Mental Health Literacy of ADHD, Autism, Schizophrenia, and Bipolar Disorder: A Cross-Cultural Investigation

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Background: Mental health literacy (MHL) is linked to help-seeking behaviours. Although lay people are not always well aware of mental health conditions, few international campaigns and interventions have been developed to raise awareness across cultures. **Aims:** To investigate MHL cross-culturally and to identify factors that are associated with MHL. **Method:** Using an online survey, 506 participants (103 Greek, 108 UK, 146 USA, 149 other nationality) read and labelled five vignettes of individuals with Autism, ADHD, Schizophrenia, Bipolar disorder and a healthy control. Factors influencing response, confidence and accuracy were compared across all participants, and the effect of various demographics on accurate labelling was compared between countries. **Results:** Recognition rates were higher than in previous investigations: 75.5% of participants recognised the Healthy vignette, 71.1% ADHD, 61.7% Autism, 56.6% Schizophrenia, 31.6% Bipolar. MHL varied across different countries, with religion, language spoken, and education having the greatest effects. Personal experience of mental illness partially affected MHL. **Conclusions:** MHL is relatively high for some mental health conditions, but public knowledge of other conditions is still poor. Factors influencing MHL vary across countries.

Introduction

According to the World Health Organisation (WHO), over a third of people meet the criteria for a mental health or neurodevelopmental condition at some point in their lives (Demyttenaere, Bruffaerts, Posada-Villa, Gasquet, Kovess, & Lepine, 2004). Although the public is aware of the benefits of being literate about physical diseases, knowledge about mental health has been greatly neglected (Furnham, 2009).

The term "mental health literacy" was first introduced by Jorm and colleagues (1997), who defined it as the "knowledge and beliefs about mental disorders, which aid their recognition, management or prevention" (p.182). They identified six components of MHL: "(a) the ability to recognise specific disorders or different types of psychological distress; (b) knowledge and beliefs about risk factors and causes; (c) knowledge and beliefs about self-help interventions; (d) knowledge and beliefs about professional help available; (e) attitudes which enhance recognition and appropriate help-seeking; and (f) knowledge of how to seek mental health information".

Mental Health Literacy Among Lay People

Many studies have explored the extent of MHL among lay people. One pioneering study by Jorm et al. (1997) found 72-84% of participants recognised mental health difficulties in vignettes, but only 27-39% accurately identified the correct mental health condition (schizophrenia and depression respectively) in each case.

Several follow-up investigations found variation in literacy across different mental health conditions. Recognition of depression was found to be higher than psychosis in Pakistani participants (Suhail, 2005), while a Japanese study found low recognition of schizophrenia (Sawamura et al., 2012). Although familiarity of mental health conditions such as schizophrenia, autism, or attention deficit hyperactivity disorder (ADHD) may be self-reported as relatively high, self-reported interaction with people with these symptoms is much lower (Furnham, Cook, Martin & Batey, 2011). Having heard of a condition does not mean that it is understood or can be recognised. Mental health literacy is therefore important even when initial recognition of mental health conditions appears relatively high.

Several longitudinal studies have also demonstrated that MHL has improved over the years. Recognition of and openness to help-seeking for mental health conditions has generally improved over time (Goldney, Fisher, DalGrande & Taylor, 2005; Jorm,

Christensen & Griffiths, 2006; Paykel, Halt & Priest, 1998). One explanation for this is the role of public MHL campaigns, which promote alignment between public beliefs and professional conceptions of mental health (Jorm, Christensen, & Griffiths, 2006; Reavely & Jorm, 2012). However, the majority of investigations have been conducted in Western countries, such as Australia, the United Kingdom, Germany, and the United States, which suggests a need to examine current MHL across other cultures.

Additionally, available information can often be misleading. Griffiths and Christensen (2000) found that websites offering information about depression scored poorly on guidelines for clinical practice quality. Lay people who seek information about mental health conditions may find themselves misinformed, and so appear less literate than they think they are.

Factors Influencing Mental Health Literacy

Many studies have found that females are more informed about mental health than males and that males are more likely to endorse the use of alcohol to deal with mental health problems (Chong, Vaingankar, Abdin, & Subramaniam, 2012; Koyama et al., 2009). However, some studies have found no gender differences in MHL (O'Keeffe et al., 2016; Lawlor et al., 2008).

Personal experience of a mental health condition is considered an amplificatory factor. A British study found that 33% of participants listed personal connections as their main information source on mental health (Wolff, Pathare, Craig, & Leff, 1996). Indeed, interacting with someone with mental health problems or struggling personally with mental health has been linked to better mental health awareness (Furnham et al., 2011; Hillert et al., 1999).

Age is an ambiguous factor with few consistent results. However, most investigations agree that adolescents are less likely to correctly identify mental health conditions (O'Keeffe et al., 2016; Wright et al., 2005) and that young adults have more accurate knowledge than elderly people, over 60 years old (Farrer et al., 2008; Fisher, & Goldney, 2003; Leong & Zachar, 1999).

