

Changes in stigma and help-seeking in relation to postpartum depression: Non-clinical parenting intervention sample

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Postpartum depression (PPD) is a prevalent mental illness affecting women, and less commonly, men in the weeks and months after giving birth. Despite the high incidence of PPD in Australia, rates for help-seeking remain low, with stigma and discrimination frequently cited as the most common deterrents to seeking help from a professional source. The present study sought to investigate PPD stigma in a sample of parents and to examine the effects of an intervention stigma and help-seeking behaviour. A total of 212 parents aged 18 to 71 years ($M=36.88$, 194 females) completed measures of personal and perceived PPD stigma and attitudes towards seeking mental health services and were randomly assigned to an intervention or control group. Results showed that there were no effects for type of intervention on either personal or perceived PPD stigma scores. No effect was found for help-seeking propensity. Males had higher personal PPD stigma than females and older age was associated with lower personal PPD stigma. Familiarity with PPD was associated with perceived PPD stigma in others but not personal PPD stigma. More work needs to be conducted to develop interventions to reduce PPD stigma in the community.

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Changes in Stigma and Help-Seeking in Relation to Postpartum Depression: Non-Clinical
Parenting Intervention Sample

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28 Abstract

29 Postpartum depression (PPD) is a prevalent mental illness affecting women, and less commonly,
30 men in the weeks and months after giving birth. Despite the high incidence of PPD in Australia,
31 rates for help-seeking remain low, with stigma and discrimination frequently cited as the most
32 common deterrents to seeking help from a professional source. The present study sought to
33 investigate PPD stigma in a sample of parents and to examine the effects of an intervention
34 stigma and help-seeking behaviour. A total of 212 parents aged 18 to 71 years ($M=36.88$, 194
35 females) completed measures of personal and perceived PPD stigma and attitudes towards
36 seeking mental health services and were randomly assigned to an intervention or control group.
37 Results showed that there were no effects for type of intervention on either personal or perceived
38 PPD stigma scores. No effect was found for help-seeking propensity. Males had higher personal
39 PPD stigma than females and older age was associated with lower personal PPD stigma.
40 Familiarity with PPD was associated with perceived PPD stigma in others but not personal PPD
41 stigma. More work needs to be conducted to develop interventions to reduce PPD stigma in the
42 community.

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45 Keywords: Postpartum depression, intervention, stigma, help-seeking

46

47 Changes in Postpartum Depression in Relation to an Intervention: Non-Clinical Parenting
48 Sample

49 Mental illness has been identified as making a substantial contribution to the global
50 burden of disease (Prince et al., 2007; Vigo, Thornicroft, & Atun, 2016). According to the
51 (World Health Organization, 2017), depression is the leading cause of disability worldwide.
52 Accordingly, depression and anxiety are the most prevalent mental disorders experienced by
53 Australians (Australian Bureau of Statistics, 2008 [ABS]). The present study focuses specifically
54 on postpartum depression (PPD) which affects up to one in seven women or 16% of those giving
55 birth (beyondblue, 2016) and one in ten men in Australia (Post and Antenatal Depression
56 Association, 2017 [PANDA]).

57 Individuals with a depressive illness have to not only manage their symptoms but also
58 cope with the stigma and discrimination these conditions receive. Stigma has a large impact on
59 help-seeking behaviours with research indicating that many sufferers choose not to pursue
60 treatment so as to avoid the label of ‘mental illness’ and the discrimination associated with such
61 a label (Barney, Griffiths, Jorm, & Christensen, 2006; Byrne, 2000; Corrigan, 2004).

62 **Postpartum Depression**

63 The *Diagnostic and Statistical Manual of Mental Disorders – 5 (DSM-5;* (American
64 Psychiatric Association, 2013) lists peripartum onset as a specifier for a major depressive
65 episode. PPD is based on the same diagnostic criteria as a major depressive episode, but with the
66 onset of symptoms (e.g., negative mood, sleep disturbance, significant changes in appetite, poor
67 concentration, and loss of interest or pleasure) occurring during the last month of gestation or the
68 first several months after delivery. The likelihood of suffering PPD is high (44% with likely or
69 possible PPD; Jackman, Thorsteinsson, & McNeil, 2017) and PPD can range in severity from

70 mild to severe and symptoms can begin suddenly after the birth of a child or appear gradually in
71 the weeks or months during the first year after birth (Gidget Foundation, 2014; Post and
72 Antenatal Depression Association, 2017). Maternal or paternal PPD can have devastating effects
73 on children and can lead to disturbances in children's social, behavioural, cognitive, and physical
74 development (Ramchandani, Stein, Evans, & O'Connor, 2005; Ramchandani et al., 2008).

