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Sex differences in beliefs and attitudes towards mental illness: An examination of mental health literacy in a community sample

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Objectives: The current study investigated mental health literacy in an Australian sample to examine the influence sex has in the identification of and attitudes towards various aspects of mental illness.

Method: An online questionnaire was completed by 373 participants (267 female, $M = 34.87$). Participants were randomly assigned a vignette depicting an individual exhibiting the symptoms of one of three types of mental illness and asked to answer questions relating to aspects of mental health literacy.

Results: Males exhibited poorer mental health literacy skills compared to females. Males were less likely to correctly identify the type of mental illness, more likely to rate symptoms as less serious and to perceive the individual as having greater personal control over such symptoms.

Conclusion: Generally, the sample was relatively proficient at correctly identifying mental illness but overall males displayed poorer mental health literacy skills than females.

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Sex differences in beliefs and attitudes towards mental illness: An examination of mental health literacy in a community sample

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Introduction

Mental illness is a predominant issue in public health, contributing to substantial economic and emotional community burden. It is estimated that up to 45% of the Australian population will experience mental illness at some point during their lifetime (Australian Bureau of Statistics [ABS], 2009). However, not all individuals who experience symptoms of mental illness receive the same level of care or treatment. This is partly attributable to the general public's beliefs and attitudes surrounding mental illness, often referred to as their mental health literacy (e.g., Jorm, Barney et al., 2006).

The term mental health literacy was first introduced in a study by Jorm et al. (1997) investigating public beliefs about the causes and risk factors for depression and schizophrenia. Jorm et al. (1997, p. 143) described a person's mental health literacy as his or her "knowledge and beliefs about mental disorders that aid the recognition, management or prevention of these disorders." According to Jorm et al. (1997), mental health literacy includes: (a) the ability to recognize and differentiate various types of mental illness and disorders; (b) knowledge of how and where to seek information about risk factors, intervention strategies, and professional help; and (c) attitudes and beliefs that influence a person's ability to identify mental illness and seek appropriate help. Furthermore, an individual's mental health literacy can be influenced by a multitude of factors, including age, remoteness of residency, education, socioeconomic status, and personal experience with mental healthcare (Dahlberg, Waern & Runeson, 2008; Farrer, Leach, Griffiths, Christensen & Jorm, 2008; Griffiths, Christensen & Jorm, 2009; Kaneko & Motohashi, 2007).

Studies have shown that the general public historically exhibit poor mental health literacy towards various aspects of mental illnesses (Goldney, Fisher & Wilson, 2001; Jorm et al., 1997; Jorm, Christensen & Griffiths, 2005). For instance, Jorm et al. (1997) revealed that only 39% of Australian respondents could accurately recognize symptoms of depression. The beliefs and attitudes of the general public has been shown to be frequently discordant with those held by mental health

46 professionals, with the public frequently viewing medication, hospitalisation, and psychiatric treatment
47 as harmful (Goldney et al., 2001; Jorm et al., 1997). Interestingly, according to Andrews (1999, p.
48 317), both mental health “patients and the media do not distinguish between the non-specific help from
49 counsellors and the specific treatment to be expected from mental health professionals”. This inability
50 to discriminate between the types of services offered lends further weight to the research suggesting
51 that the general public’s mental health literacy is still largely lacking (Goldney et al., 2001; Jorm et al.,
52 2005; Jorm & Kelly, 2007). In addition, various stereotypes regarding mentally ill individuals have
53 been shown to be held by the general public. Some common stereotypes include that mentally ill
54 persons are dangerous, dirty, unpredictable, and worthless (e.g., Angermeyer & Dietrich, 2006;
55 Corrigan, Kuwabara & O’Shaughnessy, 2009; Schnittker, 2008). An individual’s mental health
56 literacy, including his or her beliefs and attitudes towards mental illness, may influence or contribute to
57 the formulation of ‘lay appraisals’.

58 Evidence suggests that long before an individual sees a mental health professional, ‘lay
59 appraisals’ or ‘lay diagnoses’ are made by individuals, family members, friends, and co-workers
60 regarding the early signs of mental illness (Hollingshead, 2007). Lay appraisals are frequently
61 responsible for determining how and when an individual receives treatment for his or her mental illness
62 (Greenley & Mechanic, 1987; Pescosolido, Gardner & Lubell, 1998). As a result, a large portion of
63 people remain undiagnosed and untreated (Kessler et al., 1994; Shapiro, Skinner & Kessler, 1984). A
64 study by Link, Phelan, Bresnahan, Stueve and Pescosolido (1999) showed that many symptoms and
65 disorders are not accurately identified by the public as being a mental illness. However, in 2011,
66 Reavley and Jorm re-administered a national survey, originally distributed in 1995 and again in 2003-
67 2004, in order to identify changes in the mental health literacy of the Australian general public. The
68 results indicated that while there was an overall improvement in mental health literacy, with the public
69 more ably recognizing depression, more positively rating a range of interventions, and holding beliefs

70 and attitudes more consistent with those of mental health professionals, gains still need to be made with
71 respect to schizophrenia and anxiety disorders which are still under-recognised.

72 Some findings suggest that sex differences exist when it comes to public attitudes and beliefs
73 towards mental illness (e.g., Angermeyer, Matschinger & Holzinger, 1998; Cotton, Wright, Harris,
74 Jorm & McGorry, 2006; Holzinger, Floris, Schomerus, Carta & Angermeyer, 2012; Jorm et al., 1997);
75 females being seen at a greater risk of developing depression than males. Cotton et al. (2006)
76 investigated mental health literacy in young Australians between 12 and 25 years of age. They also
77 revealed that male youths exhibited significantly worse recognition of depressive symptoms than
78 female youths, with 61% of females able to correctly identify depression compared to 35% of males.
79 Furthermore, male youths were less likely than female youths to view seeing a psychologist or
80 counsellor as an appropriate treatment for psychosis.

