



Review Article

Online anti-stigma interventions for mental health help-seeking in young people: A systematic review

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ABSTRACT

Background: Young people (14–25 years) have the lowest tendency to seek mental health services, despite being the population with the highest prevalence of mental illness. Past help-seeking literature frequently identifies stigma as a key barrier to accessing services within this age group. As young people use the internet as their predominant source for health information, this systematic review aimed to examine the effectiveness of online anti-stigma interventions on reducing young people's self-stigma and perceived public stigma towards mental health help-seeking.

Method: A search was conducted on four electronic databases, PsycINFO, PsycARTICLES, CINAHL, and PubMed in February 2023. Eligible studies contained: (i) participants between the ages of 14 and 25 years; (ii) were conducted online and utilised anti-stigma (self-stigma and/or public) intervention methods for mental health help-seeking; (iii) assessed changes in help-seeking attitudes, intentions, or behaviours for common mental health problems of depression, anxiety, emotional distress, self-harm, or suicidal thoughts. Six studies were eligible for this review.

Results: Online anti-stigma interventions were mostly successful in reducing public stigma, and to a lesser degree self-stigma, and in improving young people's help-seeking intentions with some evidence also suggesting positive trends regarding increases in help-seeking behaviour and improved attitudes.

Limitations: Due to limited eligible studies and the heterogeneity of the research, generalisations should be made with caution.

Conclusions: This review demonstrates the need for higher quality evaluations that utilise health behaviour models and can effectively assess the interplay between relevant variables and allow for the assessment of long-term intervention effects.

1. Introduction

Mental illness is a global health burden that impacts young people who have a higher prevalence compared to any other stage of the life-cycle (Solmi et al., 2022). Approximately 20% of young people world-wide currently experience a mental health condition (World Health Organisation [WHO], 2018) with suicide the second leading cause of death in this age group (Aguirre Velasco et al., 2020). Evidence suggests that the onset for mental illness typically occurs from mid-teens to early twenties (14–25yrs; Solmi et al., 2022) with the most common diagnoses being depression and anxiety. In Australia, for example, the rate of mental illness in young people contributes to significant clinical, social, and economic burden. Thirty-nine percent of 16 to 24 year olds experienced mental illness in 2020–2021 (Australian Bureau of Statistics

[ABS], 2022) and this contributes to an annual cost of \$180 billion in terms of prevention, care, and lost productivity (Productivity Commission, 2020).

Mental illness can have an enduring impact on young people's development, affecting health and social functioning into adulthood (Allouche et al., 2021). Many countries recognise the importance of investing in mental health reforms to improve young people's access to mental health services to produce better outcomes and reduce the significant burden caused by mental illness (Henderson et al., 2013). However, mental health disorders in young people remain widespread and undertreated with reluctance to seek help frequently identified as a primary reason (Radez et al., 2021).

To improve mental health, help-seeking remains the vital first step. Mental health help-seeking is defined as an "adaptive coping process

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that is the attempt to obtain external assistance to deal with mental health concerns" (Rickwood and Thomas 2012, p. 180). Rickwood et al. (2005) model of help-seeking conceptualises a dynamic process which involves: (i) awareness of a problem, (ii) expression of symptoms and need for support, (iii) identification and accessibility to sources of help, and (iv) willingness to seek out these sources of help. This model of help-seeking is underpinned by three key processes being attitudes, intentions, and behaviours (Ajzen, 1991). Rickwood and Thomas (2012) categorise sources of help as either informal (e.g., family, friends), formal (e.g., health professionals, youth workers), or self-help (e.g., internet based).

Common barriers for mental health help-seeking for young people have been thoroughly researched (e.g., Radez et al., 2021; Aguirre Velasco et al., 2020; Gulliver et al., 2010). Findings include negative beliefs and attitudes regarding mental health professionals and services, low levels of mental health literacy, and diminished cognitive ability/limited insight along with increased rates of social exclusion and isolation (Aguirre Velasco et al., 2020). Research supports that stigma regarding mental illness is consistently identified as the dominant barrier to seeking help (Clement et al., 2015; Schnyder et al., 2017).

Corrigan and Watson (2002) describe stigma as comprising three main components: (i) stereotypes (negative beliefs regarding a social group), (ii) prejudice (unfavourable feelings towards the group) and (iii) discrimination (adverse behaviours towards group members). Research also distinguishes between self-stigma and perceived public stigma (Corrigan and Shapiro, 2010) with self-stigma referring to one's personal attitudes that serve to stigmatise their help-seeking (e.g., "seeking help means I'm weak"), and perceived public stigma referring to one's concerns about how other's may negatively perceive their choice to seek help (e.g., "I would be seen as weak") (Corrigan and Shapiro, 2010).

Both self-stigma and perceived public stigma are key barriers that adversely impact help-seeking intentions and behaviours (Schnyder et al., 2017). In an analysis of the factor structure of a stigma scale, Yap et al. (2014) results indicated that young people had stronger negative perceived stigma compared to self-stigma. Studies have also found that certain demographic variables are predictive of stigma, with differential results for self and perceived stigma. For example, greater self-stigma was found among males compared to females (Calear et al., 2010), while females scored higher on perceived public stigma (Calear et al., 2010). Familiarity with mental health issues is a further predictor, with Aguirre Velasco et al. (2020) reporting that for young people, higher levels of contact with those experiencing anxiety or depression, and knowledge of these conditions, significantly predicted self-stigma but not perceived public stigma. Such findings of different relationships support the importance of separately assessing both self-stigma and perceived public stigma. Schnyder et al., (2017) systematic review indicated a negative association between both perceived public stigma and self-stigma with active help-seeking behaviour, whereas Eisenberg et al. (2009) found that past help-seeking behaviour amongst university students was only associated with self-stigma. While many studies have explored the relationship between stigma and help-seeking, this has predominantly focused on adult populations (e.g., Boerema et al., 2016; Waqas et al., 2020) with more research needed in the adolescent/young adult population (Clement et al., 2015; Gulliver et al., 2010).