Lower levels of education have also been associated with lower identification rates (Chong et al., 2012; Suhail 2005). It is not yet known whether attending a public or private school, or studying mental health-relevant subjects, affect MHL. Other factors, which to our knowledge have not yet been examined in relation to MHL, include religion,

living abroad, and language spoken, which may be related to access to information and cultural attitudes to mental health.

Cross-Cultural Investigations

Although research on MHL has been conducted in many countries, very few investigations have been conducted on a cross-cultural level. This is important because cultural influences on the definition of mental health conditions can cause cultural specificity (Furnham & Winceslaus, 2011; Furnham, Raja, & Khan, 2008). Waxler (1974) argued that societies do not cause different rates of mental ill-health; instead they respond differently to illness once it occurs. Those differences may account for variations in mental health occurrence and outcomes, and could explain how societies shape the mentally ill to match societal expectations. In return, these variations produced among societies could account for cross-cultural differences in recognized standardized symptoms of a mental health condition. Alegria et al. (1991) added the certain cultures may simply be more accepting of some psychiatric symptoms. For instance, Weisz and Weiss (1991) found intercultural differences in parents' "distress thresholds" regarding their child's mental health problems. In this case culture may have played a role in defining a problem as mental health related or not (Cauce et al, 2002). In a study regarding mental health problems and help-seeking in Middle Eastern countries, Al Krenawi, Graham, Al-Bedah, Kadri and Sehwail (2008) found that nationality together with gender and education level were the main predictors for recognition of personal need, beliefs about mental health problems, such as stigmatization, and the use of traditional healing methods over modern psychiatric therapy. Moreover, in a cross-cultural study by Sheikh and Furnham (2000), for British Asians and Pakistanis casual attributions of mental distress contributed towards seeking professional support for psychological problems, which was not the case for Western Europeans. This means that the culturally conceptualized features and symptoms of mental health problems may influence help-seeking behaviours.

Overall, cross-cultural differences towards mental health problems have been identified mainly in comparisons between the east and west. However, European countries do not share cultural features such as language, religion, geography (Ronen & Shenkar, 1985), technological development (Webber, 1969), world view, alternative healing resources, values of interdependence, collected kinship, structure, family support,

and professionals' willingness to work collaboratively with families (Lefley, 1990). For instance, Mediterranean countries of Southern Europe have been found to form closer parent-child ties (Giuliano, 2007), be more physically affectionate (Singh, McKay & Singh, 1998), and have poorer employment opportunities (Ghidoni, 2002), in comparison to Northern European or Asian cultures. Certain countries, such as the US and UK, have introduced national campaigns to improve MHL (e.g. Paykel, Halt & Priest, 1998; Regier et al., 1988). In contrast, WHO (2008) reported no existing governmental initiatives for reviewing mental health services or tackling mental health-related stigma in Greece, as just one example (pp. 145-147; Tables 10.2, 10.3).

Present Study

The present study aimed to investigate MHL cross-culturally and identify associated factors. Three unique cultures with different approaches to mental health care were targeted based on the researchers' personal networks and languages, and compared to participants from other countries more broadly: the United Kingdom (English-speaking free-at-the-point-of-service healthcare), the United States (English-speaking insurance-based healthcare), and Greece (non-English-speaking insurance-based healthcare). Due to disparities in mental health provision and attitudes to mental health between the US, the UK, and Greece, the present study focuses on these three countries in contrast to a broader international sample.

MHL of four mental health and neurodevelopmental conditions (ADHD, Autism, Schizophrenia, and Bipolar Disorder) was assessed. These conditions were chosen based on the Furnham and colleagues (2011) study, in which all these conditions were recognized by minimum 70% of the sample. In addition, the prevalence of these four conditions is high across the world. A recent review of 175 studies on ADHD found a prevalence of 7.2%, which corresponds to approximately 129 million children across the world (Thomas, Sanders, Doust, Beller, & Glasziou, 2015). Also, according to WHO, one in 160 children are diagnosed with autistic spectrum disorder, while 60 million people have bipolar disorder and 21 million have schizophrenia around the world (WHO, 2016).

The following three hypotheses were tested in this study:

1. Perceived knowledge (*Do you consider yourself literate about mental health? Yes/ Somewhat/ No*) will be rated as greater than actual knowledge (recognition accuracy).

2. British and American participants will outperform Greek participants.

3. Individuals with personal experience of mental health conditions (e.g. being diagnosed with a mental disorder yourself or knowing someone who has) will perform significantly better than those without any personal experience.

Research questions were also advanced without specific hypotheses.

1. Which other factors are related to participants' mental health accuracy across the entire sample?

2. Which other factors are related to participants' mental health accuracy in each country?

Method

Participants

Participants were 506 volunteers identified through various websites, including the institution's subject pool, as well as social media. University students who took part through the university subject pool received course credit for their participation.

The sample consisted of 178 males, 312 females and 16 people who preferred not to disclose their gender with an age range of 18-62 years (*M*=24.13, *SD*=8.09). Participants were divided in four 'country categories' based on the countries they were born and raised in. Table 1 shows the demographics of gender and age for each country category.