81 These studies provide evidence that some sex differences in the mental health literacy of the
82 general public exists. However, it is unknown to what extent such differences currently exists in the
83 Australian general adult population. Expanding our knowledge of sex differences in public awareness
84 of mental illness could help to identify particular areas of mental health literacy in need of
85 improvement specific to each sex. High mental health literacy, including the ability to accurately
86 identify mental illness, may play a pivotal role in help-seeking behaviors and potentially decrease an
87 individual's vulnerability to suicide. Additionally, the identification of such sex disparities in mental
88 health literacy would help to facilitate and guide education programs about mental health, as well as
89 tailor specific individual psycho-education unique to each client.

90 One of the aims of this study was to build upon the current findings associated with mental health
91 literacy by investigating further the influence that sex has regarding the identification of, and attitudes
92 towards, various aspects of the three major types of mental illness in Australia (i.e., depression,
93 anxiety, and psychosis). As such, the hypotheses proposed to be explored by the present research are as

94 follows: (a) the general public's mental health literacy are likely to differ significantly for depression,
95 anxiety, and psychosis, (b) various aspects of the general public's mental health literacy toward
96 depression, anxiety, and psychosis are likely to differ significantly between males and females, and (c)
97 the sex of the individual expressing symptoms of depression, anxiety, and psychosis is likely to
98 influence various aspects of the general public's mental health literacy.

99 **Materials & Methods**

100 **Participants**

101 The participants consisted of 381 respondents of varying age, sex, and socio-demographic
102 backgrounds. Eight participants discontinued the questionnaire before completing all of the initial
103 socio-demographic background section and were excluded. The final sample of individuals who
104 participated in this study consisted of 373 participants between the ages of 18 and 84 ($M = 34.87$, $SD =$
105 12.46) with 28% ($n = 106$) of participants being male ($M = 35.95$, $SD = 12.72$), compared to 72% ($n =$
106 267) being female ($M = 34.44$, $SD = 12.36$).

107 Participants were recruited via invitation email through various mailing lists and via messages
108 posted on various social networking sites such as Facebook and Twitter, and by word of mouth. The
109 study was approved by the University of New England's Human Research Ethics Committee
110 (HE11/022).

111 **Materials and Procedures**

112 After reading the online information sheet and consenting to participate in the study, participants
113 completed demographic questions relating to their age, sex, schooling, locality (rural or urban),
114 income, and occupation. Following these, participants read a vignette (random allocation to one of
115 three vignettes) designed to emulate one of the three most common types of symptoms associated with
116 mental illness (i.e., depression, anxiety, and psychosis). Each vignette described an individual who was
117 experiencing symptoms of mental illness at a clinically significant level in which some form of

118 intervention would be recommended as per the criteria stipulated in the *Diagnostic and Statistical*
119 *Manual of Mental Disorders 5 (DSM-V; American Psychiatric Association [APA], 2013)*. The
120 depression and psychosis vignettes were adapted from the depression and schizophrenia vignettes used
121 by Jorm et al. (1997).

122 The names ‘John’ and ‘Jane’ were chosen for use in the vignettes due to the fact that they are
123 common Australian names with no cultural association to any minority groups. The age of the
124 protagonist was kept consistent at 30 years of age in order to avoid the potential confound of
125 developmental and psychosocial difficulties that often occur in childhood and adolescence as well as to
126 avoid age-specific neurological and physical conditions often present in older adults.

127 Participants were then asked a series of questions which were created to ascertain various aspects
128 of their mental health literacy regarding the mental illness depicted in the vignette (i.e., “In five words
129 or less, what would you say, if anything, is wrong with the individual in the vignette?”). Additional
130 questions were designed to ascertain the participants’ perceptions of the seriousness of the symptoms
131 described in the vignette (e.g., “To what extent would you rate the problems of the individual in the
132 story as being serious?”), and the perceived level of control that the participants believed the individual
133 in the vignette has over the symptoms described (i.e., “To what extent are the problems of the
134 individual in the story within his or her control?”).

135 The final questions related to participants’ sex perceptions regarding mental illness (e.g., “Which
136 group of people would you consider to be most likely to experience problems similar to those of the
137 individual in the story?”).

138 The following overall guidelines were established for the purposes of providing consistency and
139 accuracy in distinguishing between correct and incorrect responses: (a) the use of the general category
140 of mental illness (i.e., depression, anxiety, and psychosis), or a derivative of the word (e.g., depressive,
141 depressed, anxious, or psychotic) was regarded as a correct response; (b) the use of the exact *DSM-V*

142 diagnostic criteria, or subtype there of (e.g., major depression, dysthymia, generalised anxiety disorder,
143 or paranoid schizophrenia) was also regarded as a correct response; (c) references to symptoms of a
144 mental illness rather than the illness itself were not regarded as correct responses; (d) the term
145 “stressed” was not accepted as a correct identification of anxiety on the basis that it is frequently used
146 as a colloquial term that can encompass a broad range of symptoms, some of which are often not
147 associated with anxiety. Similarly, the terms “paranoid” and “delusional” were not accepted as correct
148 identification of psychosis as they may also be used in colloquial contexts, and refer to the symptoms
149 of schizophrenia rather than the illness itself; (e) misspelt words or phrases were accepted as correct
150 providing it was discernible as to what mental illness was intended; and (f) accurate responses were
151 maintained as correct regardless of additional information or diagnoses that were provided beyond that
152 of the correct diagnosis, as the participant demonstrated the ability to identify the mental illness in
153 question.