Effective intervention strategies to promote mental health help-seeking in young people are essential for prevention, early detection, treatment and recovery (Hom et al., 2015). Past reviews focusing on the effectiveness of anti-stigma interventions (Corrigan et al., 2012; Griffiths et al., 2014) noted their effectiveness in improving participant attitudes (e.g., reducing stereotypes), knowledge of mental health conditions, (e.g., improved awareness of symptoms) and ability to reduce stigma via educational in-person approaches. However, over the past twenty years, young people have demonstrated a strong dependence and preference for the internet as their main source of health information (Pretorius et al., 2019). Examples include low-intensity self-directed services such as ReachOut, informative resources (e.g., Black dog Institute), online

therapy (e.g., headspace) and structured self-directed apps (e.g., MoodGym). Despite the internet's utility for delivering online interventions, only one prior review (Goh et al., 2021) has examined the effectiveness of anti-stigma interventions within an online modality. That review reported significant reductions in public stigma compared to in-person approaches, however, this was completed with an adult population. No existing reviews have examined the effectiveness of online anti-stigma interventions in younger populations.

Important advantages of online interventions include their accessibility, decreased reliance on geographic proximity to services, and their ability to reduce the possible risk of stigma involved with seeking mental health treatment (Peynenburg et al., 2020). Moreover, the potential in utilising the internet to facilitate mental health help-seeking with young people is becoming increasingly evident (Davies et al., 2014; Ebert et al., 2017). For example, students report that information accessed on the internet has significant influence on their own self-care, as well as preferences for self-help due to an increased sense of independence and perceptions of self-reliance (Peynenburg et al., 2020).

Help-seeking is the integral health action for improving mental health within young people. An empirical assessment of the effects of online interventions for reducing stigma towards mental health conditions with young people could potentially assist in promoting help-seeking as this appeals to young people's preference for self-directed and anonymous participation.

1.1. Aims

The reviewed literature supports that anti-stigma interventions are effective in increasing mental health literacy and improving attitudes towards mental health problems. However, to the best of our knowledge, no previous systematic review has examined the effectiveness of online anti-stigma interventions on reducing young people's self-stigma and perceived public stigma towards mental health help-seeking. The current review aims to address this gap by systematically examining the current state of research regarding the effectiveness of online anti-stigma intervention strategies on modifying young people's stigma, attitudes, intentions, and behaviour towards mental health help-seeking.

2. Method

2.1. Search strategy

This review was registered on PROSPERO and is reported in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Page et al., 2021) to ensure methodological rigour of the review (Tam et al., 2019). Four electronic databases, PsycINFO, PsycARTICLES, CINAHL, and PubMed were searched without time restriction until February 2023. The search terms as well as the inclusion and exclusion criteria were developed using the PICO structure and expanded using Medical Subject Heading (MeSH) terms and Boolean operators. Following broad preliminary search concepts, terms were refined to ensure accurate retrieval of relevant studies, with help sought from an experienced librarian. The search included the following keyword combinations: "Help-seeking OR Help Seeking AND Mental Health AND Young People AND Stigma AND Intervention AND Internet OR Online OR Web" (further details described in Appendix A). These key words were selected to target online interventions which promote help-seeking in young people and include stigma as an outcome. Search limits included peer reviewed articles only and published in English language journals. No limit regarding year of publication was included. Reference lists of relevant studies were also manually screened.

2.2. Eligibility

PICO guidelines were used for the systematic review:

Population: Eligible studies reported results for participants between the ages of 14 to 25 years. Young people were defined as persons aged between 14 and 25 years as this age range captures lifecycle challenges and experiences which could be reflected in help-seeking behaviours and intentions (Solmi et al., 2022).

Intervention: Online anti-stigma interventions for improving mental health help-seeking behaviours, intentions or attitudes.

Comparator: Studies with an active comparator (other online interventions or face-to-face), no comparator, or a passive comparator were included.

Outcomes: Primary: Help-seeking attitudes, intentions, and behaviours for common mental health problems of depression, anxiety, emotional distress, self-harm, or suicidal thoughts. Secondary outcomes include examining any differences between age, sex, and location (e.g., rural, regional, or urban), increases in mental health literacy and satisfaction with treatment.

For this review, help-seeking was defined as actively seeking help for mental health concerns in a formal (GP or mental health professional), informal (family or friends), or self-help (mental health apps) manner (Divin et al., 2018). Most study designs were considered, including feasibility studies, case-studies, observational studies, and quasi experimental studies.

Studies that referred to young people over the age of 25 or adolescents under 14 years old were excluded. Where study populations consisted of young people outside of this age range, the paper was included if separate outcome data was provided for 14–25 year olds. Other exclusion criteria were non-primary empirical research such as editorials or commentaries, articles published in languages other than English, or interventions that did not focus on internet delivered, anti-stigma related help-seeking interventions or not related to the mental health conditions described in inclusion criteria.

Eligibility assessment at titles and abstract phase was conducted by one author. At a second stage, a second independent reviewer screened full texts to assess eligibility.

2.3. Data extraction

Data from the selected studies were extracted using the following strategy: 1st author, year of publication, country, sample size, study design, sample characteristics (age, sex and location) key study inclusion and exclusion criteria, description of intervention, comparison group, primary outcome, outcome measures, results and effect size (if reported).

2.4. Quality assessment

The quality assessment of the included articles was conducted by one author using the Joanna Briggs Institute Critical Appraisal Checklists (Joanna Briggs Institute [JBI], 2020), as per design of included studies. This process was verified by a second author. The JBI is a previously validated quality assessment tool that utilises a checklist format to evaluate the quality of each study design (Pluye, 2013), and particularly appropriate in lieu of the variety of included study designs. Checklists used in the current review include the random controlled trials (RCTs; Tufanaru et al., 2020), cross-sectional (Moola et al., 2020), and quasi-experimental (Tufanaru et al., 2020) study checklists (Appendix B). Exclusion based on overall study quality was not applied due to the limited studies available and the review seeking a thorough overview of the effectiveness of online anti-stigma interventions for help-seeking in young people.

