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Review article

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The psychological consequences of mental health awareness efforts

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Abstract

Public health campaigns that raise awareness about mental health problems are designed to decrease stigma, increase help-seeking and improve mental health literacy. However, there is some theoretical concern that, alongside benefits, such campaigns might negatively impact how some individuals interpret, label and respond to mental health problems. In this Review, we summarize the extant evidence for the positive and negative psychological impacts of mental health awareness efforts. We integrate theoretical literature with studies using experimental designs in which mental health awareness content is manipulated in a controlled environment that might provide preliminary insights into potential causal relationships. We find that awareness materials can change cognitions and beliefs relating to one's own mental health and to mental health more generally (such as self-diagnosis and beliefs about recovery). These effects can vary depending on individual characteristics (such as existing symptoms, stability of self-concept and suggestibility), the message being presented, identification with the messenger, and whether there is personalized information about one's own symptoms. We discuss the implications of this work for adolescent populations and directions for future research.

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Introduction

Over the past twenty years there has been an increase in public awareness about mental health problems in the Western world. Many initiatives underlie this shift. First, there have been public health campaigns (such as Time to Change in England) designed to decrease mental health stigma and increase help-seeking by improving mental health literacy[1,2]. Second, there has been a growing focus on mental health support in education, with schools and universities increasingly considered to be sites of psychoeducation and the prevention or treatment of mental health problems[3–5]. Finally, there has been mass dissemination of mental health information online, with many public health bodies and charities sharing mental health awareness content via social media[6]. Ultimately, the goal of all these initiatives — collectively described as mental health awareness efforts[7] — has been to improve individuals' thoughts, feelings and behaviours in relation to their own and other people's mental health problems, based on the premise that public dissemination of information can drive meaningful change.

There is some evidence that mental health awareness efforts are associated with positive outcomes such as mental health literacy, help-seeking and stigma reduction[1,8]. However, a growing number of voices suggest that mental health awareness efforts might lead to some unintended negative consequences. First, there is concern about universal mental health interventions in educational settings in which young people are taught about psychoeducation, mental health literacy and/or coping strategies borrowed from therapeutic approaches (such as mindfulness or cognitive behavioural therapy) in whole-classroom settings[9,10]. Academics critiquing this approach have argued that, despite good intentions, programmes that encourage young people to focus on their mental health might inadvertently promote a sense of vulnerability, fragility and victimhood[11,12]. Several high-quality trials have now found that school mental health interventions can have negative effects on mental health outcomes, which offers some empirical support for these theoretical concerns[13–16]. However, the mechanisms driving negative effects are unclear and other aspects of whole-school approaches to mental health (for example, staff training, access to one-to-one support or creating a positive school climate) can be very valuable[4].

Outside the school context, academics and commentators have expressed concern that mental health awareness efforts might lead to excessive and inaccurate use of psychiatric language, which has been referred to as the 'psychiatrization of society'[17]. Some people with lived experience of a disorder feel angry that this terminology is being trivialized or used flippantly[18], which has led to a sense of so-called diagnostic possessiveness over certain diagnostic terms such as 'bipolar disorder'[19]. These concerns are not unfounded: there is experimental evidence that concept creep (the societal semantic expansion of harm-related concepts such as trauma and bullying) leads individuals to perceive those terms less seriously[20,21].

In this Review, we examine the literature on the psychological impacts of mental health awareness efforts. First, we summarize the evidence (primarily from cohort and survey studies) that supports the use of mental health awareness campaigns. Then, we summarize potential disadvantages and negative consequences of mental health awareness efforts. Next, we review experimental evidence from studies in which mental health awareness content was manipulated in a controlled environment; such studies might provide preliminary insights into potential causal relationships between mental health awareness content and specific mental health outcomes. We report both positive and negative outcomes, but acknowledge the ambiguity in this categorization (some outcomes can have both positive and negative aspects). Finally, we discuss the potential implications of these findings for adolescent populations and directions for future research.

Evidence in support of awareness campaigns

Mental health awareness efforts have multiple aims: to improve mental health literacy (for example, by providing clear and accessible information about symptoms, treatment options and impact of diagnosis), reduce stigma towards those with mental health problems, and increase help-seeking behaviour, with the overall goal of reducing suffering and improving quality of life across the population[22,23]. There is evidence, primarily from cohort and survey studies, that awareness campaigns (Table 1) successfully achieve some of these positive outcomes. For example, a systematic review of 15 awareness campaigns in 8 primarily Western countries (Canada, the USA, Ireland, Germany, Sweden, Australia, Hong Kong and Austria) found that awareness campaigns reduced stigma. That is, individuals showed positive changes in attitudes, beliefs and intentions towards those with lived experience after the intervention (versus before the intervention or compared to a control group who did not see campaign materials)[22]. However, some studies testing these effects had markers of low quality or lacked sufficient detail to support reproducibility (for example, they were underpowered, did not clearly describe how the campaign was disseminated and/or did not report a clear hypothesis or proposed

Table 1 | Example public awareness campaigns discussed in this article

Campaign	Aim	Timeframe	Location	Empirical evidence for campaign effectiveness
Time to Change	To improve public attitudes and reduce discrimination faced by people with mental health challenges	2007–2021	England	Improvement in mental health knowledge and attitudes towards people with mental health problems[2,24]
Beyond Blue	To increase the capacity of the Australian community to prevent depression and respond effectively to it	2000 to the present	Australia	Improvement in mental health literacy[26,27]
Bell Let's Talk	To reduce stigma, improve access to treatment, and improve corporate responsibility for mental health	2010 to the present	Canada	Increase in mental health service utilization[8]
Act-Belong-Commit	To encourage individuals to adopt habits that protect and improve their mental health	2002 to the present	Australia	A positive association between the belief that the campaign increased openness around mental health problems and help-seeking for mental health problems[28]

mechanism of change)[6,22]; this issue of low quality is pervasive in the experimental literature reviewed in this paper.