154 Results

155 Identification of Mental Illness

156 There was a strong association between correct identification and type of mental illness, $\chi^2(2, N =$
157 $373) = 52.11, p < .001, \phi = .37$, with 86% of participants correctly identifying depression, 57% of
158 participants correctly identifying anxiety, and 42% correctly identifying schizophrenia. There was also
159 a weak but statistically significant association between correct identification and sex, $\chi^2(1, N = 373) =$
160 $4.70, p = .03, \phi = -.11$, with 52% of male and 64% of female participants correctly identifying the
161 mental illness. There was only a weak association between correct identification and protagonist sex,
162 $\chi^2(1, N = 373) = 0.33, p = .056, \phi = .03$, with 62% of male and 59% of female protagonist mental
163 illness correctly identified.

164 Main Analyses

165 Four three-way between groups ANOVAs, type of illness by sex by protagonist sex, were
166 conducted for perceived seriousness, need for treatment, risk of self-harm, and personal control, see
167 Table 1. The means and standard deviations are reported in Table 2 along with any post hoc analysis of
168 main effects.

169 The interaction effect between *mental illness* and *participant sex* was significant for *need for*
170 *treatment*, indicating that the effect that participant sex has on the perceived need for treatment for
171 mental illness is dependent on the type of mental illness, see Figure 1. Analysis of simple effects was
172 conducted using separate one-way between groups ANOVAs to determine the independent effects of
173 participant sex and type of mental illness. For depression there was no significant difference between
174 participant sex, $F(1, 117) = 0.21, p = .65$, partial $\eta^2 < .01$. For anxiety there was a significant difference
175 between participant sex, $F(1, 122) = 11.80, p = .001$, partial $\eta^2 = .09$, with females ($M = 4.89, SD =$
176 1.17) perceiving a higher need for treatment than males ($M = 4.09, SD = 1.14$). For psychosis there was
177 a significant difference between participant sex, $F(1, 128) = 13.84, p < .001$, partial $\eta^2 = .10$, with
178 females ($M = 6.27, SD = 0.79$) perceiving a higher need for treatment than males ($M = 5.64, SD =$
179 1.02).

180 There was a significant interaction between participant and protagonist sex for *personal control*,
181 see Table 1, indicating that the effect that participant sex has on perceived level of control over mental
182 illness is dependent on the type of protagonist sex. Analysis of simple effects was conducted using
183 separate one-way between groups ANOVAs to determine the effects of participant and protagonist sex.
184 For males there was no significant difference between protagonist sex, $F(1, 104) = 3.05, p = .08$, partial
185 $\eta^2 = .03$. For females there was no significant difference between the protagonist sex, $F(1, 265) = 0.74,$
186 $p = .39$, partial $\eta^2 < .01$. For male protagonists there was no significant difference between participant
187 sex, $F(1, 180) = 0.23, p = .64$, partial $\eta^2 < .01$. For female protagonists there was a significant

188 difference between participant sex, $F(1, 189) = 10.77, p = .001$, partial $\eta^2 = .05$, with male participants
189 rating a higher level of perceived control than females, see Figure 2.

190 **Sex Susceptibility**

191 Three chi-square tests were performed to test if there was a relationship between perceived sex
192 susceptibility and the type of mental illness, participant sex, and protagonist sex. There was a
193 significant association between perceived sex susceptibility and type of mental illness, $\chi^2(4, N = 373) =$
194 $22.48, p < .001, \phi = .25$. From the participants who received the depression vignette, 13.8% indicated
195 that males are more susceptible, 15% indicated that females are more susceptible, and 72% indicated
196 that males and females are equally susceptible. From the participants who received the anxiety
197 vignette, 13% indicated that males are more susceptible, 23% indicated that females are more
198 susceptible, and 63% indicated that males and females are equally susceptible. From the participants
199 who received the psychosis vignette, 28% indicated that males are more susceptible, 6% indicated that
200 females are more susceptible, and 66% indicated that males and females are equally susceptible, see
201 Figure 3.

202 There was a significant association between perceived sex susceptibility and participant sex, $\chi^2(2,$
203 $N = 373) = 11.00, p = .004, \phi = .17$. From the male participants, 29% indicated that males are more
204 susceptible, 9% indicated that females are more susceptible, and 62% indicated that males and females
205 are equally susceptible. From the female participants, 15% indicated that males are more susceptible,
206 17% indicated that females are more susceptible, and 68% indicated that males and females are equally
207 susceptible, see Figure 4. There was a significant association between perceived sex susceptibility and
208 protagonist sex, $\chi^2(2, N = 373) = 35.70, p < .001, \phi = .31$. From the participants who received a male
209 protagonist vignette, 29% indicated that males are more susceptible, 6% indicated that females are
210 more susceptible, and 65% indicated that males and females are equally susceptible. From the
211 participants who received a female protagonist vignette, 9% indicated that males are more susceptible,

212 22% indicated that females are more susceptible, and 69% indicated that males and females are equally
213 susceptible, see Figure 5.

214 **Discussion**

215 This study explored whether the mental health literacy of members of the general public was
216 influenced by (a) the type of mental illness, (b) the sex of the individual experiencing the symptoms of
217 mental illness, and (c) the sex of the individual identifying and appraising the mental illness.

218 Participants read a vignette describing either a male or female experiencing clinically significant
219 symptoms of depression, anxiety, or psychosis. Participants were then asked a number of questions in
220 order to assess various aspects of their mental health literacy. The results were consistent with the
221 hypothesis that some aspects of mental health literacy are influenced by the type of mental illness, sex
222 of the participant, and sex of the protagonist.

223 As hypothesized, the type of mental illness directly influenced participants' abilities to accurately
224 identify the presenting symptoms, with depression resulting as the most readily identifiable mental
225 illness (85.7%), followed by anxiety (56.5%), and then psychosis (41.5%). These findings suggest that
226 the general public is relatively good at identifying symptoms of depression, but find it significantly
227 more difficult to identify anxiety and psychosis. This is consistent with previous research that has
228 shown depression to be more readily identifiable by the general public than psychosis (e.g., Jorm et al.,
229 1997). A number of factors may contribute to the increased recognition of depression over anxiety and
230 psychosis. First, a greater prevalence of depression and anxiety in Australia compared to psychosis
231 may result in members of the general public having greater exposure and experience with such mental
232 illnesses. Second, the term *depression* is more readily used in the Australian vernacular and is
233 associated with fewer and milder social stigmas. Finally, compared to depression and anxiety, which
234 refer to broad categories of psychological symptoms, psychosis refers to a more specific set of

235 psychological symptoms outlined in the *DSM-V*, subsequently making it more difficult to accurately
236 identify (APA, 2013; ABS, 2009).