3. Results

The search retrieved 634 studies from the databases and via manual review of reference lists. Following removal of duplicates and title and abstract review, 13 studies underwent full text review. Following full

text review, six articles were included in the review (see Fig. 1).

3.1. Characteristics of included studies

Six publications met the inclusion criteria (Total $N = 2299$). The sample sizes ranged from 32 to 1552: median 166.5, mean 383 (SD=534). Participant ages ranged from 14 to 25 years: median 19.5, mean 19.38 (SD= 2.34). There was a high proportion of females in the studies, ranging from 47% to 76%: median 68.95%, mean 66.65% (SD=10.56%). Four were randomised controlled trials (RCTs) (Davies et al., 2018; Howard et al., 2018; Stanley et al., 2018; Taylor-Rodgers et al., 2014), one cross-sectional observational study (Collins et al., 2011), and one quasi experimental study (Shandley et al., 2010). Due to the small number of eligible studies identified and the heterogeneity of the research, a meta-analysis could not be conducted.

The included studies were published from 2010 to 2018: four were conducted in Australia (Collins et al., 2011; Howard et al., 2018; Shandley et al., 2010 and Taylor-Rodgers et al., 2014), one in the USA (Stanley et al., 2018) and one in the UK (Davies et al., 2018). The studies were conducted in metropolitan settings ($n = 3$) and mixed settings (urban and regional) ($n = 3$). The studies were conducted in secondary schools ($n = 1$), university settings ($n = 3$) and with users of online services ($n = 2$). Within these settings, one study targeted young people with a DSM-5 psychiatric disorder who denied receiving mental health treatment within the past year (Stanley et al., 2018); two studies explored young people with mild to moderate mental health problems (Collins et al., 2011; Shandley et al., 2010); the remaining three studies were inclusive of all young people regardless of mental health status. The study characteristics are presented in Table 1.

3.2. Intervention characteristics and modes of delivery

Intervention delivery included researcher-led ($n = 3$) and self-directed, low intensity online mental health support ($n = 3$). Intervention sessions consisted of one session ($n = 2$), three sessions ($n = 1$) and participant self-paced sessions ($n = 3$). Duration for whole programs included one session ($n = 2$), three weeks ($n = 2$) four weeks ($n = 1$), and six weeks ($n = 1$). Session duration varied from 15 min to 60 min. A range of strategies were employed to deliver stigma reduction interventions including online information sites, self-directed learning modules, chat groups, forums, a web-based mental health educational game, case vignettes and implicit cognitive re-training techniques. No authors mentioned using a health behaviour model in developing interventions. However, a few studies included Cognitive Behaviour Theory (CBT; Beck, 2005) and the Cognitive Bias Modification (CBM; Macleod, 2012) paradigm to develop their interventions (Collins et al., 2011; Shandley et al., 2010; Stanley et al., 2018).

3.3. Psychoeducation/Multimodal stigma reduction interventions

Most interventions were multimodal and included psychoeducation which was delivered via a variety of techniques and mostly focused on aetiological models of mental illness and different attributes of psychiatric disorders including epidemiological factors, clinical features, course of illness, and treatment options. Modes of delivery included a web-based mental health educational game based on CBT (Collins et al., 2011; Shandley et al., 2010), online informational programs/factsheets (Collins et al., 2011; Howard et al., 2018; Shandley et al., 2010 and Stanley et al., 2018), a quiz to assess information comprehension (Stanley et al., 2018), self-directed learning modules (Taylor-Rodgers et al., 2014) and structured training modules (Davies et al., 2018). Additionally, one study designed a novel intervention based on CBM principles (Macleod, 2012) to implicitly retrain participants to hold positive associations towards mental health help-seeking (Stanley et al., 2018).