One study not included in the above meta-analysis used cohort data and found that the Time to Change campaign in England reduced stigma. Specifically, public attitudes towards those with mental illness were more positive after (versus before) the campaign, and there was a dose–response effect between campaign awareness within a geographic region and the magnitude of attitude improvement in that region[24]. More recent evidence indicates that although public attitudes towards those with mental health problems has improved in England since 2008, positive attitudes peaked in 2019 and declined between 2019 and 2023 (ref. 25), possibly at least partially because of the end of the Time to Change campaign in 2021.

Another study in Australia found that mental health literacy — specifically the ability to recognize particular disorders from vignettes and the accuracy of beliefs about treatments — improved between 1995 and 2011, and the Beyond Blue national depression public health campaign began running in 2000 (ref. 26). These improvements in mental health literacy were larger in states where people reported more awareness of the campaign[27]. Moreover, more positive attitudes about the benefits of help-seeking were reported in states that funded the Beyond Blue campaign (leading to higher exposure for residents) relative to the states that did not (leading to lower exposure for residents)[27].

A second Australian campaign, Act-Belong-Commit, has been running since 2008, and telephone surveys about its impact were conducted in 2018–2019 (ref. 28). This research found a positive association between the belief that the campaign increased openness around mental health problems and help-seeking for mental health problems[28]. This result is based on cross-sectional data, so the direction of the relationship is unclear and there might be relevant common covariates. However, this result could indicate that positive attitudes towards the campaign led individuals to seek help for their own difficulties[28].

There is also evidence that mental health awareness campaigns increase actual or intended help-seeking, which is a key goal of such campaigns[22,23]. For example, one study examined whether an annual large-scale mental health advocacy campaign in Canada (Bell Let's Talk) was associated with an increase in mental health service utilization[8]. Analysis of monthly outpatient mental health visits for 10- to 24-year-olds in Ontario from 2006 to 2015 showed that primary health care and outpatient psychiatric visits increased in the two months after the Bell Let's Talk annual campaign was disseminated on Twitter in February 2012 (ref. 8).

Overall, mental health awareness campaigns might reduce stigma, improve mental health literacy and increase help-seeking or intention to seek help. However, not all campaigns produce (or are intended to produce) all of these outcomes, and not all outcomes have been tested for all campaigns.

Possible harms of awareness efforts

Although mental health awareness efforts have documented benefits, there has been concern that they might also have unintended harms. Academics across a number of disciplines have suggested that using campaigns to encourage individuals to focus on their own mental health, or learn about mental health in general, might increase distress or lead to other problematic outcomes[7,11,12,17,29–37]. Most of this literature does not focus on mental health awareness campaigns specifically, but on related phenomena, such as negative effects of mental health lessons in schools and increases in symptom reporting and self-diagnosis after (versus before) exposure to mental health awareness materials. We provide a brief overview of these theoretical and empirical literatures here to contextualize the experimental evidence that focuses on mental health awareness efforts.

Negative effects of school mental health lessons

There are many benefits to taking a 'whole-school approach' to mental health, in which all school staff receive mental health training, the environment and curriculum is designed to support mental health, and effective one-to-one support is available to young people who need it[3–5]. In parallel, however, there are concerns that teaching mental health information to whole classes might have unintended consequences for young people, including misunderstanding the difference between mental disorders and difficult emotions, feeling pressured to disclose private thoughts, or being hypervigilant towards any experience of negative feelings[11,12,38,39]. Similar arguments have been made about the focus on mental health in university settings: the narrative of a mental health crisis in undergraduate students might undermine their resilience and medicalize typical life stress[31,40].

Concerns about educational settings have been validated by evidence that universal school-based mental health interventions, which typically involve mental health literacy and/or awareness components, can sometimes have negative effects[15]. Meta-analyses have indicated that, on average, universal school mental health interventions do improve mental health problems, albeit with small effect sizes (Cohen's $d < 0.2$; ref. 41) and only over the short term (for example, the effect is present immediately post-intervention but not at the 12-month follow up)[10,42,43]. However, the majority of evaluation studies included in these meta-analyses are of low quality, potentially biasing overall estimates[15,42,43]. Moreover, several high-quality trials have shown that universal mental health interventions based on mindfulness, cognitive behavioural therapy, dialectical behavioural therapy and general mental health awareness[44] can all have negative outcomes, including an increase in internalizing symptoms[14,45–47]. For example, a scoping review of mindfulness and school interventions based on cognitive behavioural therapy found that 9% of all trials and 33% of high-quality trials (that is, those with low risk of bias) found at least one negative effect[15]. One large trial (153 schools, $n = 12{,}166$ student participants) found that a universal school intervention that focused specifically on mental health awareness led to long-term negative effects on internalizing symptoms (that is, internalizing symptoms were higher at the follow up 9–12 months after the intervention compared to before the intervention)[44]. These findings have prompted concerns about the potential risks versus benefits of universal school-based mental health interventions[13,14,16].

The mechanisms underlying these negative effects are unclear[15,48]. One possibility is that the mechanism is akin to the nocebo effect, in which telling individuals about negative side effects of a treatment triggers an expectancy effect that then causes individuals to experience those symptoms (Box 1). This possibility is supported by a meta-analysis which found that trigger warnings for negative content led to more anticipatory anxiety before viewing the content than when trigger warnings were not present[49].