237 Across the measures of level of seriousness, participants showed the greatest level of concern
238 towards individuals with psychosis, followed by depression, and anxiety. This is in line with evidence
239 that has shown that psychosis and depression are associated with increased levels of morbidity and
240 mortality compared to the general population, in particular, relating to serious cardiovascular events
241 (Casey et al., 2004; Musselman, Evans & Nemeroff, 1998; Wulsin, Vaillant & Wells, 1999). Similarly,
242 psychosis and depression are associated with increased levels of suicide attempts compared to the
243 general population. In fact, suicide is the leading cause of premature death among individuals with
244 schizophrenia (Fenton, 2010). These findings suggest that the general public have accurate perceptions
245 of the seriousness of mental illnesses and support the finding by Jorm et al. (2006) which identified a
246 growing trend of improved mental health literacy of the general public over the past decade. The
247 current study appears to support this contention of increased improvement.

248 As hypothesized, a significant difference existed between each participant sex and their
249 respective ability to accurately identify the presenting symptoms, with 64% of females able to correctly
250 identify the mental illness provided compared to 52% of males. Across the measures of level of
251 seriousness, females displayed an overall tendency to perceive the symptoms of mental illness as more
252 serious compared to males.

253 These findings are congruent with previous studies suggesting that when compared with females,
254 males display a poorer ability to correctly identify mental illness as well as more restrictive attitudes
255 towards the various aspects of mental illness (Cotton et al., 2006; Kaneko & Motohashi, 2007). One
256 possible explanation for these findings is that females may be inherently more psychologically minded,
257 introspective, and emotionally aware, thus increasing the likelihood that they would (a) engage in
258 conversations relating to emotional and psychological difficulties, (b) have contact or interactions with

259 individuals who have a mental illness, and/or (c) participate in studies relating to mental health literacy
260 (Petrides, Furnham & Martin, 2004).

261 Finally, as hypothesized, the sex of the protagonist presented in the vignette provided had an
262 influence on a number of aspects of mental health literacy including the perceived level of seriousness,
263 degree of personal control, and sex susceptibility. Individuals who received a male protagonist vignette
264 displayed a tendency to report marginally higher levels of perceived seriousness compared to
265 individuals who read about a female protagonist. Furthermore, of the individuals provided with a male
266 protagonist vignette, 29% indicated that males were more likely to be susceptible to mental illness
267 compared to 6% of individuals who indicated that females were more likely. Conversely, when
268 presented with a female protagonist vignette the opposite trend was observed, with 22% indicating that
269 females were more likely to be susceptible to mental illness compared to 9% of individuals who
270 indicate that males were more likely.

271 Further findings indicated that when provided with a female protagonist vignette, males
272 displayed a tendency to perceive a higher level of personal control over mental illness than females.
273 However, when provided with a male protagonist vignette no sex differences were observed. These
274 results are consistent with, and build upon, preliminary evidence obtained by Jorm et al. (1997) by
275 suggesting that protagonist sex may influence mental health literacy not only through self-reported
276 beliefs, but also as a result of innate perceptions regarding mental illness.

277 **Limitations**

278 Similar to other research conducted regarding mental health literacy, this research adopted the
279 use of a brief written vignette. The use of such a vignette presents two distinct complications. First, it is
280 uncertain whether a written description of symptoms of mental illness elicits the same attitudes and
281 perceptions as obtaining the same information from face-to-face observations and verbal
282 communication. It is likely that overt body language and non-verbal communication (i.e., facial

283 expressions, eye contact, tone of voice) would provide additional information from which to identify
284 and evaluate an individual's symptoms of mental illness.

285 Second, it is unknown whether the level of concern expressed towards a vignette of mental
286 illness is comparable or equivalent to that expressed towards a real person and whether there are any
287 differences in the subsequent therapeutic actions taken from such concern (i.e., help seeking behavior).
288 Some research has shown that a discrepancy exists between what behaviors, interventions, and
289 professionals an individual believes are helpful and what therapeutic actions he or she actually employs
290 (Jorm et al., 2000). Similarly, differences are also demonstrated between what an individual believes
291 will help another person and what actions they would take for themselves (Raviv, Sills, Raviv &
292 Wilansky, 2000).

293 About 72% of the participants in the present study were females. This is consistent with other
294 research on mental health literacy that has shown males are less likely than females to participate in
295 studies relating to mental health literacy (e.g., Burns & Rapee, 2006; Jorm et al, 1997; Link et al.,
296 1999). Such a discrepancy may have potentially created an overrepresentation of female beliefs and
297 attitudes when performing comparisons based on the entire sample. However, there were no
298 statistically significant sex related interactions except for need for treatment.

299 The vignettes employed in this study depicted three different mental illnesses clearly
300 distinguishable from each other through the absence of overlapping symptoms or comorbid diagnoses
301 involving substance abuse, medical conditions, trauma, personality disorders, or intellectual
302 difficulties. Comorbidity among mental illness is extremely high and would inevitably have a large
303 impact on an individual's ability to accurately identify and evaluate mental illness. As such, the
304 findings from this study may not be extrapolated to apply to common situations whereby comorbidity
305 is present (Kessler et al., 2005). Similarly, the vignettes utilized in this study described the protagonists
306 as being 30 years of age in order to maintain consistency. Unique age-related difficulties in younger

307 (e.g., puberty) and older populations (e.g., cognitive decline) may potentially complicate the
308 identification of mental illness (Bartels, 2004; Pottick, Hansell, Gutterman & Raskin-White, 1995).