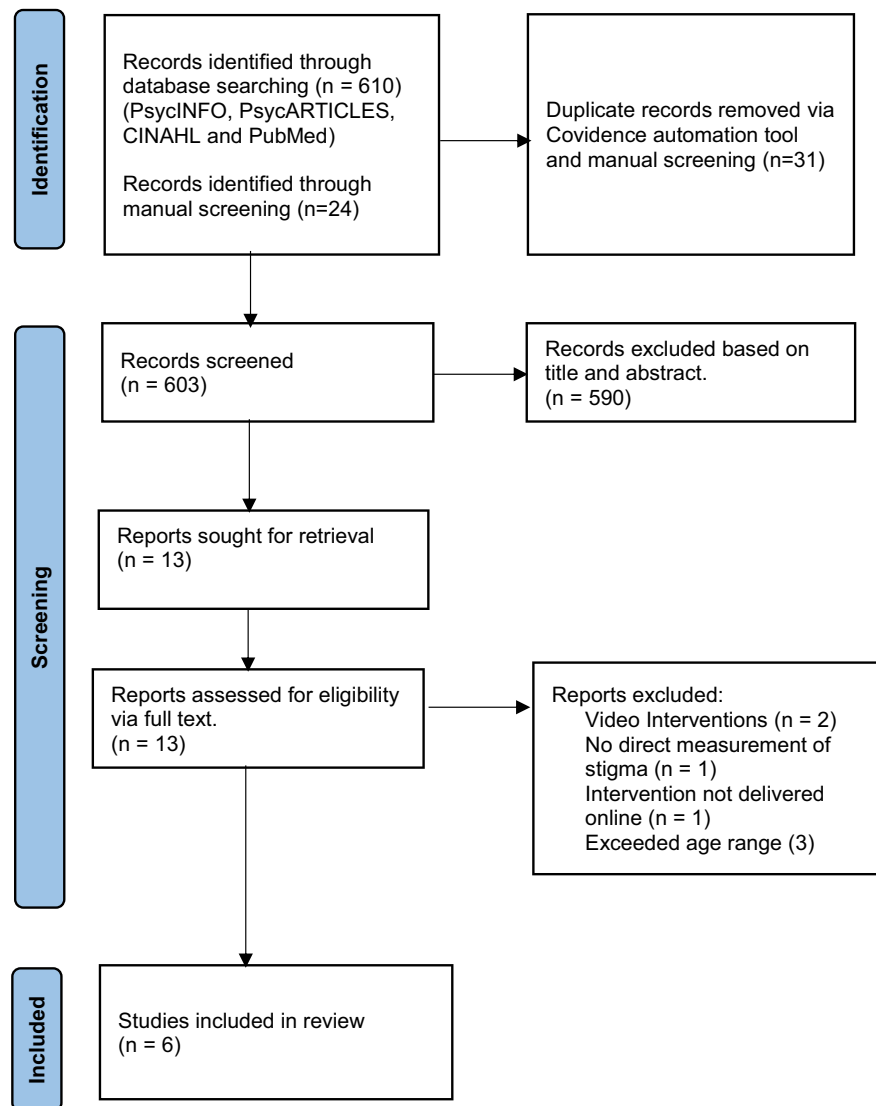


Fig. 1. PRISMA Flowchart.

3.4. Study quality

Most measures for stigma and help-seeking were inconsistent and relied on self-reporting, with four studies unclear on whether these outcomes were measured in a valid and reliable way (see Appendix B). Regarding the four RCTs, the quality of the studies varied, with most demonstrating evidence of bias in terms of the percentage of positive responses to questions within the JBI checklist. Most commonly, studies were limited in relation to blinding of participants, administrators, and outcome assessors. In two RCTs it is unclear if the groups were similar at baseline. Also, while each RCT included follow-up, attrition rates were high with short follow up periods (≤ 2 months).

The cross-sectional and quasi-experimental study designs also demonstrated mixed quality. The cross-sectional study lacked clear inclusion and exclusion criteria and consideration of potential confounds. For the quasi-experimental study, its open trial methodology impacts the plausible assessment of true study effectiveness and time/maturation effects. Moreover, no control group was included, further affecting causal plausibility (see Appendix B).

3.5. Primary outcomes: stigma

All studies focused on reducing young people's stigma towards

mental health help-seeking, however, only five studies included stigma as a primary outcome, including four RCTs (Davies et al., 2018; Howard et al., 2018; Stanley et al., 2018; Taylor-Rodgers et al., 2014) and one cross sectional study (Collins et al., 2011). Only two studies differentiated between changes in self-stigma and perceived public stigma (Howard et al., 2018; Stanley et al., 2018). Three RCTs including structured training modules, self-directed psychoeducation and implicit bias retraining techniques reported significant stigma reduction within the experimental conditions (Davies et al., 2018; Taylor-Rodgers et al., 2014 and Stanley et al., 2018). Specifically, Stanley et al. (2018) found a significant reduction in both the psychoeducation and CBM conditions for help-seeking self-stigma and perceived public stigma at two month follow-up. This indicated a large effect with 18.8% of participants achieving significant change, and two thirds belonging to the CBM condition. One RCT using a single session (45 min) psychoeducation intervention reported no significant effect, however an overall decrease in anticipated self-stigma and perceived public stigma post intervention occurred in both the experimental and control conditions (Howard et al., 2018).

Regarding the Reach Out Central studies, Collins et al. (2011) found that while 84% of users reported possessing more understanding about mental health issues, fewer (particularly if reporting high levels of distress) felt the program had helped them "worry less about what

Table 1
Selected characteristics of included studies.

Author, Country	Sample Characteristics	Study Design	Intervention	Control	Duration	Stigma Outcome measures (self, public)	Help seeking outcome measures: Attitudes, Intentions, Behaviour	Results
Collin et al. (2011); Australia	1552 young people (14–25 years) (76% female), users of ReachOut website	Cross sectional survey following engagement with ReachOut website	Online services ability to aide HS process via support & engagement	Nil	1 session (20 min total)	Single question for public stigma: “Would you socialise with someone who has a MH issue.”	Single HSI question. E.g., “How likely to participate in particular activities.” Single HSB question. E.g., “When asked if ROC had helped them ask a professional for help.”	<i>Stigma:</i> 85.6% reported “probably” or “definitely” would. <i>HSI:</i> Stronger intention to seek help via informal (friends) (62.4%) and online sources (66.7%) then formal sources (MH services). <i>HSB:</i> 35.2% reported “quite a bit” or “a lot.”
Davies et al. (2018); United Kingdom (UK)	55 UK medical students who participated in MHFA elearning course (mean age: 19.9) (65% female)	RCT (Pilot)	MHFA eLearning course	No access control group	6 weeks self-paced	Personal stigma subscale from the DSS	HSI: Responses coded using a scoring scheme based on the MHFA action plan	<i>Stigma:</i> Stigma significantly reduced in the intervention group, $Z = -2.30$, $P = 0.021$, but not in controls, $Z = -0.748$, $P = 0.45$. <i>HSI:</i> Increased in the intervention group ($Z = 3.07$, $p = 0.002$), but not in the control ($p = 0.09$).
Howard et al. (2018); Australia	327 secondary school students (16–19 years) (47% female)	RCT	Online educational conditions to increase HS for depression: 1) Biological information 2) Psychosocial information.	Neutral information condition	1 session (45 min total)	SSDS and DSS	HSI: GHSQ	<i>Stigma:</i> No significant results for biological or psychosocial in reducing anticipated self-stigma or personal stigma for depression. <i>HSI:</i> Small increase for depression found for biological information.
Shandley et al. (2010); Australia	266 young people (mean age = 20.5) (66% female).	Single group Quasi Experimental repeated measures	Online game to increase coping strategies, MHL, HS intentions and reduce stigma	Nil	4 weeks, self-paced with a 2mth follow-up.	Two questions for public stigma: “How willing would you be to (i) make friends and (ii) work with someone they knew was depressed.”	Single HSI question. E.g., “How likely they would be to seek help from a health professional if they felt sad, down or miserable for more than two weeks.”	<i>Stigma:</i> Females were significantly more willing to make friends with a person who is depressed than males at post program and follow-up. No significant differences reported for (ii). <i>HSI:</i> Significant increase pre-post-intervention across participants, although an interaction effect showed this was significantly greater for females.
Stanley et al. (2018); United States (US)	32 undergraduate students with mental health disorder(s) who denied past treatment (mean age = 21 years) (71.9% female).	RCT (pilot)	Online CBM-HS	Psychoeducation	Three intervention sessions delivered in one week intervals (45 mins total), included a two-month follow-up.	SSOSH, PS	HSI: Adapted Readiness to Change Scale. HSB: Adapted SAMHSA’s National Survey on Drug Use and Health.	<i>Stigma:</i> Across groups, significant reduction in HS self-stigma ($F [2,214,66.418] = 5.057$, $p = 0.007$, $\eta p^2 = 0.144$) and perceived public stigma ($F [3,901] = 6.614$, $p < 0.001$, ηp^2)