In the school intervention literature specifically, qualitative evidence indicates that school mental health lessons can be distressing or unpleasant in several ways[39]. In one study, participants described how mindfulness lessons at school made them focus on negative thoughts more, made them cry, or made them frustrated because they felt they could not do the exercises[50]. Interview studies have found that the focus on negative thoughts in universal interventions based on

Box 1 | The nocebo effect as a potential mechanism

Mental health awareness efforts could potentially lead to worse symptoms and higher rates of self-diagnosis because they change people's expectations about their mental health. Over the past 40 years, health researchers have studied the role of expectations on treatment outcomes in the context of placebo effects, where symptoms improve as a result of the person's belief that an inert treatment is effective. In other words, how a person expects to respond internally to an experience can influence mental and physical symptoms[123–125].

A growing body of research is now also exploring the nocebo effect, where expecting negative outcomes from a treatment makes those negative outcomes more likely to occur. Indeed, believing that a treatment will cause unpleasant physical or psychological symptoms (such as anxiety and hypersensitivity) leads to more of these symptoms over time[100]. A meta-analysis of 73 studies across various conditions and treatments showed that participants who were induced to expect side effects (for example, via verbal instruction) experienced moderately worse side effects, as well as worse pain, fatigue, itching and other physical symptoms compared to participants who were not induced to expect negative effects. The overall magnitude of the nocebo effect found in this meta-analysis was moderate ($g = 0.522$)[100]. Other studies have found nocebo effects for mental health symptoms such as mood, stress, and anxiety. For example, informing participants about 'wind turbine syndrome' — a condition ostensibly caused by wind farm sounds and characterized by physical and affective symptoms — led to worse mood and anxiety in participants exposed to wind farm sounds, compared to a control group exposed to the same sounds but given biological explanations for auditory and visual symptoms[126–128].

Although there is limited research on the nocebo effect in the context of mental health awareness, there is indirect support for nocebo effects in the context of physical health awareness efforts. For instance, consuming health content on social media has been linked with the rise of functional tics among adolescent girls[129]. These symptoms are distinct from Tourette's syndrome's characteristic tics[130] and instead are suggested to arise as a result of social learning and negative expectations[131,132]. Furthermore, there is literature on the negative consequences of being labelled with a diagnosis. For example, a meta-analysis found that participants who were falsely labelled as having sustained a traumatic brain injury experienced a modest worsening in their objective cognitive performance on various neuropsychological tests compared to participants who were not falsely labelled as having sustained a traumatic brain injury ($d = 0.19$, confidence interval = −0.04, 0.41)[133].

Although mental health awareness efforts are not in themselves a treatment, they might still induce a nocebo effect by negatively shaping people's expectations about their psychological state, consequently leading them to misinterpret normal distress as pathological. Over time, this might, paradoxically, cause more distress. Indeed, many mental health efforts encourage individuals to pay attention to their distress and to acknowledge that they might be at risk of mental health symptoms. For example, many charity and public health campaigns promote the message that mental health problems are very common in the general population, and that people are likely to experience many of them in their lifetime (similar to the messaging about medication side effects in nocebo studies). Receiving such messages might lead to symptom worsening because of increased attention to and anxiety about symptoms. Future studies should explore how negative expectations shape people's perception of their mental health and subsequent levels of distress.

cognitivebehavioural therapy made some young people feel low, even when they had initially felt positive[51,52]. In one trial assessing mindfulness or relaxation lessons, some participants said the content of the lessons made them feel physically uncomfortable, bored or upset[53].

This literature on universal school mental health interventions is complicated by the fact that many of these interventions combine general awareness content (for example, psychoeducation and mental health literacy) with practical exercises based on therapeutic modalities (for example, cognitive behavioural therapy or mindfulness), and it is unclear which component or components are associated with negative effects. However, there is now enough quantitative and qualitative evidence to support the concern that some aspects of these mental health lessons have negative effects; that is, universal school mental health interventions are a real-world setting in which mental health awareness efforts might lead young people to have negative thoughts and feelings[15,48].

Increased symptom reporting and self-diagnosis

Mental health awareness efforts might be contributing to the increase in reported rates of mental health problems over the past ten years, as suggested by the prevalence inflation hypothesis[7]. This prevalence inflation could arise via two mechanisms. First, mental health awareness efforts might lead some individuals to report previously under-recognized symptoms more accurately, which would be a beneficial outcome. Second, and more problematically, awareness efforts might lead some individuals to interpret and report milder forms of distress as mental health problems[7]. In other words, mental health awareness materials might be shaping viewers' understanding of mental health, including their own symptoms, in a way that might ultimately be unhelpful for them[29,31,34]. For example, framing symptoms as evidence of a mental health problem might subsequently maintain or exacerbate symptoms, creating a self-fulfilling prophecy[7,54,55].

In a related way, mental health awareness efforts might be responsible for more self-diagnosis (people diagnosing themselves with a mental disorder in the absence of input from a professional)[56–58]. Self-diagnosis is not inherently problematic – a key aim of mental health awareness efforts is to encourage individuals to recognize mental health problems in themselves[1,59], and many people who self-diagnose do so accurately[60]. However, the concern is that individuals might self-diagnose with a disorder they do not have if they misunderstand typical stress as a sign of a disorder[7,33,55,61–63]. Such an inaccurate self-diagnosis is theorized to cause additional distress, lead to unnecessary treatment, or trigger a self-fulfilling prophecy where existing symptoms are exacerbated[7,55,62,63]. In addition, inaccurate self-diagnosis can have consequences beyond the individual if it happens at scale, because it might shift the focus of resources and support towards the milder end of the mental health spectrum and

away from the individuals most in need[58,62], and lead to scepticism towards anyone using diagnostic language[18].

Taken together, this literature highlights several concerns regarding how — alongside their benefits — mental health awareness efforts might be partly responsible for the increasing psychiatrization of society, overpathologization and inaccurate self-diagnosis.