309 Future research on mental health literacy may consider several issues: (a) considering whether
310 the trends displayed using vignettes are comparable to ‘real life’ symptoms (b) the extent to which
311 expressed concerns towards mental illness equate to therapeutic action (c) the influence of comorbidity
312 towards mental health literacy (d) the influence of the age of the protagonist, (e) the effect of utilizing a
313 vignette describing sub-clinical everyday problems as a comparison, (f) exploration of the possible
314 reasons behind participants’ mental health literacy, and (g) examining comparisons between the mental
315 health literacy of youths, adolescents, and adults.

316 **Conclusions**

317 The findings from this study suggest that the Australian general public is relatively proficient at
318 correctly identifying mental illness, in particular symptoms of depression. The general public also
319 displayed relatively accurate perceptions of the severity and seriousness of symptoms of depression,
320 anxiety, and psychosis. Males exhibited poorer mental health literacy skills than females, with males
321 being less likely to correctly identify the type of mental illness, displaying a tendency to rate symptoms
322 as being less serious, and perceiving greater personal control over mental illness. These findings help
323 to identify numerous areas of public mental health literacy that may be improved in the Australian
324 general public, namely education programs targeted towards increasing awareness of mental illness in
325 the male population.

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References

- American Psychiatric Association 2013. *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: Author.
- Andrews, G. 1999. Efficacy, effectiveness, and efficiency in mental health service delivery. *Australian and New Zealand Journal of Psychiatry*, 33:316-322 doi: 10.1046/j.1440-1614.1999.00581.x.
- Angermeyer, MC, Dietrich, S. 2006. Public beliefs about and attitudes towards people with mental illness: A review of population studies. *Acta Psychiatrica Scandinavica*, 113:63-179 doi: 10.1111/j.1600-0447.2005.00699.x.
- Angermeyer, MC, Matschinger, H, Holzinger, A. 1998. Gender and attitudes towards people with schizophrenia. Results of a representative survey in the Federal Republic of Germany. *International Journal of Social Psychiatry*, 44:107-116.
- Australian Bureau of Statistics 2009. *Australian social trends in mental health: Summary of findings* (Cat No. 4102.0). Available at <http://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/4102.0Main+Features30March%202009>
- Bartels, SJ. 2004. Caring for the whole person: Integrated health care for older adults with severe mental illness and medical comorbidity. *Journal of the Geriatrics Society*, 52:249-257 doi: 10.1111/j.1532-5415.2004.52601.x.
- Burns, JR, Rapee, RM. 2006. Adolescent mental health literacy: Young people's knowledge of depression and help seeking. *Journal of Adolescence*, 29:225-239 doi:10.1016/j.adolescence.2005.05.004.
- Casey, DE, Haupt, DW, Newcomer, JW, Henderson, DC, Sernyak, MJ, Davidson, M, ... Hennekens, CH. 2004. Antipsychotic-induced weight gain and metabolic abnormalities: Implications for increased mortality in patients with schizophrenia. *Journal of Clinical Psychiatry*, 65:4-18.

- 351 Corrigan, PW, Kuwabara, SA, O'Shaughnessy, J. 2009. The public stigma of mental illness and drug
352 addiction. *Journal of Social Work*, 9:139-147 doi: 10.1177/1468017308101818.
- 353 Cotton, SM, Wright, A, Harris, MG, Jorm, AF, McGorry, PD. 2006. Influence of mental health literacy
354 in young Australians. *Australian and New Zealand Journal of Psychiatry*, 40:790-796
355 doi: 10.1111/j.1440-1614.2006.01885.x.
- 356 Dahlberg, KM, Waern, M, Runeson, B. 2008. Mental health literacy and attitudes in a Swedish
357 community sample: Investigating the role of personal experience of mental health care. *BMC*
358 *Public Health*, 8:8-18 doi: 10.1186/1471-2458-8-8.
- 359 Farrer, L, Leach, L, Griffiths, KM, Christensen, H, Jorm, AF. 2008. Age differences in mental health
360 literacy. *BMC Public Health*, 8:125-133 doi: 10.1186/1471-2458-8-125.
- 361 Fenton, WS. 2010. Depression, suicide, and suicide prevention in schizophrenia. *Suicide and Life-*
362 *Threatening Behavior*, 30:34-49 doi: 10.1111/j.1943-278X.2000.tb01063.x.
- 363 Goldney, RD, Fisher, LJ, Wilson, DH. 2001. Mental health literacy: An impediment to the optimum
364 treatment of major depression in the community. *Journal of Affective Disorders*, 64:277-284 doi:
365 10.1016/S0165-0327(00)00227-5.
- 366 Greenley, JR, Mechanic, D. 1976. Social selection in seeking help for psychological problems. *Journal*
367 *of Health & Social Behavior*, 17:249-262 doi: 10.2307/2136546.
- 368 Griffiths, KM, Christensen, H, Jorm, AF. 2009. Mental health literacy as a function of remoteness of
369 residence: An Australian national study. *BMC Public Health*, 9:92-112 doi:10.1186/1471-2458-
370 9-92.
- 371 Hollingshead, AB. 2007. Social class and mental illness: A community study. *American Journal of*
372 *Public Health*, 97:1756-1757 doi: 10.2105/AJPH.97.10.1756.
- 373 Holzinger, A, Floris, F, Schomerus, G, Carta, MG, Angermeyer, MC. 2012. Gender differences in
374 public beliefs and attitudes about mental disorder in western countries: A systematic review of

375 population studies. *Epidemiology and Psychiatric Sciences*, 21:73-85 doi:
376 :10.1017/S2045796011000552.