(continued on next page)

Table 1 (continued)

Author, Country	Sample Characteristics	Study Design	Intervention	Control	Duration	Stigma Outcome measures (self, public)	Help seeking outcome measures: Attitudes, Intentions, Behaviour	Results
Taylor-Rodgers et al. (2014); Australia	67 young people (mean age = 21.9) (74% female).	RCT	Online psychoeducation for depression, anxiety and suicide stigma.	Online attention matched control information (e.g., dental hygiene, nutrition).	3 weeks self-paced.	DSS, GASS, SOSS-SF.	HSA and HSI: ATSPPH-SF and GHSQ	2 = 0.181) from baseline to 2mth follow-up. HSI: No significant differences across time points. HSB: At 2mth follow-up, 25% of participants initiated MH treatment (29.4% CBM-HS, 20.0% psychoeducation). Stigma: Significant between-group differences for decreased depression stigma in intervention group ($d = 0.53$). HSA/HSI: Significant increased HSA and HSI for intervention group ($d = 0.58$ and $d = 0.53$, respectively).

Nil: zero, HS: Help seeking, MH: mental health, RCT: randomised controlled trial, MHFA: mental health first aid, HSI: help seeking intention, HSB: help seeking behaviour, HSA: help seeking attitude, DSS: Depression Stigma Scale; SSDS: Self-Stigma for Depression Scale, GHSQ: General Help-seeking.

Questionnaire, MHL: mental health literacy, CBM-HS: cognitive bias modification-help seeking, SSOSH: Self-Stigma of Seeking Help, PS: Perceived Stigma and Barriers to Care for Psychological Problems Scale, SAMHSA: Substance Abuse and Mental Health Services Administration, GASS: Generalised Anxiety Stigma Scale, SOSS-SF: Stigma of Suicide Scale short form, ATSPPH-SF: Attitudes Toward Seeking Professional Psychological Help short form.

people think about the problems associated with mental health issues.” Additionally, users also reported that they “probably” or “definitely” would (85.6%) befriend or socialise with someone who had a mental health, substance, or alcohol use problem. The quasi experimental study examined stigma as a secondary outcome (Shandley et al., 2010) and reported only finding a significant difference between males and females post program, with females being more willing to make friends with a person who was depressed. Collectively, these findings suggest that online interventions can produce significant stigma reductions compared to control conditions, with small ($d = 0.25$; Davies et al., 2018), moderate ($d = 0.53$; Taylor-Rodgers et al., 2014) and large effect sizes reported ($d = 0.80$; Stanley et al., 2018).

3.6. Help-Seeking

Intervention effects on the following help-seeking outcomes were examined: attitudes, intentions, and behaviours. Despite each study including at least one of these variables, none reported on all three outcomes. Help-seeking intentions were assessed in all six studies, while help-seeking attitude and help-seeking behaviour were only assessed in two separate studies respectively. Additionally, help-seeking was a primary outcome in only four studies, three of which were RCTs (Davies et al., 2018; Stanley et al., 2018; Taylor-Rodgers et al., 2014) and one was cross sectional (Collins et al., 2011), and a secondary outcome of two studies (Shandley et al., 2010; Howard et al., 2018).

In measuring changes in attitude, Taylor-Rodgers et al. (2014) evaluated a brief online psychoeducational intervention for increasing positive attitudes towards help-seeking for depression, anxiety, and suicide stigma. A significant between group interaction was reported indicating a positive shift in attitudes towards help-seeking within the experimental condition relative to the active control condition.

Stanley et al. (2018) reported positive trends and durability of effects regarding help-seeking behaviour at two-month follow-up (25% of participants had initiated mental health treatment), however this change was not significant.

Three RCTs, all of which utilised psychoeducation based interventions reported significant increases in help-seeking intentions for accessing formal services (Davies et al., 2018; Taylor-Rodgers et al., 2014). Howard et al. (2018) found an overall increase in help-seeking intentions at post-test in all three conditions and a small, but significant between group difference for the biological information regarding mental health condition relative to the control and psychosocial information condition. Stanley et al. (2018) reported no significant differences regarding intention between conditions. With Collin's et al. (2011) cross-sectional study, only a minority of users reported the online service facilitating an increase in their help-seeking intentions (35.2%) with a strong preference remaining for informal sources. Shandley's et al. (2010) quasi-experimental study found a significant increase in willingness to seek help, however, this change was recorded via a 10 point Likert scale, with the post-test means suggesting overall low to medium scores. Together, these findings indicate a significant increase in help-seeking intentions with some evidence also suggesting positive trends regarding increases in help-seeking behaviour (Stanley et al., 2018) and improved attitudes (Taylor-Rodgers et al., 2014).