Experimental studies

A small but growing body of experimental evidence suggests that there are causal associations between materials used in awareness efforts and the psychological effects of these interventions. In this section we review 11 studies from 2010 to 2025 that used experimental methodology to assess the positive and negative impacts of mental health awareness content on individuals' self-diagnosis and symptom reporting and beliefs about mental health more generally. We specifically focus on studies in which the outcomes were self-reported mental health symptoms and/or cognitions related to mental health, including beliefs, attitudes and knowledge about one's own and others' mental health. We excluded studies with major methodological flaws (for example, those having no control condition).

Diagnostic labelling and symptom reporting

There is experimental evidence that mental health awareness materials can influence self-diagnosis and the use of other diagnostic language without changing self-reported symptoms. In one study[64], participants were exposed to an artificial social media post of a user's selfie with a caption disclosing the user's anxiety in a way that either normalized anxiety (that is, described anxiety as normal, appropriate to discuss and common) or did not normalize anxiety (that is, described anxiety as uncommon and severe). Participants exposed to the normalizing post considered anxiety to be more common in general and were more likely to report that they might have an anxiety disorder now or in the future than participants exposed to the non-normalizing post[64]. However, self-reported measures of anxiety or stress did not differ according to which post was seen. These results suggest that viewing certain mental health messages on social media can lead individuals to update their beliefs about the prevalence of mental health problems; this result is unsurprising and is akin to demonstrating that the experimental manipulation worked. Importantly, however, self-reported symptoms did not change, suggesting that mental health information can make individuals more inclined to frame the same level of symptoms as a potential anxiety disorder[65].

Similarly, participants who read psychoeducational material that described trauma as a broad concept (any event that might cause emotional distress) were more likely to rate watching a distressing, violent film clip as a trauma at follow-up (a minimum of 48 hours later) compared to participants who read psychoeducational material that described trauma as a narrow concept (reserved for exceptionally severe events). However, the groups did not differ in their experience of post-traumatic stress disorder-like symptoms (based on self-report measures of distress related to watching the film) either immediately after the film or at follow-up[65]. As with the study described above, this finding is akin to a successful manipulation check; the psychoeducational materials caused participants to update their belief about the meaning of the word 'trauma'. More importantly, the materials did not lead to an increase in symptom reporting after watching the film, suggesting that psychoeducation information about trauma can change symptom conceptualization without increasing symptoms themselves.

Finally, participants who read a newspaper article claiming that food addiction was real and scientifically proved were more likely to self-diagnose as having food addiction than those who read a newspaper article claiming that food addiction was a myth[66]. Importantly, there were no differences in the groups' mean intake of indulgent foods, food-dependence symptoms or mood ratings[66], suggesting that mental health information shaped participants' beliefs about mental health without changing their symptom reporting. However, given the small sample size ($n = 60$) compared to the studies described above ($n = 654$ in ref. 64; $n = 293$ in ref. 65) and lack of baseline self-diagnosis measures, interpretation of these findings is limited.

The studies described above suggest that mental health information can shape participants' beliefs about mental health without changing their reported symptoms. One study suggests that this effect might be partially mitigated by informing people about the nocebo effect[67]. Participants assigned to an attention-deficit/hyperactivity disorder (ADHD) awareness workshop in which they learned about signs of undiagnosed ADHD in adults were more likely to self-diagnose with ADHD immediately after the workshop compared to participants who attended a control workshop on sleep hygiene, despite no differences in self-reported symptoms between groups; this difference persisted a week later[67]. Importantly, a third group of participants received information about the nocebo effect in addition to the ADHD-related awareness content (that is, they were told that negative expectations cause symptom misattribution and worsening). The rate of false self-diagnosis in this group was half that in the ADHD awareness group immediately after the workshop, and there were no differences in self-diagnosis between groups one week later[67]. Thus, being exposed to ADHD awareness information might make individuals more likely to frame their experiences as evidence of potential ADHD despite no changes in actual symptoms, but education can buffer against this effect.

It is somewhat ambiguous whether an increase in self-diagnosis or diagnostic language is a positive or negative outcome. In a real-world context, whether this labelling is helpful or unhelpful will depend on whether it is accurate (that is, the individual has correctly identified a disorder that was otherwise unacknowledged) and whether that labelling leads to effective help-seeking and support. In the aforementioned ADHD study[67] participants were pre-screened and were only included if they were below the threshold for probable ADHD. Thus, the results showed that awareness materials promoted self-diagnosis in individuals who do not meet criteria for diagnosis, suggesting a problematic outcome. However, in other studies the accuracy of the increase in self-diagnosis is unclear. This is a key avenue for future research. In addition, a broader ethical point is that any studies assessing potential increases in self-diagnosis must consider the risk–benefit trade-offs of such studies regarding possible false diagnosis, and ensure effective debriefing and follow-up checks to minimize harm or any long-term inaccurate beliefs. Debriefing and/or follow-up checks have been reported in some of the reviewed studies[66,67] but not in others[64,65].

Although the studies described above found no effect of general mental health information on self-reported symptoms, three studies indicate that receiving misleading information about one's own symptoms can increase subsequent reporting of those symptoms. In one study, participants completed a self-report questionnaire about a range of psychological symptoms[68]. One week later, the researchers presented participants with specific questionnaire items and their previous numerical responses and asked them to explain their responses.

For some items about emotional distress, the participants' answers were artificially inflated. Participants accepted these inaccurate scores as correct, and were more likely to endorse these emotional distress items one week later compared to items that were not artificially inflated. A similar study asked participants to complete a questionnaire about psychological and somatic symptoms, and then gave them immediate computerized feedback that inflated some of those symptoms[69]. When subsequently given the same questionnaire to complete (in the same testing session), participants' ratings for the manipulated items increased, whereas ratings for the control items did not[69]. These findings echo a similar body of literature demonstrating that receiving false personalized feedback about one's heart rate increases reports of anxiety (Box 2).