75 **Stigma**

76 According to (Goffman, 1963 p. 3), stigma refers to “an attribute that is deeply
77 discrediting” and is generally “linked with illnesses or conditions that are believed to be under
78 the individual’s control or manifested as a consequence of unacceptable social behavior” (Pinto-
79 Foltz & Logsdon, 2008), pp. 21–22). When stigma occurs, a person is labelled by their illness
80 and viewed as part of a stereotyped group (Corrigan, 2004). Stigmas are defined as having three
81 elements – problems of knowledge (ignorance or misinformation, e.g., a belief that someone is
82 dangerous); problems of attitudes (prejudice that may lead to emotional reactions, e.g., fearing
83 someone because of the belief that someone is dangerous); and problems of behaviour
84 (discrimination, e.g., avoiding someone with depression; beyondblue, 2015). There are also
85 different types of stigma including personal (i.e., own beliefs about other people); perceived (i.e.,
86 expectations of others’ beliefs); self (i.e., stigmatising views held about the self), and structural
87 (i.e., policies that restrict the opportunities, resources, and wellbeing of people with depression;
88 beyondblue, 2015). Notably, personal and perceived stigma are thought to strongly influence an
89 individual’s help-seeking behaviour (Barney et al., 2006; Corrigan, Markowitz, Watson, Rowan,
90 & Kubiak, 2003) and are the focus of the present study.

91 **Familiarity**

92 Familiarity with mental illness is highly correlated with stigma. Familiarity is described
93 as the knowledge of and experience with mental illness (Corrigan et al., 2003). Familiarity can
94 be viewed on a continuum of intensity from viewing portrayals of mental illness on television, to
95 having a friend with a mental illness, to having a mental illness oneself. Research shows that
96 higher familiarity reduces stigma and stereotyping towards persons with a mental illness (Calear,
97 Griffiths, & Christensen, 2011; Corrigan, 2004). Recognition of PPD has been reported as higher
98 than 70% (Thorsteinsson, Loi, & Moulynox, 2014).

99 **Stereotypes**

100 Stigmas are also closely linked with stereotypes. Stereotypes are described as knowledge
101 structures that the public collectively holds about a specific social group (Corrigan, 2004).
102 Common stereotypes regarding people with a mental illness tend to be negative and include
103 violence (e.g., “people with a mental illness are dangerous”), incompetence (e.g., “people with a
104 mental illness are unable to look after themselves”), and blame (e.g., “people with a mental
105 illness are weak and are responsible for their disorder”; (Barney et al., 2006; Cornally &
106 McCarthy, 2011). Stereotyping leads to prejudice which in turn leads to discrimination towards
107 individuals with a mental illness (Corrigan, 2004; Reavley & Jorm, 2011).

108 **Predictors of depression stigma.** Several studies have explored common attributes of
109 individuals who hold high levels of stigma. (Griffiths, Christensen, & Jorm, 2008) found that
110 personal stigma was higher among males and the elderly. Similarly, (Calear et al., 2011) found
111 that personal depression stigma was predicted by being male and having no personal or parental
112 history (i.e., familiarity) of depression.

113 **Help-Seeking Behaviours**

114 From a mental health perspective, help-seeking is defined as a flexible coping process
115 that involves obtaining external assistance to treat a mental health concern (Rickwood, Thomas,
116 & Bradford, 2013). Despite the high incidence of mental illness in Australia, the majority of
117 sufferers do not access professional help services. Studies show that among individuals suffering
118 from a mental illness, up to 65% do not consult mental health professionals, resulting in a
119 distinct variance between the incidence of illness and the extent of professional help-seeking
120 (Australian Bureau of Statistics, 2008; Rickwood et al., 2013).

121 Research shows that help-seeking behaviour may be inhibited if other members of the
122 community are perceived as holding negative stigmas (Corrigan & Watson, 2002; Dew, Dunn,
123 Bromet, & Schulberg, 1988; Vogel, Wade, Wester, Larson, & Hackler, 2007). Recently, the
124 topic of help-seeking behaviours has gained popularity as researchers attempt to explore and
125 understand individuals' delayed responsive actions to symptoms of illness across a variety of
126 health conditions.

127 **Challenging Stigma and Improving Help-Seeking Behaviour**

128 PPD is often left untreated as women frequently report feeling ashamed about seeking
129 help, and hold concerns about being branded a 'bad mother' if they acknowledge that they are
130 battling depression (Saporito, Ryan, & Teachman, 2011). Effective anti-stigma strategies include
131 education (e.g., challenging the myths of mental illness with factual information); protest (e.g.,
132 making moral appeals to stop stigmatisation); and contact (e.g., creating equal interactions
133 between the public and individuals with a mental illness; (Corrigan et al., 2003; Griffiths,
134 Carron-Arthur, Parsons, & Reid, 2014). (Griffiths, Christensen, Jorm, Evans, & Groves, 2004)
135 found that brief targeted education programs involving web-based literacy (i.e., BluePages; The

136 Australian National University, 2018) and cognitive-behavioural interventions (i.e., moodgym;
137 ehubHealth, 2018) were effective in reducing levels of depression stigma.