A group labelled 'Other' included individuals from 52 countries, in which 39 participants from Canada and 18 from Australia formed the two biggest subgroups.

Most participants self-identified as Caucasian (*N*=428), 37 as Asian, 25 as Mixed, four as Black and 12 as 'Other'. Participants self-identified as follows: 234 Atheist, 150 Christian, 87 Other Religion, 16 Muslim, nine Buddhist, seven Jewish, and three Hindu.

[INSERT TABLE 1 HERE]

Two hundred and sixteen participants reported having been personally diagnosed with a mental health disorder. When asked to indicate which one(s), there was high co-occurrence. The reported conditions included the following: 142 Depression, 107 Anxiety, 41 ADHD, 9 Eating Disorders, 9 Borderline Personality Disorder, 2 Narcissistic Disorder, 2 Avoidant Personality Disorder and 1 Schizophrenia.

The UCL Institutional Ethics Committee granted ethical approval for this study(ID CEHP/EP/2016/0004) and participant informed consent was obtained in all cases.

Materials, Stimuli & Design

Materials for this study were based on the methods used by Jorm et al. (1997), updated to meet current diagnostic criteria for each condition, and administered via Qualtrics, an online survey hosting site.

Participants were presented with five vignettes, one describing a healthy individual and four with mental health or neurodevelopmental conditions (Autism, ADHD, Schizophrenia and Bipolar Disorder; see Appendix I). They were based on fictional characters and were between 180-200 words each. All five vignettes were written and checked by two independent researchers. The healthy individual vignette was used as a control and was designed to describe a balanced person with both positive and negative traits and experiences. The other four vignettes were developed based on DSM-V symptoms and diagnostic criteria for each condition. In the case of ADHD, which includes both Attention Deficit Disorder and Hyperactivity Disorder subtypes, the criteria for the latter were used. Each text included as many symptoms as would be needed for an individual to be diagnosed with the specific condition by a professional.

Following each vignette, there were four questions, adapted from Jorm et al. (1997): "Do you think [name] has a mental health condition?", "What would you say, if anything, is wrong with [name]?", "How confident are you about your diagnosis?" and "Do you think [name] should ask for professional help?". If participants answered "Yes" or "Maybe" to the first question, they were then presented with the second and the third ones. Confidence was measured using a 1 (*not at all confident*) to 10 (*very confident*) Likert scale. If participants thought the individual had no mental health condition, they were presented only with the last question.

The order of the vignettes was randomised to avoid priming effects. All participants were presented with all five vignettes.

Participants could choose to answer the survey in English or Greek. A professional translator asssisted in the Greek translation of the survey in order to maintain the terminological accuracy as well as the length and content of each vignette and the overall questionnaire.

Procedure

Participants read an information sheet and gave their informed consent to take part in the study. They were informed that they would read "*short descriptions of mentally healthy individuals or others suffering from different mental health conditions*" and would have to name the condition. They were also told that there were no right or wrong answers.

Participants completed demographic questions and were then presented with the five vignettes in a random order. Following the vignettes, there were 11 questions about their views and experiences of mental health (see Appendix II). Lastly, participants were debriefed and provided with links for psychological services in case there was any feeling of distress after completing the survey.

Statistical Analysis

Hypothesis 1 was tested through two Univariate ANOVAs, one comparing participants' accuracy and confidence in their answers, and one comparing accuracy and self-reported MHL.

Hypothesis 2, Hypothesis 3, and Research Question 1 were tested through a univariate ANOVA comparing accuracy across all twelve predictor variables in the total sample.

Research Question 2 was tested through four univariate ANOVAs comparing accuracy across eleven predictor variables in each country category separately.

Coding

Before the statistical analysis of the data, participants' free input text responses to each vignette were coded for comparison. Correctly named conditions were given one point and completely incorrect ones, zero points. Answers that included two conditions, with one being correct (e.g. 'borderline personality disorder/schizophrenia' for the schizophrenia vignette) were considered partially correct and were given half a point (0.5). However, answers of 'psychosis/schizophrenia' were marked as correct for the schizophrenia vignette, following Jorm et al., (1997) and answers of 'manic depression' or 'mania/bipolar' were marked as correct for the bipolar vignette, as the latter are previous names for the same condition. Consequently, an overall accuracy score was counted as the average of the five labels, ranging from zero to five with the possibility of half points (0.5, 1.5, 2.5, 3.5, 4.5).

Results

Accuracy

Most participants correctly labelled the majority of the vignettes. Specifically, 75.5% identified the healthy individual, 71.3% ADHD, 61.7% autism, 64.4% schizophrenia, while only 34.6% of participants identified bipolar disorder correctly. Most "partially correct" responses concerned the schizophrenia vignette, where people used multiple responses including the correct one 62/506 times (12.3%; see Figure 1). In the partially correct or wrong answers, several responses were highly common. For example, 87 participants thought that the healthy individual suffered from a disorder suggested. Similarly, participants suggested OCD (n = 90) instead of autism, while misclassifying schizophrenia as paranoia (n = 62). In the case of bipolar disorder there was no consistently proposed alternative, but responses included narcissistic personality disorder (n = 35), mania (n = 34), and depression (n = 24).