In another study, undergraduate students were asked to imagine that they (or a friend) had chronic fatigue syndrome and to write a story describing how it impacted their (or their friend's) life; a control group of participants was asked to write about why they had chosen their degree subject[70]. Participants who wrote about the fictitious effects of chronic fatigue syndrome subsequently had higher self-reported somatization symptoms than control participants[70].

These studies that manipulated information about one's mental health are relevant to the potential impacts of mental health awareness efforts because awareness materials often encourage viewers to reflect on the possibility that they have mental health problems and to identify symptoms in themselves. For example, a public health campaign advert might highlight that mental health problems are common or describe a list of common symptoms. Presenting mental health problems as common or socially normative could then lead to a belief that the individual is experiencing the symptoms or disorder that were the focus of the awareness materials, either immediately or at a later date. Whether this change in beliefs is a beneficial or problematic outcome will depend on a number of factors, such as whether the individual was previously under-acknowledging their symptoms, whether they seek help for their symptoms, and whether that help is effective in reducing symptoms.

Box 2 | Effects of bogus physiological feedback

Providing individuals with false physiological feedback about their bodies leads to an increase in self-reported anxiety. Specifically, monitoring participants' heart rate and providing false feedback about that heart rate has a greater impact on self-reported symptoms of anxiety in individuals with a history of panic attacks or current panic disorder[101–103], in individuals with social anxiety disorder[104,106], and in individuals with high levels of obsessive–compulsive disorder symptoms[105] compared to individuals without these disorders or symptoms.

Mental health awareness efforts do not provide physiological feedback in this way, but these efforts are likely to involve some degree of personalized feedback. For example, they might encourage individuals to complete an online questionnaire to assess their symptoms, ask a chatbot to infer symptoms, or use a smart device that provides physiological feedback about stress levels. Such information might impact an individual's self-reported anxiety and distress, particularly in individuals who already have mental health problems.

Beliefs and attitudes

There is also evidence that experimental manipulation of mental health awareness materials can impact mental-health-related beliefs about recovery. In one study, participants saw a series of Twitter (now X) posts characterizing recovery from a growth mindset perspective (that symptoms are changeable, treatable and people have agency and/or control over them), a fixed mindset perspective (that symptoms are permanent, stable and people have little control over them) or control posts (unrelated to mental health). Participants in the growth mindset group were more likely to endorse that individuals in general have self-efficacy over mental health symptoms (that is, that they have control over their mental health and recovery) and less likely to endorse that mental health problems were permanent or stable compared to participants in the fixed mindset and control groups[71]. There were no differences between groups in beliefs about length of prognosis and treatment effectiveness, or self-reported mood either before or after the manipulation[71]. Speculatively, these results might arise because awareness-related messages relating to a growth mindset might help individuals to feel more empowered to improve or seek help for their mental health problems, whereas awareness-related messages relating to a fixed mindset might lead to less optimism about recovery and therefore less help-seeking. Thus, whether awareness-related messages have positive or negative outcomes may depend on message framing. However, more studies are needed to assess this possibility.

Two further studies have shown that diagnostic information about an individual's own mental health problems can influence their beliefs about the aetiology and treatment of that problem. One study found that participants who received a bogus but credible-looking biological test demonstrating that their depressive symptoms were caused by a chemical imbalance in the brain had worse prognostic pessimism, less regulation of negative mood (potentially a proxy for worse depressive symptoms) and saw pharmacotherapy as more credible than psychotherapy, compared to control participants who were told that they did not have a chemical imbalance[72].

Another study found that similar false diagnostic information can also influence behaviour[73]. Female participants completed two computerized tasks that purportedly measured their addictive tendencies towards food. Participants who were given bogus feedback that they had high-addiction tendencies subsequently consumed fewer calories than participants who were told they had low-addiction tendencies. A follow-up study found that the effect of the high-addiction condition on food intake was mediated by increased dietary concern, which reduced the amount of time participants willingly spent exposed to the foods during the taste test[73]. This evidence suggests that diagnostic information – even if false – can shape individuals' beliefs and behaviours. Although in some cases providing feedback can be useful if it leads to better self-understanding and access to help, overinterpretation of these symptoms can be potentially harmful if it is inaccurate and does not lead to effective help.

Moderators and individual differences

Preliminary experimental evidence suggests that there are individual differences in the psychological impact of mental health awareness efforts. In one study, participants completed the Beck Depression Inventory II and were divided into high-symptom (scores 14 and above) and low-symptom (scores below 14) groups[74]. All participants then viewed real public service announcement videos that focused on either the importance of being supportive towards a friend with mental illness (the 'friend' announcement) or the importance of avoiding negative

labels associated with mental illness such as 'psycho', 'crazy' and 'lunatic'. Qualitative analysis of responses to open-ended questions showed that participants responded favourably to both public service announcements; however, those with high (versus low) depressive symptoms responded less favourably and more frequently indicated that the public service announcements had caused them unintended harm. Specifically, some participants in the high-symptom group said that the 'friend' announcement made them take stock of their friends, reminded them of their lack of support network, and made them feel that people with depression, such as themselves, should not expect others to be there for them[74]. Thus, these results show that public service announcements can have positive effects but might be perceived more negatively by individuals with depression compared to individuals without depression.

Two previously described studies also found evidence of individual differences in responses to awareness materials. First, in the study that assessed the effects of ADHD materials, participants with lower self-understanding (that is, a less stable and consistent self-concept) were more likely to self-diagnose with ADHD both immediately after attending the ADHD awareness workshop and one week later[67]. These results highlight that young people whose identity is still in flux might be more likely to self-diagnose after being exposed to mental health awareness materials.