377 Jorm, AF, Barney, LJ, Christensen, H, Highet, NJ, Kelly, CM, Kitchener, BA. 2006. Research on
378 mental health literacy: What we know and what we still need to know. *Australian and New*
379 *Zealand Journal of Psychiatry*, 40:3-5 doi: 10.1111/j.1440-1614.2006.01734.x.

380 Jorm, AF, Christensen, H, Griffiths, KM. 2005. Belief in the harmfulness of antidepressants: Results
381 from a national survey of the Australian public. *Journal of Affective Disorders*, 88:47-53 doi:
382 10.1016/j.jad.2005.06.002.

383 Jorm, AF, Christensen, H, Griffiths, KM. 2006. The public's ability to recognize mental disorders and
384 their beliefs about treatment: Changes in Australia over 8 years. *Australian & New Zealand*
385 *Journal of Psychiatry*, 40:36-41 doi: 10.1111/j.1440-1614.2006.01738.x.

386 Jorm, AF, Christensen, H, Medway, J, Korten, AE, Jacomb, PA, Rodgers, B. 2000. Public beliefs about
387 the helpfulness of interventions for depression: Effects on actions taken when experiencing
388 anxiety and depression symptoms. *Australian and New Zealand Journal of Psychiatry*, 34:619-
389 626 doi: 10.1046/j.1440-1614.2000.00761.x.

390 Jorm, AF, Kelly, CM. 2007. Improving the public's understanding and response to mental disorders.
391 *Australian Psychologist*, 42:81-89 doi: 10.1080/00050060701280565.

392 Jorm, AF, Korten, AE, Jacomb, PA, Christensen, H, Rogers, B, Pollitt, P. 1997. Public beliefs about
393 causes and risk factors for depression and schizophrenia. *Social Psychiatry and Psychiatric*
394 *Epidemiology*, 32:143-148 doi: 10.1007/bf00794613.

395 Kaneko, Y, Motohashi, Y. 2007. Male gender and low education with poor mental health literacy: A
396 population-based study. *Journal of Epidemiology*, 17:114-119 doi.org/10.2188/jea.17.114.

- 397 Kessler, RC, Berglund, P, Zhao, S, Demler, O, Jin, R, Merikangas, KR, Walters, EE. 2005. Lifetime
398 prevalence and age-of-onset distributions of *DSM-IV* disorders in the national comorbidity
399 survey replication. *Archives of General Psychiatry*, 62:593-602 doi:10.1001/archpsyc.62.6.593.
- 400 Kessler, RC, McGonagle, KA, Zhao, S, Nelson, CB, Hughes, M, Eshleman, S, Wittchen, H-U,
401 Kendler, KS. 1994. Lifetime and 12-month prevalence of *DSM-III-R* psychiatric disorders in
402 the United States: Results from the national comorbidity survey. *Archives of General*
403 *Psychiatry*, 51:8-19 doi:10.1001/archpsyc.1994.03950010008002.
- 404 Kuyken, W, Brewin, CR, Power, MJ, Furnham, A. 1992. Causal beliefs about depression in depressed
405 patients, clinical psychologists and lay persons. *British Journal of Medical Psychology*, 65:257-
406 268 doi: 10.1111/j.2044-8341.1992.tb01706.x.
- 407 Link, BG, Phelan, JC, Bresnahan, M, Stueve, A, Pescosolido, BA. 1999. Public conceptions of mental
408 illness: Labels, causes, dangerousness, and social distance. *American Journal of Public Health*,
409 89:1328-1333 doi: 10.2105/AJPH.89.9.1328.
- 410 Musselman, DL, Evans, DL, Nemeroff, CB. 1998. The relationship of depression to cardiovascular
411 disease: Epidemiology, biology, and treatment. *Archives of General Psychiatry*, 55:580-592
412 doi:10.1001/archpsyc.55.7.580.
- 413 Pescosolido, BA, Gardner, CB, Lubell, KM. 1998. How people get into mental health services: Stories
414 of choice, coercion and 'muddling through' from 'first-timers'. *Social Science &*
415 *Medicine*, 46:275-286 doi: 10.1016/S0277-9536(97)00160-3.
- 416 Petrides, KV, Furnham, A, Martin, GN. 2004. Estimates of emotional and psychometric intelligence:
417 Evidence for gender-based stereotypes. *Journal of Social Psychology*, 144:149-162 doi:
418 10.3200/SOCP.144.2.149-162.
- 419 Pottick, K, Hansell, S, Gutterman, E, Raskin-White, HR. 1995. Factors associated with inpatient and
420 outpatient treatment for children and adolescents with serious mental illness. *Journal of the*

421 *American Academy of Child and Adolescent Psychiatry*, 34:425-433 doi: 10.1097/00004583-
422 199504000-00009.

423 Raviv, A, Sills, R, Raviv, A, Wilansky, P. 2000. Adolescents' help-seeking behaviour: The difference
424 between self and other-referral. *Journal of Adolescence*, 23:721-740 doi:
425 10.1006/jado.2000.0355.

426 Reavley, NJ, Jorm, AF. 2011. Recognition of mental disorders and beliefs about treatment and
427 outcome: Findings from an Australian national survey of mental health literacy and stigma.
428 *Australian and New Zealand Journal of Psychiatry*, 45:947-956 doi:
429 10.3109/00048674.2011.621060.

430 Shapiro, S, Skinner, EA, Kessler, LG. 1984. Utilization of health and mental health services: Three
431 epidemiologic catchment area sites. *Archives of General Psychiatry*, 41:971-978
432 doi:10.1001/archpsyc.1984.01790210053007.

433 Schnittker, J. 2008. An uncertain revolution: Why the rise of a genetic model of mental illness has not
434 increased tolerance. *Social Science and Medicine*, 67:1370-1381 doi:
435 10.1016/j.socscimed.2008.07.007.

436 Wulsin, LR, Vaillant, GE, Wells, VE. 1999. A systematic review of the mortality of depression.
437 *Psychosomatic Medicine*, 61:6-17.