Participants were also asked whether they thought the person described in the vignette had a mental health condition. Recognition of a condition's presence was not proportional to the condition's labelling accuracy. Thus, even though the majority still argued that the individuals with Autism (77.1%) and Schizophrenia (90.3%) had a mental health disorder, only 46% in the ADHD vignette and 54.5% in the bipolar disorder vignette thought so (see Figure 2).

Confidence

There were two questions reflecting confidence: "How confident are you about your diagnosis?" (asked after each vignette) and "Do you consider yourself literate about mental health disorders/conditions?". A significant relationship was found between accuracy and self-reported confidence across all five vignettes combined $F(80, 425) = 2.43, p < .000, \eta^2_p = .313$. Those who correctly labelled the vignettes were more confident about their responses than those who responded incorrectly. Additionally, a one-way ANOVA found a significant effect of how literate people believed they were $F(2, 503) = 37.39, p < .001, \eta^2_p = .129$. Those who self-reported greater MHL had higher overall accuracy, suggesting overall accurate assessment of MHL. Post-hoc analysis between all possible pairs using Tukey tests determined all three pairs significantly different ($p < .001$), meaning that those who responded "Yes" ($M = 3.79, SD = 1.15$) performed

significantly better than those who responded "Somewhat" ($M = 3.16$, $SD = 1.28$), who, in turn, outperformed those who responded "No" ($M = 2.10$, $SD = 1.16$) (see Figure 3).

Factors affecting Accuracy (Between Country)

The first Univariate ANOVA was conducted on the overall sample, examining the effect of twelve factors on accuracy $F(30, 475) = 12.58$, $p < .001$, $\eta^2_p = .443$. These included country, gender, age, educational attainment, religion, school type, number of languages spoken, having lived abroad, having been personally diagnosed with a mental disorder, knowing someone who has been diagnosed, having had sessions with a mental health professional and having studied a relevant degree (see Table 2).

[INSERT TABLE 2 HERE]

In examination of the second hypothesis, country was found to be a significant factor affecting accuracy $F(3, 475) = 33.75$, $p < .001$, $\eta^2_p = .176$. The four country categories consisted of Greece ($M = 1.84$, $SD = 1.06$), UK ($M = 3.46$, $SD = 1.04$), USA ($M = 3.86$, $SD = 1.03$) and Other ($M = 3.43$, $SD = 1.22$). Post-hoc Tukey tests were conducted, which identified significant differences in accuracy ($p < .001$) between Greek participants and each of the other groups individually. In addition, American participants were more accurate than those in the UK ($p = .010$) and the "Other" categories ($p = .002$; Figure 4).

In a test of the third hypothesis, knowing someone who has been diagnosed with a mental condition enhanced performance on the labelling task $F(2, 475) = 6.26$, $p = .002$, $\eta^2_p = .026$. Participants who responded positively to this question had a higher mean accuracy ($M = 3.37$, $SD = 1.26$) than those who did not ($M = 2.42$, $SD = 1.33$). However, having been personally diagnosed with a mental disorder did not significantly influence MHL $F(2,475) = 1.50$, $p = .225$.

The first research question focused on other factors which may affect accuracy of MHL.

There was a significant gender effect $F(2, 475) = 4.96$, $p = .007$, $\eta^2_p = .020$ among males ($M = 3.01$, $SD = 1.26$), females ($M = 3.33$, $SD = 1.34$) and those who preferred not to disclose their gender ($M = 3.75$, $SD = 0.91$). Post-hoc analysis identified a significant difference between males and females ($p = .003$) as well as males and the undisclosed group ($p = .005$).

Higher educational attainment also had a significant effect on accuracy $F(2,475) = 5.02$, $p = .007$, $\eta^2_p = .021$. Participants with a high-school diploma achieved the lowest mean ($M = 3.09$, $SD = 1.30$), followed by those holding an undergraduate degree ($M =$

3.39, SD = 1.40) and then those who had completed postgraduate studies (M = 3.55, SD = 1.12). Tukey post-hoc analysis revealed a significant difference between high-school diploma and both undergraduate (p = .009) as well as post-graduate degree (p = .003) holders.

Age group, school type, holding a degree in a field relevant to mental health, having been personally diagnosed and having visited a MH professional did not influence participants' performance on this MHL task in the overall analysis.

Factors affecting Accuracy (Within-Country)

The second research question tested the main effects of factors possibly affecting MHL separately within each country category (UK, USA, Greece, Other). Four Univariate ANOVAs were performed, one for each category, with twelve independent variables and one dependent variable (accuracy; see Table 2).

For the 103 Greek participants, three factors reached significance. Speaking multiple languages had the greatest effect on accuracy.