3.7. Secondary outcomes: demographics

Demographic information concerning age, years at school and location were not all individually captured in each reviewed study, but where included, no significant differences were reported for each of these outcomes. Additionally, most studies did not report any significant gender differences except for the quasi-experimental study (Shandley

et al., 2010) which found, (i) females had significant higher levels of psychological distress post-intervention as measured on the Kessler Psychological Distress Scale (K10; Kessler et al., 2002), (ii) significant gender difference regarding stigma reduction, with females being more willing to make friends with a person who is depressed, and (iii) that males were more likely to seek out informal sources, whereas females were more open to a combined intervention approach (both formal and informal).

3.8. Knowledge of mental health literacy

Four studies reported findings on mental health literacy as an outcome, with two RCTs finding significant increases (Davis et al., 2018; Taylor-Rodgers et al., 2014). Davies et al. (2018) reported a significant increase across the general mental health literacy (MHL) content assessed via a true or false quiz pre and post intervention. However, Taylor-Rodgers et al. (2014), reported only finding a significant increase in MHL for the anxiety and depression literature and not suicide.

Although MHL was not directly assessed in Howard et al. (2018) the relationship between reduced stigma and an intervention focused on increasing MHL was not found to mediate increased help-seeking intentions. Collins et al. (2011) cross-sectional study reported a positive increase in MHL, with 84% of participants self-reporting a greater understanding of mental health issues. However, the quasi-experimental study (Shandley et al., 2010) did not report any changes in MHL, with baseline results already high, although a significant difference between genders at each time point was found. Studies which showed significant improvement in participants MHL also demonstrated the highest levels of intervention drop-out. Overall, most studies found young people's recognition and effective management of mental health issues was strongly influenced by their levels of MHL in-hand with decreased levels of stigma.

3.9. Satisfaction with treatment

Four studies included measures for assessing young people's experience and satisfaction with the online interventions. Studies enquired about motivation for participating (Davies et al., 2018), providing ratings on how helpful the service was (Collins et al., 2011), how easy it was to use (Davies et al., 2018; Shandley et al., 2010), whether they would use it again (Collins et al., 2011; Shandley et al., 2010), whether they would recommend it to others (Davies et al., 2018; Shandley et al., 2010), and how satisfied were they with the intervention (Taylor-Rodgers et al., 2014). No standard measure was used to assess this outcome making responses difficult to compare. Each study used between two and six questions designed by the authors, with satisfaction shown to be generally high for each intervention with no between group differences recorded.

4. Discussion

This paper systematically reviewed the evidence for the efficacy of online anti-stigma interventions for promoting positive help-seeking attitudes, intentions, and behaviours with young people. Results revealed that online anti-stigma interventions were mostly successful in reducing public stigma, and to a lesser degree self-stigma, and in improving young people's help-seeking attitudes and intentions. All studies reported decreased stigma levels and a positive increase in help-seeking outcomes including intentions, attitudes, behaviour, MHL post intervention, as well as intervention satisfaction. These findings of reductions across outcomes are also consistent with previous research in both adult and adolescent populations that found stigma and help-seeking outcomes were strongly interrelated (Goh et al., 2021; Waqas et al., 2020).

Psychoeducation delivered in the form of factsheets and self-paced learning modules were a key component of online intervention

programs for young people. Where used, this was predominantly part of a multimodal approach that also included case vignettes, quizzes, tailored feedback and/or interactive activities. Existing literature recommends the use of interventions with multiple components (Johson et al., 2021). Results showed that all interventions, including multimodal and education only, were successful in reducing public stigma, and to a lesser degree self-stigma, and significantly improved young people's help-seeking intentions, with some evidence also suggesting positive trends regarding increases in help-seeking behaviour (Stanley et al., 2018) and improved attitudes (Taylor-Rogers et al., 2014). The effectiveness of individual components was not clearly reported in all reviewed studies; however, some did utilise a single component and also demonstrated improved outcomes. For example, help-seeking attitudes were significantly increased following provision of literacy on depression via a case vignette (Taylor-Rodgers et al., 2014), with help-seeking intentions shown to increase following information on the biological causes of depression (Howard et al., 2018). Thus, while recommended, multimodal interventions may not be required for producing changes in outcomes. Of note, a significant reduction for self-stigma and perceived public stigma at two month follow-up occurred in both a psycho-educational and a novel implicit bias retaining comparative intervention analysis (Stanley et al., 2018). Two-thirds of participants reporting significant clinical change belonged to the novel condition, potentially indicating that interventions which incorporate innovative techniques may present a more effective means for modifying cognitions surrounding help-seeking stigma than education alone (Hom et al., 2015).

The reviewed studies showing the utility of online interventions for stigma reduction emphasise the value of online delivery, which can promote participant engagement with such resources (Collins et al., 2011) and allows potentially easier access to professional services to promote help-seeking. Even though stigma and low levels of mental health literacy present barriers to help-seeking (Aguirre et al., 2020), to maximise effectiveness, interventions may benefit from incorporating innovative strategies within multimodal designs which are delivered within an intensive and tailor-made format to translate help-seeking intentions into help-seeking behaviours (Tomczyk et al., 2018).

None of the reviewed studies explicitly utilised a Health Behaviour Model, despite current and past literature espousing the importance of their inclusion within intervention development (Rickwood et al., 2005; Pretorius et al., 2019; Johnson et al., 2022). For example, research regularly utilises health models such as The Theory of Planned Behaviour (TPB; Ajzen, 1991) as it is often able to explain a significant amount of variance in help-seeking intentions (Allouche et al., 2021), however its utility remains limited unless more behavioural outcome measures are included. In considering this, both Cognitive Behavioural Therapy (CBT; Beck, 2005) and Cognitive Bias Modification (CBM; Macleod, 2012) paradigms were utilised within intervention development (Collins et al., 2011; Shandley et al., 2010 and Stanley et al., 2018). CBT is an efficacious treatment for a variety of mental health disorders (Ebert et al., 2017). CBT's key mechanism behind behaviour change is an individual's belief system with this key tenet also shared with TPB. When offered as part of an online medium, there is evidence that CBT can help individuals identify and change maladaptive cognitions, which in-turn, can influence behaviour (Mohr et al., 2005; Tutty et al., 2005). For example, ROC embedded CBT principles within their online video game to help young people recognise and develop skills for coping with life stressors that can precipitate mental health problems. Additionally, the study by Stanley et al. (2018) adapted the principles of CBT to retrain participants' implicit maladaptive cognitions towards mental illness and help-seeking behaviours by positively reinforcing associations regarding their perceptions of self and what it means to seek help. Known as Cognitive Bias Modification (CBM; Macleod, 2012), this study suggests that it is possible to build into scalable brief interventions a capacity to decrease stigma that can increase connections to care that is durable across time.