Table 1 (on next page)

Between Groups ANOVAs for the Effects of Illness, Gender, and Protagonist Gender on Perceived Seriousness, Need for Treatment, Risk of Self-harm, and Personal Control

2 Table 1

3 *Between Groups ANOVAs for the Effects of Illness, Sex, and Protagonist Sex on Perceived Seriousness,*

4 *Need for Treatment, Risk of Self-harm, and Personal Control*

Measures	Perceived Seriousness		Need for Treatment		Risk of Self-harm		Personal Control	
	<i>F</i>	Partial η^2	<i>F</i>	Partial η^2	<i>F</i>	Partial η^2	<i>F</i>	Partial η^2
Illness type (I)	69.74***	.28	49.81***	.22	41.18***	.19	20.50***	.10
Sex (S)	6.19*	.02	18.29***	.05	3.12	.01	7.01**	.02
Protagonist sex (PS)	4.73*	.01	1.04	<.01	1.95	.01	0.79	<.01
I × S	2.01	.01	3.11*	.02	0.98	.01	0.36	<.01
I × PS	0.02	<.01	0.16	<.01	1.33	.01	0.30	<.01
S × PS	2.22	.01	0.006	<.01	1.78	.01	4.70*	.01
I × S × PS	0.76	<.01	0.44	<.01	1.76	.01	1.42	.01

5 Note. * $p < .05$, ** $p < .01$, *** $p < .001$

6

Table 2 (on next page)

Means and Standard Deviations for Condition, Gender of participants and protagonist by the Perceived Seriousness, Need for Treatment, Risk of Self-Harm, and Personal Control

2 Table 2

3 *Means and Standard Deviations for Condition, Sex of Participants and Protagonist by Perceived*

4 *Seriousness, Need for Treatment, Risk of Self-harm, and Personal Control*

Measure	Perceived Seriousness	Need for Treatment	Risk of Self- harm	Personal Control
Illness				
Depression	5.57 (1.04) _a	5.13 (1.10) _a	4.53 (1.42) _a	3.81 (1.37) _a
Anxiety	4.87 (1.18) _b	4.67 (1.21) _b	3.82 (1.42) _b	4.04 (1.48) _a
Psychosis	6.46 (0.75) _c	6.09 (0.90) _c	5.58 (1.21) _c	2.86 (1.56) _b
Participant				
Male	5.46 (1.30) _a	4.94 (1.26) _a	4.47 (1.53) _a	3.87 (1.49) _a
Female	5.72 (1.14) _b	5.46 (1.19) _b	4.73 (1.53) _a	3.43 (1.57) _b
Protagonist				
Male	5.74 (1.20) _a	5.36 (1.21) _a	4.73 (1.53) _a	3.56 (1.64) _a
Female	5.57 (1.19) _b	5.26 (1.25) _a	4.60 (1.54) _a	3.55 (1.48) _a

5 *Note.* Values within variables in columns that share a subscript are not different by alpha criterion of .05 (Sidak adjusted).

Figure 1(on next page)

Image of need for treatment expressed by male and female participants towards the three types of mental illness.

Need for treatment expressed by male and female participants towards the three types of mental illness.

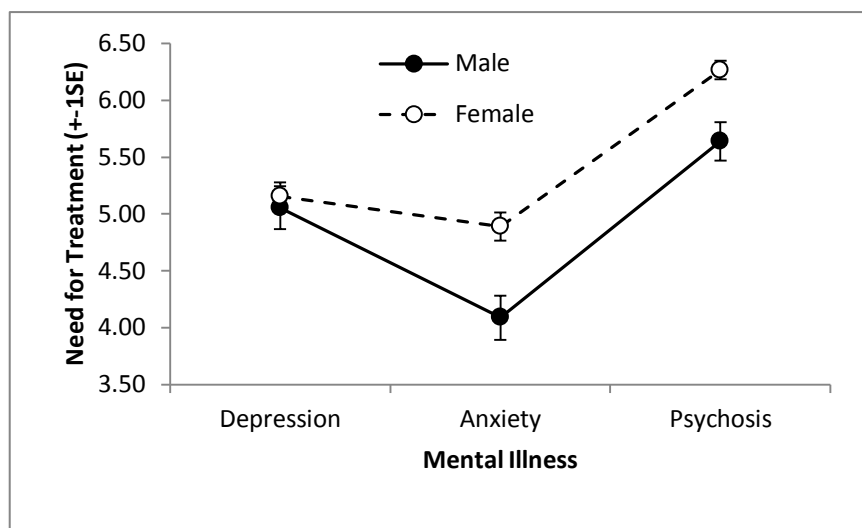


Figure 1. Need for treatment expressed by male and female participants towards the three types of mental illness.

Figure 2(on next page)

Image of perceived level of personal control over mental illness for each protagonist gender as rated by each participant gender.

Perceived level of personal control over mental illness for each protagonist gender as rated by each participant gender.

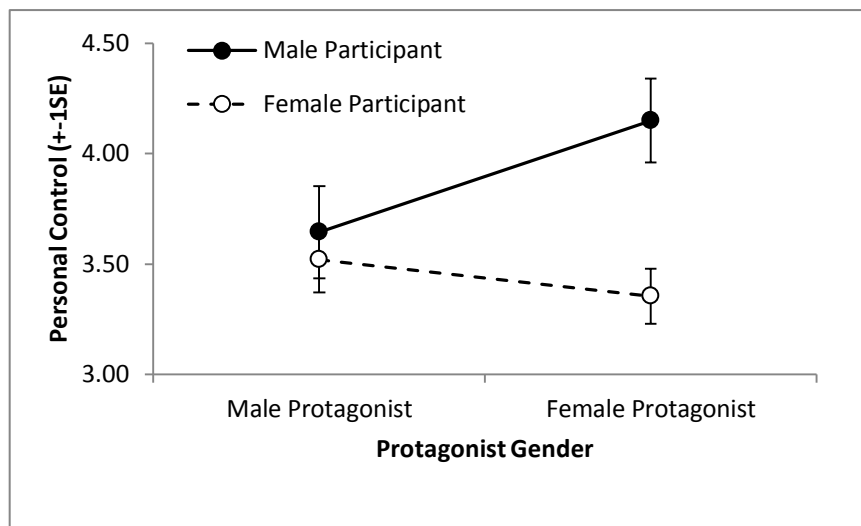


Figure 2. Perceived level of personal control over mental illness for each protagonist gender as rated by each participant gender.