For British participants religion played a significant role, with Muslims significantly underperforming over Christians (p = .009), atheists (p = .022) and people who did not identify with one of the major religions listed (p = .003).

University level education and not having lived abroad positively influenced accuracy scores for participants from the USA.

Lastly, for participants from 'Other' countries, knowing someone with a mental health diagnosis and having personally been diagnosed were significant factors for better performance.

Discussion

This study aimed to investigate mental health literacy (MHL) in lay people cross-culturally and to identify factors related to variation in MHL.

Overall, four out of the five vignettes were correctly labelled by the majority of participants with the exception of the vignette describing bipolar disorder, where only one third identified and named the problem correctly. Participants' confidence was reflected in their responses; correct answers were mostly generated by those with greater confidence both in their labelling and in their general knowledge about mental health. Moreover, there were significant cross-cultural differences, with USA participants performing best, followed by UK and "Other" nationals, while Greek participants

performed poorest. Country, religion, and the number of languages spoken had the greatest impact on accuracy in the total sample. Different factors appear to affect accuracy in each country category.

Labelling and Recognition Rates

Recognition rates in this study were higher than those reported in previous studies, (e.g. Jorm et al. 1997; Suhail, 2005; Sawamura et al., 2012). In four out of five vignettes, recognition rate was over 50%. However, bipolar disorder was accurately recognised by only a third of participants. Previous investigations have been limited in the conditions they included and there has been little media exposure of bipolar disorder, amongst other conditions. The general public may, therefore, be less exposed to information about bipolar disorder than the other conditions.

The fact that the healthy individual was frequently labelled as depressed could be attributed to priming effects. Participants may have expected all behaviours to be related to mental health problems and so placed more emphasis on the negative characteristics described. In the case of conditions like autism, which was often misidentified as OCD, this could be explained by the overlapping characteristics between conditions (in this case, compulsion and obsessive tendencies). The fact that many participants responded with multiple answers to the labelling task may reflect the real-life co-occurrence of many conditions.

Confidence

The first hypothesis, which predicted that people would overestimate their performance based on how literate they consider themselves to be about mental health, was not supported. Participants in this study showed a good awareness of their own knowledge of mental conditions; those who considered themselves as mental health literate performed significantly better than those who did not.

Between- and Within- Country Differences

The analysis revealed significant between-country differences, with Greek participants performing worse than the rest of the sample, in support of the second hypothesis. This could be because information about mental health is not as widely available in Greece compared to the UK and USA, where there are frequent campaigns

to raise mental health awareness (e.g. Pavkel, Halt & Priest, 1998; Regier et al., 1988), which in turn may have resulted in greater baseline MHL in these populations.

The within-country analysis revealed varying factors influencing recognition levels among each country. For Greek participants, speaking multiple languages had the largest effect on MHL. In a country that does not generally promote information about mental health, multilingual individuals may have more access to information from external sources, than monolinguals. Higher education, and education in a relevant field, also increased MHL.

Religion was a significant factor for participants from the UK, with Muslim participants performing less well than individuals from other or no religions. In accordance with Sheikh and Furnham (2000), minorities may have differentiated attributions about mental distress influence their recognition level of mental health disorders. Religious and ethnic group differences in attitudes to mental health, as well as accessibility of public-health campaigns, may influence MHL in these cases, and these findings suggest specific groups to target in the future.

In the USA, higher education was positively related to performance. As in Greece, greater levels of education may give individuals in the US the tools to access more accurate information about mental health, perhaps through university or extra-curricular events.

Looking back to evidence mentioned in the introduction, different cultures may recognize specific behaviours as symptomatic or not based on societal expectations (Cause et al., 2002). This case, Greek participants may not identify symptoms in the vignette as problematic behavior, but rather attribute them to personality traits, which may differ to non-Mediterranean cultures. This theory could also be supported by the close family ties of South European Mediterranean people (Giuliano, 2007), who may accept and normalize symptomatic behavior as part of the individual's personality rather than 'diagnose' problematic behavior in a relative, which could cause uncertainty in the family's trusting relationships.

Differences between Greece and the UK and US were found, as predicted based on the differences in cultural features, language, governmental initiatives regarding mental health services, family structure and values of interdependence (Lefley, 1990); Ronen & Shenkar, 1985; WHO, 2008). As described, there may be characteristics of each country which contribute to both attitudes towards mental health, and the ways in which it is

experienced and discussed – all of which may contribute to overall mental health accuracy.

Personal Experience

The third hypothesis predicted that individuals who had personally been diagnosed with a mental condition or who knew someone who had, would perform better than those without such personal experience. Our findings partially confirmed this hypothesis. Although knowing someone who suffers from a mental health condition predicted better performance, having been personally diagnosed with one did not. This contrasts with results from previous investigations such as Furnham, Kirbky and McClelland (2011), Hillert et al. (1999) and Wolff et al. (1996). It may be that the behavioural characteristics of some mental health conditions are easier to recognize in others than in oneself.

