯	◯	◯	◯	◯

Note: This instrument was designed specifically for the current study.