Second, the association between exposure to a social media post normalizing anxiety and classifying one's symptoms as an anxiety disorder was mediated by two variables: the extent to which the participant liked the person in the posts and the extent to which they identified with them[64]. Specifically, viewing normalizing posts predicted higher identification with or liking of the user, which in turn predicted greater anxiety symptoms and self-diagnosis[64]. These results align with a large body of research in marketing, public policy and behavioural economics showing that the extent to which an individual is influenced by information depends on who delivers the message and the individual's response to them (messenger effects[75–77]). Specifically, the messenger's perceived authority and likeability and their similarity to the recipient increase a message's influence on a recipient's behaviour or beliefs[76]. In the context of mental health awareness materials, knowledge of messenger effects could be used to design materials that maximize the likelihood of beneficial outcomes (such as increased help-seeking) and minimize the risk of negative outcomes (such as inaccurate self-diagnosis or beliefs about mental health).

The importance of individual differences in the context of mental health awareness is echoed in the wider literature on nocebo effects. A systematic review and meta-analysis of 17 studies found that greater expectations about experiencing symptoms (typically pain or itching) were associated with stronger nocebo effects, and that being anxious about experiencing symptoms modestly moderated the magnitude of nocebo symptoms[78]. Another meta-analysis of ten studies found that trait responsiveness to suggestions (that is, suggestibility) had similar moderating effects[79]. Thus, laboratory studies have found that being more anxious, open to suggestion, and holding negative expectations can increase the risk of experiencing worse mental health symptoms as a result of learning about such symptoms; individuals with these traits and beliefs might also be more susceptible to negative effects of mental health awareness efforts. By extension, individuals who are less anxious, less open to suggestion, and have more positive expectations might be less likely to experience negative effects of mental health awareness campaigns and more likely to experience their intended benefits.

Together, the evidence reviewed here suggests that the mental health awareness materials currently being disseminated can have a meaningful impact on how people understand, label and respond to mental health problems, including their own. These effects could be positive or negative depending on the accuracy of the updated belief and whether resulting help-seeking or treatment leads to a reduction in symptoms[80] (Fig. 1). For example, consider an individual who has depression but has not yet identified it as such. If she is exposed to a mental health awareness campaign that leads her to recognize her symptoms as depression, and as a result she seeks help and receives treatment that resolves her symptoms, then this is clearly a positive result from an awareness campaign. However, a second individual might identify herself as having depression because of the awareness campaign but find that the help is either not available or not effective (which is plausible, given current treatment wait times and variable treatment effectiveness[81,82]). In this instance, the effect of the awareness campaign is ambiguous. A third individual who is experiencing low mood but does not have depression might be exposed to the same campaign and conclude inaccurately that he has depression. This inaccurate self-diagnosis could lead to a number of negative outcomes for the individual, such as an exacerbation of symptoms or a reduced sense of agency in improving her mood[35,55,62].

Implications for adolescence

There is particular theoretical interest regarding the psychological impact of mental health awareness efforts on adolescents (10–24 years old)[83] because of the unique features of this developmental period. Specifically, adolescence is a time of identity development, heightened risk for developing mental health problems, and heightened susceptibility to social influence. We consider each of these features in turn.

First, adolescence is a formative period of identity development, during which individuals navigate the complex process of understanding and defining who they are and communicating that to others[84,85]. Although identity development begins in childhood and continues throughout adulthood, it is during adolescence that this process takes on a greater importance: it is a period of many first independent experiences, which are particularly likely to impact self-understanding[86] and guide future beliefs and behaviour. In a related way, adolescence is also the first time during which individuals have the cognitive capacity to reflect in detail on what has happened to them and how it might impact who they are[87]. Furthermore, much of adolescent identity development now happens online, where adolescents explore and discover multiple aspects of their self-concept and present that emerging identity to their peers for feedback[88].

Mental health awareness materials disseminated online often encourage adolescents to identify symptoms of mental disorders in themselves[89]. A psychiatric diagnosis from a professional can have substantial positive (increasing self-understanding and self-legitimization) and negative (increasing self-stigma and a sense of isolation from others) impacts on adolescents' identity and self-concept[90]. When adolescents view online content about mental health problems, they are likely to take on this language to describe themselves, and it might be meaningfully absorbed into their developing identity[33]. This process of taking on language to describe themselves and absorbing it into their identity might have positive effects, such as improved self-understanding, access to resources and help-seeking[55,91]. However, academic, clinical and educational psychologists have theorized that the availability of mental health content online can also promote the identity of an 'unwell persona'