However, the finding that personal experience of mental health conditions and knowing someone with a mental health diagnosis were the only significant predictors of mental health accuracy in the 'Other' country sample suggests that these experiences may have an impact across multiple different cultures. While individual countries' mental health awareness campaigns and educational policies may influence citizens' MHL, personal experience may increase MHL regardless of nationality. Increasing discussion of mental health, and reducing stigma, so that people are more willing to share their own experiences of mental health difficulties, could be suggested as an aim of awareness campaigns around the world.

Limitations and Future Research

This study had several limitations. Firstly, the cultural variation of this study was limited as the major groups did not consist of any African, Latin American or Asian countries, for example. While there are likely to be greater differences between Greek and UK/US participants than between UK and US participants, most participants from the total sample were from English-speaking cultures. A broader cross-cultural comparison is an important target for larger research teams in the future.

Similarly, some of the comparison groups included in these analyses contained very small sample sizes. While the finding of some significant differences between groups (such as for gender, including non-binary genders) should still be considered robust in the context of these small samples, we acknowledge that some of our analyses were underpowered to detect small-to-moderate effects, as confirmed by post-hoc power

analyses. Conclusions regarding groups with smaller total numbers, such as different religious groups within and across countries, should therefore be reserved until adequately powered samples can be obtained.

Individuals described in the vignettes varied in age and gender, in order to reduce biases in perceptions of 'gendered' conditions such as autism. However, these factors may have an impact on the perception of the character in the vignette. Ideally multiple profiles should be used for each vignette to avoid misconceptions and biases.

As with most online, questionnaire-based research, ecological validity was lower than might be desired. Understanding a mental health condition from a short, descriptive text does not represent real-life human interactions. Wright, Jorm, Harris and McGorry (2007) have argued that ideas about help-seeking differ from actual behaviours. This is corroborated by the low uptake of mental health services and treatments amongst the general population (Jorm, 2012).

It is also possible that there was a self-selection bias, as the majority of participants in this study reported having been previously diagnosed with a mental health condition. These participants may have had greater mental health awareness than those in the population with no personal experience of mental health difficulties. Lastly, as not explored in this study, it would be recommended that in future research participants are asked whether they have been consciously exposed to a campaign about mental health. There was no record of whether participants were aware of mental health awareness campaigns in their countries of origin. Although the effects of campaigns and advertisements can often be subconsciously absorbed, it would be helpful to record whether individuals from varying countries remember being exposed to such efforts.

Conclusions

This is the first known study to compare MHL across the US, UK, and Greece, and suggests MHL is high for autism, ADHD, and schizophrenia. MHL of bipolar disorder was significantly lower than for the other conditions across all participants. Overall, MHL in Greece is lower than in the US and UK, suggesting a greater need for campaigns and interventions to improve knowledge of mental health in the general population. Successful strategies used in the US and UK could be expanded to other countries, resulting in improved awareness of mental health issues and increasing the likelihood that individuals at risk will seek help.

List of Abbreviations

MHL = Mental Health Literacy

WHO = World Health Organisation

Declarations

Ethics approval and consent to participate

This study was approved by UCL Ethics Committee. Project ID No: CEHP/EP/2016/004.

Informed consent was obtained from all participants before beginning the study.

Consent for publication

Not Applicable

Availability of data and material

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

Competing interests

The authors declare that they have no competing interests.

Authors' contributions

FV conceived of the study, collected data, and drafted the manuscript. FV and LH designed the study and conducted analyses. FV, LH, and KVP revised the manuscript. All authors read and approved the final manuscript.