Figure 3(on next page)

Image of number of participants who indicated each gender as being more susceptible to depression, anxiety, and psychosis.

Number of participants who indicated each gender as being more susceptible to depression, anxiety, and psychosis.

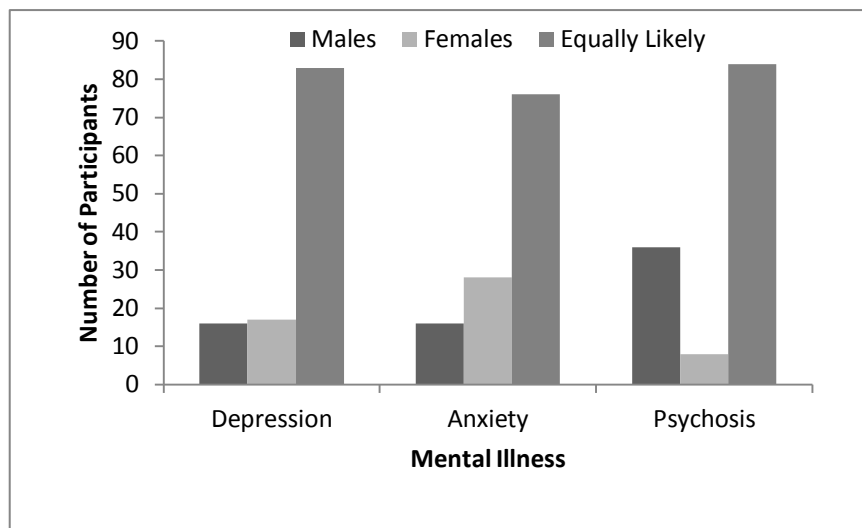


Figure 3. Number of participants who indicated each gender as being more susceptible to depression, anxiety, and psychosis.

Figure 4(on next page)

Image of number of male and female participants who indicated each gender as being more susceptible to mental illness.

Number of male and female participants who indicated each gender as being more susceptible to mental illness.

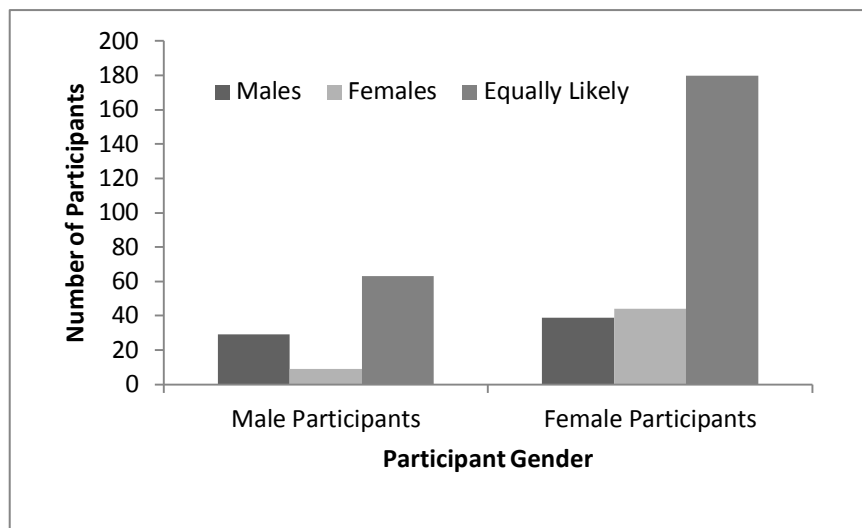


Figure 4. Number of male and female participants who indicated each gender as being more susceptible to mental illness.

Figure 5(on next page)

Image of number of participants for each protagonist gender who indicated each gender as being more susceptible to mental illness.

Number of participants for each protagonist gender who indicated each gender as being more susceptible to mental illness.

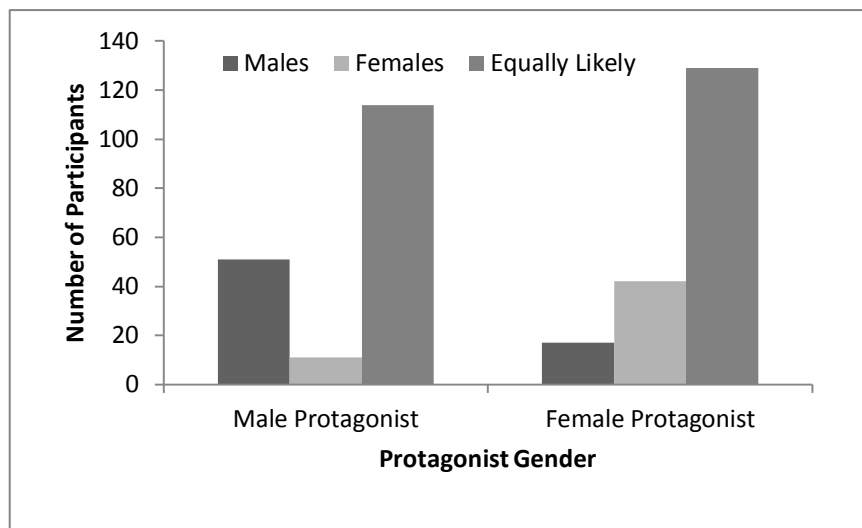


Figure 5. Number of participants for each protagonist gender who indicated each gender as being more susceptible to mental illness.