There is some evidence that online interventions for help-seeking can

result in positive improvements to people's attitudes, stigma levels, and intentions to seek help within the general population (Collins et al., 2011; Davies et al., 2018; Howard et al., 2018; Shandley et al., 2010; Stanley et al., 2018; Taylor-Rodgers et al., 2014). However, the research is more limited about evaluation of the effectiveness of online anti-stigma interventions that increase young people's help seeking attitudes, intentions, and behaviours. Given that online interventions can reduce both public and perceived self-stigma and result in increased help-seeking outcomes that are potentially sustained over time (Stanley et al., 2018; Shandley et al., 2010), this suggests that any future models of online interventions to reduce stigma in young people should be premised on a help-seeking model (e.g., Rickwood et al., 2005) and incorporate paradigms such as CBT or CBM. This can potentially result in interventions that engage such required mechanisms of change with the capacity to overcome common help-seeking barriers such as geographic proximity and preferences for informal services (Radez et al., 2021; Aguirre Velasco et al., 2020) without compromising intervention quality or effectiveness.

Young people were the focus of this review given the high prevalence of mental health problems in this population coupled with low-rates of help-seeking (Allouche et al., 2021). Differences between younger and older adolescents have been noted within past research with older adolescents tending to have fewer help-seeking fears and younger adolescents a greater awareness about formal sources of help and higher intentions to seek help (Nearchou et al., 2018). However, none of the included studies specifically compared younger and older adolescents.

Shandley et al. (2010) found gender to be a significant predictor of outcomes for online interventions, stigma and help-seeking which is consistent with prior research (Aguirre Velasco et al., 2020). Females were found to be more likely to experience a decrease in stigma post-program, alongside being more open to receiving both formal and informal help. Males, however, experienced smaller decreases in stigma post-program and tended to seek out informal help. Males were under-represented in the various samples across the included studies, however, the above results align with suggestions that having or disclosing a mental illness to others can pose a significant threat to the identity of young males (Shandley et al., 2010). As such, they are less likely to seek formal help and instead express a preference for informal support and self-reliance (Shandley et al., 2010; Allouche et al., 2021). This does present an opportunity to more specifically target young males with online self-help interventions as they may find anonymity with such interventions less confronting. Online interventions may also allow young males to proceed at a pace that is comfortable for them, with the goal of such online interventions being to ultimately promote and increase the connection of young males to appropriate formal care services.

For online interventions to be successful, there must be user satisfaction (Peynburg et al., 2020). The evidence supports that when people have a positive experience using such services, they are more inclined to recommend them to friends because they are easy to use, less stigmatising, and more accessible than traditional modes of delivery (Collins et al., 2011; Shandley et al., 2010; Davies et al., 2018 and Taylor-Rodgers et al., 2014). Satisfaction was shown to be generally high for each intervention with no between group differences recorded. For young people and young males in particular, such endorsement by peers would be a major selling point because it can break down the stigma of accessing such interventions.

This current review has identified a small body of evidence regarding the potential for online anti-stigma interventions to improve help-seeking rates with young people. However, there remains the need for more rigorous evaluation of online anti-stigma interventions. To date, all studies were conducted in Western English speaking developed countries, utilised convenience sampling, and often possessed small sample sizes, with demographic information concerning age, years at school and location not all individually captured, which may affect the generalisability of the findings. Where captured, specific sample

characteristics may also be under or over-represented due to self-selection bias stemming from participant recruitment strategies (e.g., targeting schools, universities, and existing ROC users). Thus, larger, and more representative samples may benefit future research within the adolescent population. There also needs to be attention to methodology given the varied study quality identified in such studies thus far. For example, longer follow-up is required to provide understanding of sustainability and durability of any changes, with only two studies having follow-up longer than immediately post-intervention. Additionally, there is limited reliance on validated measures that can be used to measure stigma (public and self) and help-seeking outcomes such as attitudes, intentions, and behaviour. User satisfaction also needs to be considered as part of such measures. Stigma reduction and help-seeking have not always been the primary focus of studies. Instead, the focus has been on promoting self-help via discussion forums and structured e-Learning modules (e.g., Collins et al., 2011; Shandley et al., 2010; Davies et al., 2018). Despite the paucity of high quality research specific to the reviews aims, the assessment of individual outcome variables associated with help-seeking, e.g., attitudes, intentions, and behaviours is important as many studies acknowledged that improved intentions did not always translate to help-seeking behaviours. Therefore, interventions focusing on stigma reduction and help-seeking are needed to support and assist young people with connection to formal care.

Future research in this area may benefit from studies that explicitly utilize help-seeking models or paradigms within the intervention design, which might also include tailored elements targeting stigma (public and self), help-seeking attitudes, intentions, and behaviours as seen in Stanley et al. (2018) study. However, such studies also need to reliably capture young people (under 18 years of age), and also include relevant demographics such as their gender, education level, location, level of distress and nature of concern. The propensity for mental health issues in young males (Allouche et al., 2021) suggest this group should be a specific focus of research.

5. Limitations

This systematic review provides insight into the utility of help-seeking interventions but there are limitations. First, a meta-analysis could not be conducted due to the small number of eligible studies identified and the heterogeneity of the research (e.g., within study designs, intervention delivery and study quality). Second, only peer-reviewed studies were included, thus publication bias might impact results. Third, only articles published in English were included, and all included studies were from Western English speaking developed nations, thus results may be culture-bound. Lastly, this review had a narrow focus on specific mental health problems being anxiety, depression, emotional distress, suicidal thoughts, and self-harm. Other prevalent mental health issues within this age group should be considered such as disordered eating and substance misuse (WHO, 2018). Despite these limitations, this review provides a foundation of empirical support for the utility of online anti-stigma interventions in increasing mental health help-seeking in young people.