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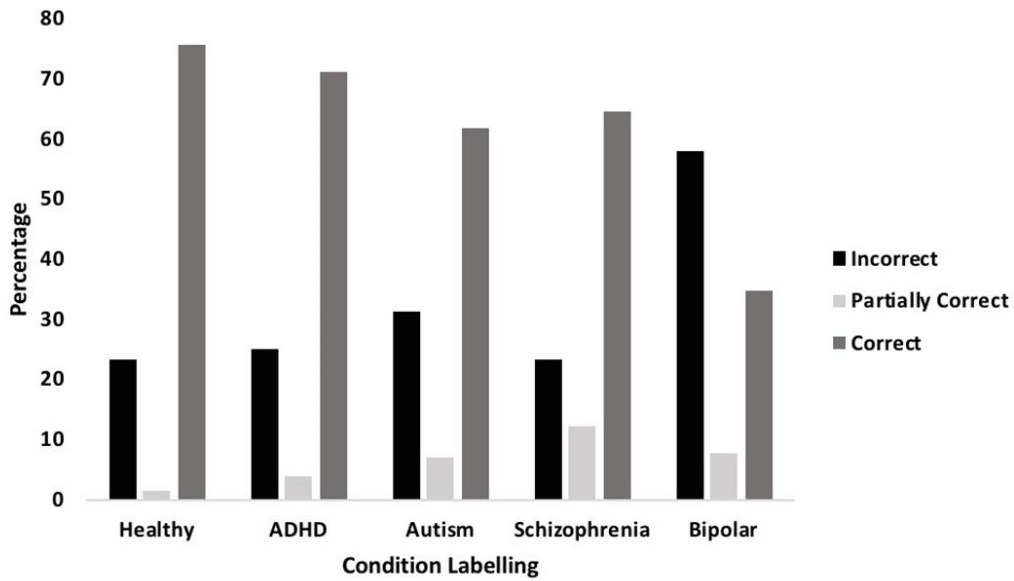
Figure 1. Percentage of points accredited to responses for each of the five vignettes.
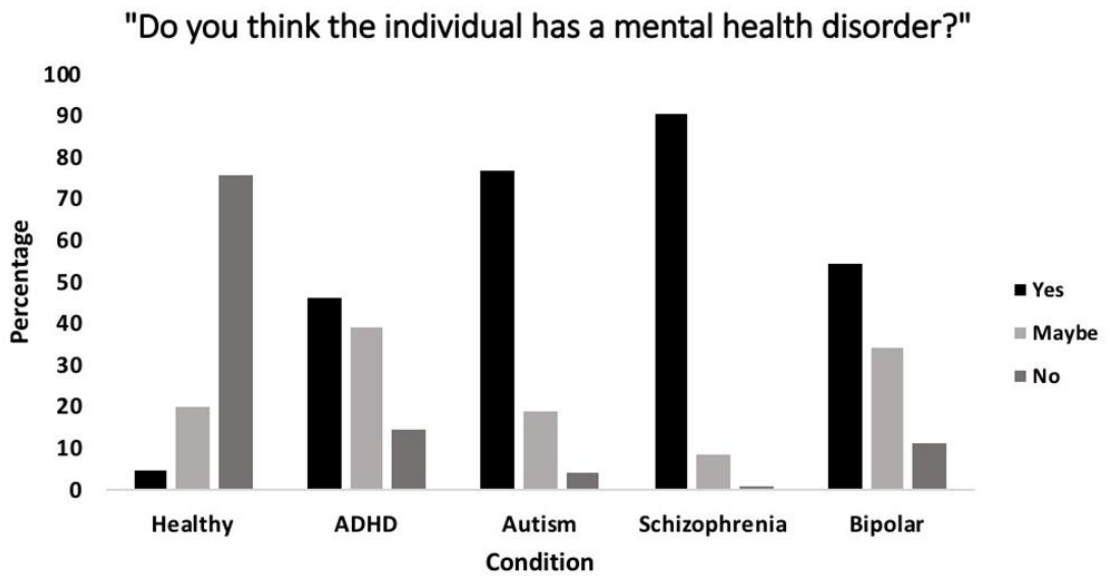