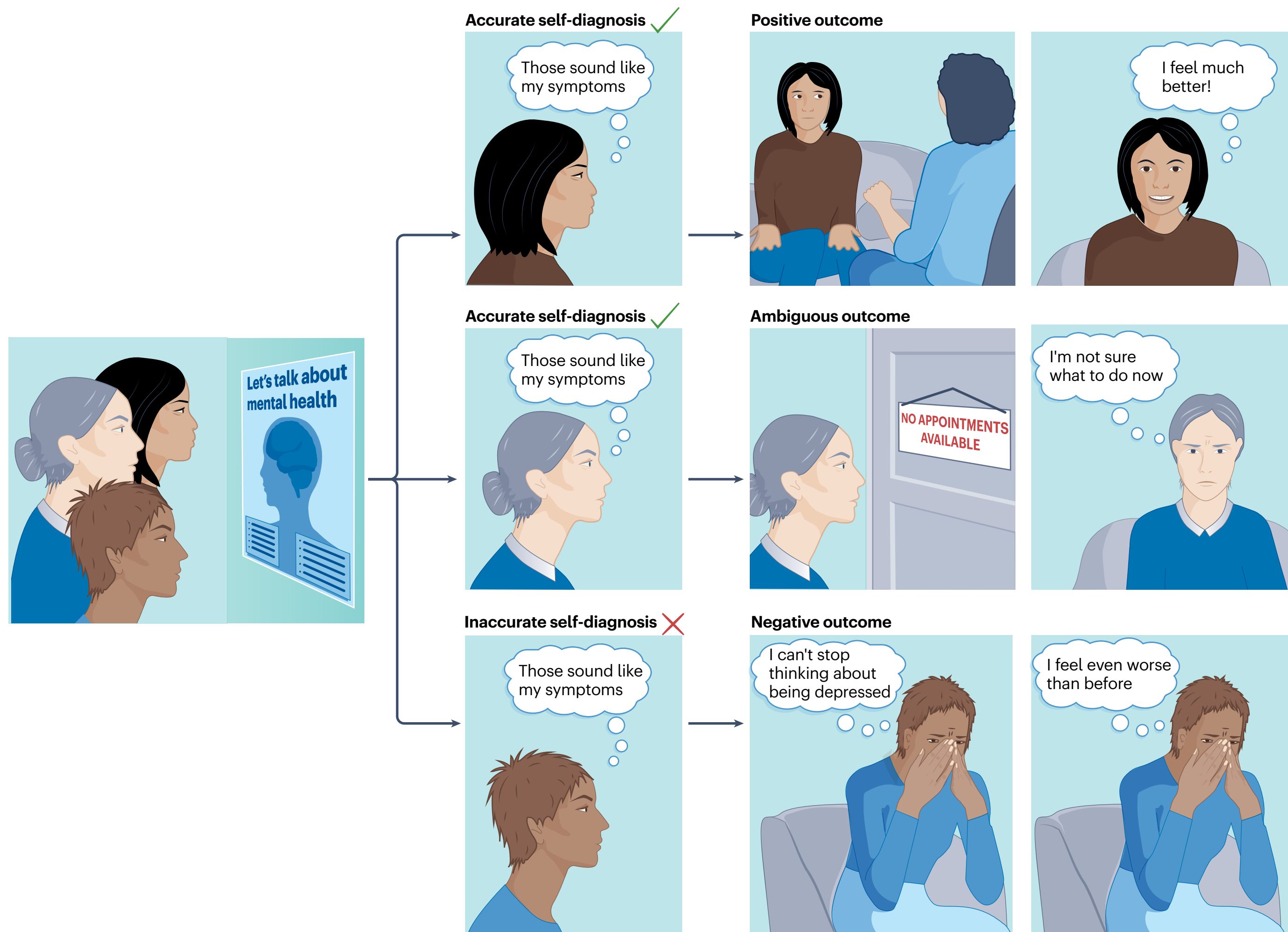

Fig. 1 | Possible impacts of mental health awareness campaigns. Mental health awareness campaigns might have different impacts for different individuals. For example, one person might recognize her symptoms in the campaign, realize she has depression, and seek help that resolves her symptoms (positive outcome). A second person might recognize her symptoms in the campaign, realize she has depression, but be unable to access an appointment with a doctor (ambiguous outcome). A third person experiencing low mood but who does not have depression might inaccurately conclude that she has depression; this inaccurate self-diagnosis could exacerbate symptoms or reduce her sense of agency in improving her mood (negative outcome).

for young people in distress, in which young people rely on diagnostic frameworks to understand themselves and their difficulties, and to communicate these with others[56,89,92].

Second, adolescence is a period of particular interest for mental health awareness efforts because this period is one of heightened risk for mental health problems[93]. Even adolescents who do not have a disorder experience frequent fluctuations in mood, have difficulty regulating their emotions and regularly experience stressful events, particularly academic stress and social stress relating to their family and peers[94–96]. In the context of mental health awareness efforts, adolescents might interpret and label these negative experiences as symptomatic of a mental health problem or disorder. In many cases, they do so accurately[60], but there are concerns that some adolescents might be mislabelling typical developmental stress as a mental disorder[35,62].

Finally, the impact of mental health awareness efforts should be considered in the context of adolescents' susceptibility to social influence. Adolescents are more susceptible to being influenced by their peers than are children and adults[97,98]. There is also some evidence for social contagion of mental disorder diagnoses among adolescents: a study of over 700,000 young people found that having a classmate diagnosed with a mental disorder in the ninth grade was associated with a higher risk of others within that class receiving a diagnosis later in life, relative to young people who did not have a classmate diagnosed with a mental disorder in ninth grade[99]. These effects held even when controlling for a number of parental, school-level and geographical factors. The mechanisms behind this finding are unclear, but they raise the possibility that mental disorder symptoms might be transmissible among adolescent peer networks, or that exposure to diagnostic labels might make people more willing to identify with and seek out diagnoses than individuals who were not exposed to these labels.

Any impact of mental health awareness efforts — whether positive or negative — should be considered in the context of all these

developmental vulnerabilities, which suggest that adolescents might be especially likely to be influenced by mental health awareness efforts. Moreover, this age group is the target of mental health awareness efforts in schools; there is therefore an ethical impetus to understand the impact of mental health awareness efforts on adolescents because they are exposed to mental health awareness in various contexts and often cannot easily opt out of receiving these interventions[48]. However, so far, there is a surprising paucity of empirical evidence assessing the impact of mental health awareness efforts on outcomes in adolescents specifically.

Summary and future directions

The reviewed studies demonstrate that mental health awareness materials can have a range of psychological effects on individuals, including how they interpret their own symptoms[64–66,72,73] and their beliefs about mental health and illness more generally[71]. Furthermore, specific effects vary depending on the individual's traits, the materials or messages being presented, and the social affiliation the individual feels with the person or account sharing the message[64,74,79,100]. Finally, there is evidence that receiving bogus personalized information about one's own symptoms – which is similar to some mental health awareness messages – can increase anxiety[101–104] and other symptom reporting[105,106]. Overall, these studies offer some tentative support for theoretical concerns that information about mental health can impact how individuals interpret, label and respond to their negative psychological experiences in a problematic way[7,12,21,54,107–110].