6. Conclusion

The review highlighted that online interventions are routinely successful in reducing public stigma, and to a lesser degree self-stigma, and in improving young people's help-seeking intentions, attitudes and behaviours. However, there is a need for higher quality evaluations that assess the complex interplay between relevant variables and conducted with a more diverse sample representative of the target population over a longer time period to assess the durability of intervention effects. In sum, this review provides an important foundation for the development and testing of future online anti-stigma interventions.

Relevance to clinical practice

Despite the small body of research, there are strong practical implications for the effective delivery of online anti-stigma interventions that target young people, including wide-spread availability, cost-effectiveness and user preference. Strategies which engage mechanisms of change such as CBT and CBM principles for stigma reduction have indicated promising trends towards modifying young people’s maladaptive attitudes towards help seeking (e.g., Collins et al., 2011; Shandley et al., 2010 and Stanley et al., 2018). With continued exploration, these paradigms could play a significant role in bridging the gap between intention and actual help-seeking actions within this population.

Author statement

We confirm that the manuscript has been read and approved by all named authors and that there are no other persons who satisfied the criteria for authorship but are not listed. We further confirm that the order of authors listed in the manuscript has been approved by all of us.

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Appendix A. Search Concepts used

- 1. Help-seeking* OR “Help Seeking” OR “Seek Treatment” OR “Self Help” OR “Help Seeking Behaviour” OR “Help Seeking Techniques”
AND
- 2. “Mental Health” OR “Mental Illness” OR Depression* OR Anxiety* OR Suicide* OR Self-harm* OR “Emotional Distress” OR “Mental Disorder”
AND
- 3. “Young People” OR “Young Adults” OR Adolescents* OR Youth* OR Teenagers*
AND
- 4. Stigma* OR “Self Stigma” OR “Public Stigma” OR Shame* OR Denial* OR Avoidance*
AND
- 5. Internet* OR Online* OR Web-based* OR e-health* OR “Information Technology”
AND
- 6. Intervention* OR “Self Help” OR Support* OR Therapy* OR Program* OR Counselling* OR Psychoeducation* OR “Mental Health Support”

Appendix B. JBI Quality Assessment

Random Controlled Studies (RCTs)	Q.1	Q.2	Q.3	Q.4	Q.5	Q.6	Q.7	Q.8	Q.9	Q.10	Q.11	Q.12	Q.13
Davies et al. 2018	Yes	No	Yes	No	No	Yes	No	Yes	Yes	Yes	Unclear	Yes	Yes
Howard et al. 2018	Yes	Yes	Unclear	Yes	Unclear	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Stanley et al. 2018	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Unclear
Taylor-Rodgers et al. 2014	Yes	Yes	Unclear	Yes	No	No	Yes	Yes	Yes	Yes	Unclear	Yes	Yes
Cross-sectional Study	Q.1	Q.2	Q.3	Q.4	Q.5	Q.6	Q.7	Q.8					
Collins et al. 2011	Unclear	Yes	Yes	Yes	No	No	Unclear	Yes					
Quasi Experimental Study	Q.1	Q.2	Q.3	Q.4	Q.5	Q.6	Q.7	Q.8	Q.9				
Shandley et al. 2010	Yes	Yes	Unclear	No	Yes	Yes	Yes	Unclear	Yes				

JBI Critical Appraisal Checklist Questions:
Random Controlled Study Checklist: Tufanaru et al. (2020).

Scholarship.

CRediT authorship contribution statement

Laura Williams: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Validation, Visualization, Writing – original draft, Writing – review & editing. **Warren Bartik:** Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing – review & editing. **Suzie Cosh:** Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing – review & editing.

Declaration of competing interest

None.

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1. Was true randomisation used for assignment of participants to treatment groups?
2. Was allocation to treatment groups concealed?
3. Were treatment groups similar at the baseline?
4. Were participants blind to treatment assignment?
5. Were those delivering treatment blind to treatment assignment?
6. Were outcomes assessors blind to treatment assignment?
7. Were treatment groups treated identically other than the intervention of interest?
8. Was follow up complete and if not, were differences between groups in terms of their follow up adequately described and analysed?
9. Were participants analysed in the groups to which they were randomized?
10. Were outcomes measured in the same way for treatment groups?
11. Were outcomes measured in a reliable way?
12. Was appropriate statistical analysis used?
13. Was the trial design appropriate, and any deviations from the standard RCT design (individual randomisation, parallel groups) accounted for in the conduct and analysis of the trial?

Cross-Sectional Study Checklist: Moola et al. (2020).

1. Were the criteria for inclusion in the sample clearly defined?
2. Were the study subjects and the setting described in detail?
3. Was the exposure measured in a valid and reliable way?
4. Were objective, standard criteria used for measurement of the condition?
5. Were confounding factors identified?
6. Were strategies to deal with confounding factors stated?
7. Were the outcomes measured in a valid and reliable way?
8. Was appropriate statistical analysis used?

Quasi-Experimental Studies Checklist: Tufanaru et al. (2020).

1. Is it clear in the study what is the 'cause' and what is the 'effect' (i.e., there is no confusion about which variable comes first)?
2. Were the participants included in any comparisons similar?
3. Were the participants included in any comparisons receiving similar treatment/care, other than the exposure or intervention of interest?
4. Was there a control group?
5. Were there multiple measurements of the outcome both pre and post the intervention/exposure?
6. Was follow up complete and if not, were differences between groups in terms of their follow up adequately described and analysed?
7. Were the outcomes of participants included in any comparisons measured in the same way?
8. Were outcomes measured in a reliable way?
9. Was appropriate statistical analysis used?

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