Figure 2. Percentage of participants choosing "Yes", "Maybe", and "No" for whether the individual in the vignette had a mental disorder across the five conditions.
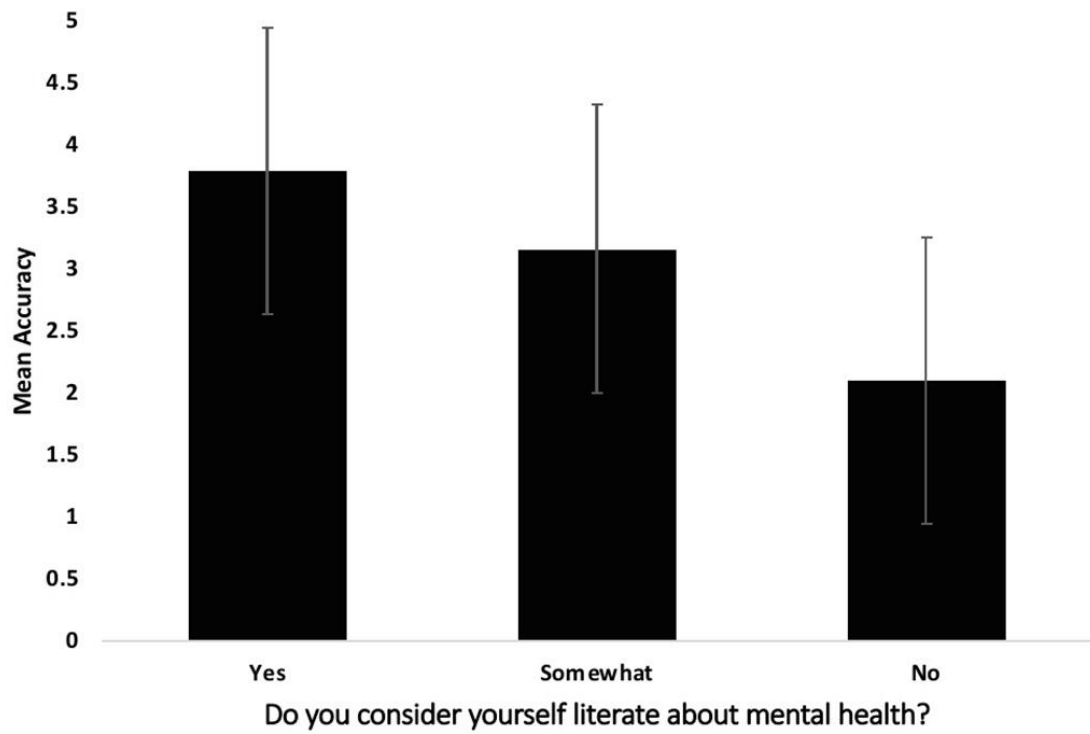
Figure 3. Mean accuracy for participants who consider themselves literate, somewhat literate and illiterate about mental health. Error bars represent the standard deviation.
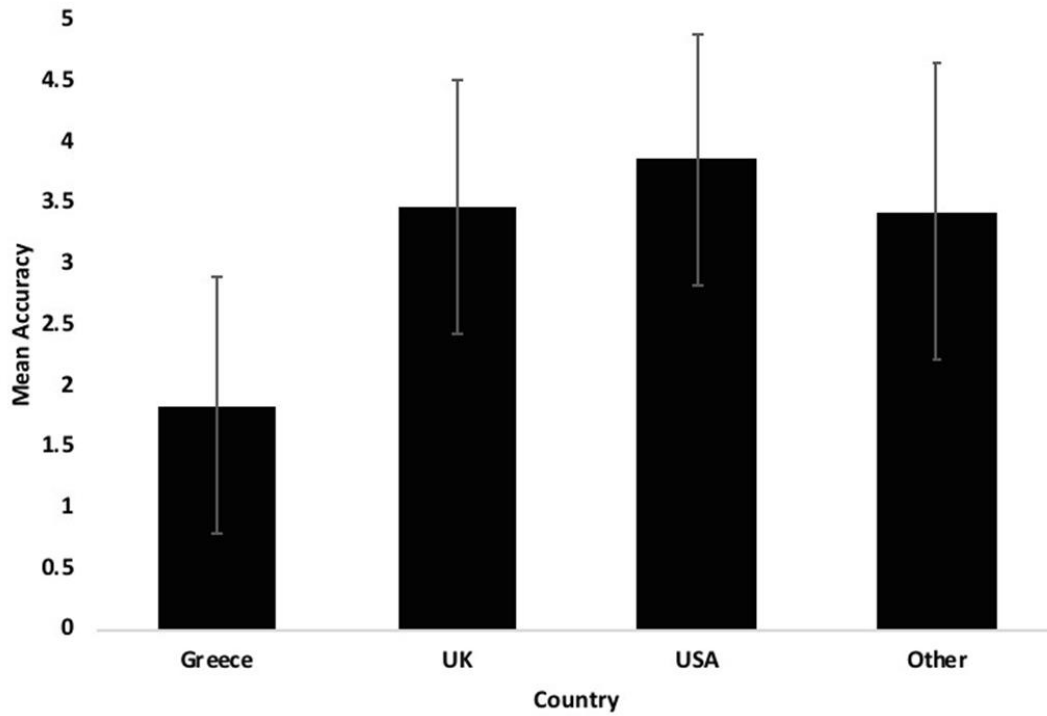
Figure 4. Mean accuracy among different country categories. Error bars represent the standard deviation.

Table 1. Gender Distribution, Mean Age and Standard Deviation for Each Country.

		Greece	UK	USA	Other	Total
Gender						
	Male	36	24	57	61	178
	Female	67	83	81	81	312
	Undisclosed	-	1	8	7	16
	Total	103	108	146	149	506
Mean Age		26.10	21.53	25.71	23.10	24.13
(SD)		(11.74)	(5.48)	(7.71)	(6.12)	(8.10)

Table 2. Univariate ANOVA Results (Total Sample and Between Country). Note that only significant variables are shown for Country-based analyses.

	df	F	p	η^2_p
Total Sample				
Corrected Model	30	12.580	.000	.443
Country	**3**	**33.754**	**.000**	**.176**
Gender	**2**	**4.964**	**.007**	**.020**
Age Group	4	1.621	.168	.013
Education	**2**	**5.023**	**.007**	**.021**
Religion	**6**	**3.500**	**.002**	**.042**
School Type	1	0.395	.540	.001
Number of Languages	**4**	**6.332**	**.000**	**.051**
Having Lived Abroad	**1**	**5.067**	**.025**	**.011**
Personal Diagnosis	2	1.495	.225	.006
Know Someone Diagnosed	**2**	**6.261**	**.002**	**.026**
Received Professional Help	2	.586	.557	.002
Relevant Degree	1	1.874	.172	.004
Error	475			
Greece				
Number of Languages	4	3.40	.013	.142
Education	2	3.13	.049	.071
Relevant Degree	1	6.81	.011	.077
Error	82			
UK				
Religion	5	2.79	.022	.147

Error	81			
USA				
Education	2	5.05	.008	.077
Having Lived Abroad	2	6.68	.011	.052
Error	121			
Other				
Personal Diagnosis	2	3.24	.043	.050
Know Someone Diagnosed	2	3.11	.048	.049
Error	122			