However, there are a number of methodological issues across these studies, and so the findings should be interpreted with caution. In particular, some of the evidence to date is essentially evidence of a manipulation check: participants repeated back the information presented to them (for example, that mental health disorders are common), possibly owing to transient demand characteristics and the desire to be a 'good participant'[111–114]. To assess whether this is the case or whether awareness materials lead to genuine belief change, study protocols should be designed to minimize demand characteristics (for example, emphasize anonymity and use filler tasks to mask the focus of the study) and follow-up data should be collected to examine whether belief change is transient or sustained.

Admittedly, this Review is based on a limited body of research and more work is needed, especially given the range of different messages that are delivered in mental health awareness campaigns, of contexts in which they are delivered, and of disorders and symptoms that are covered[115,116]. Once more studies are conducted, the field would benefit from a systematic review and meta-analysis. In the meantime, research using experimental methodology should use a systematic approach to manipulate different variables (for example, the message shared and the disorder described), examine their impact on different psychological outcomes, and test the role of various individual differences as moderators. Similarly, messenger effects should be examined systematically in experiments that manipulate variables that have been found to moderate social influence in other contexts, such as the perceived authority and likeability of the social media account posting the awareness content, as well as the similarity between the poster and the viewer[76].

It will also be important for future research to adopt longitudinal and ecologically valid designs. Experimental paradigms are helpful for testing specific hypotheses in a controlled manner, but they do not reflect the reality of how people are exposed to mental health awareness efforts in their daily lives[117]. These materials are widespread and are disseminated to people repeatedly across multiple contexts, including in schools, universities and workplaces and on social media. If psychological effects arise even after short-term exposure in laboratory settings, it is plausible that repeated exposure in daily life will have a greater impact on how individuals understand and report on their mental health. Future studies that can capture this repeated exposure (for example, using experience sampling methods) could address this hypothesis. Such approaches will be particularly important for testing whether exposure to mental health awareness materials can lead to a genuine increase in symptoms over time via a self-fulfilling mechanism, as suggested by the prevalence inflation hypothesis[7,54].

It will be critical for future research to use large enough sample sizes to examine individual differences. Sample sizes in the reviewed studies ranged from 60 to over 600 participants; not all studies were sufficiently powered. Critically, sample sizes were typically too small to consider individual differences. The goal of many mental health awareness efforts is to target people en masse, but the experimental evidence presented here indicates that not everyone will respond to the same message in the same way. For example, research on school-based mental health interventions suggests that young people with more mental health symptoms might be more negatively impacted by the intervention[118,119]. However, the possibility and nature of individual differences needs to be investigated in the context of mental health awareness efforts. It is also possible that age influences responses

Box 3 | Ethnic and cultural differences

Mental health literacy in low- and middle-income countries is low, as demonstrated by limited recognition and knowledge about mental health problems and illnesses, high levels of stigma and low confidence in seeking professional help, which often is not available[134,135]. It is therefore possible that awareness materials will have a different impact in these settings. Specifically, awareness materials might have more beneficial psychological impacts (for example, increased help-seeking) in countries where public stigma is high compared to countries where public stigma is comparatively low because they provide a much-needed correction to dominant negative attitudes. There might be an optimal level of mental health literacy or stigma at which mental health awareness interventions are likely to lead to the most benefit and the least harm; this needs to be investigated systematically in future research in a wide range of settings[136].

There is also reason to expect ethnic and cultural differences within high-income countries such as the UK and the USA that could moderate the psychological impact of mental health awareness materials. An individual's ethnicity and cultural background impacts their beliefs about the cause and treatments of mental health problems, the level of stigma and self-stigma they face, and their perception of and experience with accessing healthcare[137]. Specifically, individuals from minoritized ethnic groups experience higher levels of stigma[138], which probably combines with structural racism and stigma within healthcare to exacerbate poor mental health outcomes[139]. Future research on the impact of mental health awareness materials should examine the potential moderating role of ethnicity, and the underlying mechanisms including stigma and structural racism in healthcare.

to awareness materials; although most theoretical concern is targeted towards young people, there has been no attempt to compare whether different age groups are differentially impacted by mental health information.

Moreover, the majority of empirical research about mental health awareness has been conducted in high-income Western countries, with no evaluation of possible cultural differences within those populations. Testing the impact of awareness materials in low- and middle-income countries and cultural differences within high-income countries is a key avenue for future research (Box 3).

Once a better evidence base has been established, crucial questions must be asked on a societal level about the trade-off between the potential benefits of mental health awareness efforts (such as reduced stigma, increased help-seeking and improved ability to accurately recognize symptoms) and their potential drawbacks and harms (such as overpathologizing and inaccurate self-diagnosis). To some degree, all public health efforts run the risk of some unintended harms; the question is whether there are sufficient benefits to tolerate the amount of risk[120–122]. It will be important to explore which specific methods can deliver useful mental health information while minimizing unintended harms. Providing nocebo education is one potential option to minimize unintended harms[67], but this approach needs to be tested further in different contexts.

In sum, the evidence presented in this Review indicates that mental health awareness materials impact the way individuals understand their mental health, sometimes in a problematic way; more research is urgently needed to better understand how to optimize the effectiveness of these materials while minimizing potential harm.

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Author contributions

L.F., I.W., C.G.H. and D.S. researched data for the article. L.F., C.G.H., J.L.A., M.I. and D.S. contributed substantially to discussion of the content. All authors wrote the article and reviewed and/or edited the manuscript before submission.

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