138 To date there has been some research interest in depression-related stigma (e.g., Barney
139 et al., 2006; Byrne, 2000; Griffiths et al., 2014). However, few studies have addressed PPD
140 stigma. Research has found that knowing someone with depression is associated with less
141 stigmatising attitudes (Corrigan & Watson, 2007; Griffiths et al., 2008). Targeted education
142 programs that teach individuals that mental disorders are an illness like any other have been
143 shown to be effective (Corrigan & Watson, 2007).

144 **The Present Study**

145 Given the lack of research on depression stigma, the aim of the current study was to
146 examine existing levels of personal and perceived depression stigma among a sample of parents
147 to determine if targeted intervention materials (i.e., factsheet and documentary) can reduce levels
148 of depression stigma. Based on the literature discussed, it was hypothesised that (1) an education
149 intervention would influence depression stigma and help-seeking behaviour scores. Specifically,
150 the participants in the PPD factsheet or video documentary groups would have lower depression
151 stigma and higher help-seeking behaviour scores (pre-test versus post-test measures) compared
152 to the control groups (i.e., family documentary or raising children factsheet); (2) levels of
153 familiarity with PPD would be inversely correlated with levels of both personal and perceived
154 stigma; and (3) males and older persons would have higher levels of personal PPD stigma than
155 females and younger persons, respectively.

156

Method**157 Participants**

158 The study was accessed by 594 participants. However, due to an incompatibility between
159 the software platform and video usage on smartphones, tablets, and some web browsers, a
160 majority of the participants ($n=373$; 62.8%) were unable to complete the survey. A further nine
161 participants were eliminated from the study due to incomplete questionnaires. Therefore, useable
162 data (The Authors, 2018) was obtained from 212 participants (35.7% retention rate) aged
163 between 18 and 71 years ($M=36.88$, $SD=8.71$). An a priori power analysis showed that 192
164 participants would be needed to achieve power = .80 (Faul, Erdfelder, Lang, & Buchner, 2007).

165 To be included in the study, participants were required to have one or more children. The
166 final sample comprised 18 males (8.5%) and 194 females (91.5%). A large proportion of
167 participants (72.1%) had one to two children, with 27.9% of participants having three or more
168 children. The majority of participants held a bachelor's degree or higher ($n=120$, 56.6%). A
169 small proportion ($n=34$; 16%) of participants had medical training.

170 Measures

171 The online self-report questionnaire battery consisted of 116 questions. All participants in
172 the study completed a pre-intervention questionnaire that included a variety of sociodemographic
173 and illness exposure measures. The sociodemographic variables collected included sex, age,
174 number of children, age of participant at birth of first child, parental country of birth, language
175 spoken at home, and previous allied health training. The illness exposure variables measured
176 included history of personal PPD, history of personal mental illness, family member/friend
177 history of PPD, family member/friend history of mental illness, and current confidante/s to

178 discuss mental health concerns. Familiarity with PPD was measured with one question “Have
179 you personally experienced postnatal depression?” answered either as 0 (*No*) or 1 (*Yes*).

180 **Personal and perceived PPD stigma.** Personal and perceived PPD stigma was measured
181 using the Depression Stigma Scale (DSS; Griffiths et al., 2004) with the wording modified to
182 include the word “postnatal” Postnatal was used rather than postpartum as the former was
183 considered a better match to then community knowledge. The 18-item scale assesses
184 stigmatising attitudes and beliefs toward individuals with PPD and consists of two subscales:
185 personal stigma and perceived stigma. The *personal stigma* subscale assesses the participant's
186 own attitudes towards individuals with PPD (9 items: e.g., “People with postnatal depression are
187 unpredictable”), while the *perceived stigma* subscale assesses the participant’s perception of the
188 attitudes of others to individuals with PPD (9 items: e.g., “Most people believe that people with
189 postnatal depression are unpredictable”). Items on each of the subscales are rated on a 5-point
190 Likert scale ranging from 0 (*strongly disagree*) to 4 (*strongly agree*). A total scale score is
191 calculated by summing item scores, with total scale scores ranging from 0 to 72. Higher scores
192 are indicative of greater stigma. The two subscales have been reported as having moderate to
193 high internal consistency ($\alpha=.72$ to $.82$; (Griffiths et al., 2008; Griffiths et al., 2004), and
194 moderate test–retest reliability (Griffiths et al., 2004). In the present study, a moderate level of
195 internal consistency was attained, with a Cronbach's alpha of $.65$ for personal PPD stigma and
196 $.87$ for perceived PPD stigma.

197 **Attitudes towards help-seeking.** Attitudes towards help-seeking for treatment of a
198 mental health issue was assessed using the Inventory of Attitudes toward Seeking Mental Health
199 Services Scale (IASMHS; (Mackenzie, Knox, Gekoski, & Macaulay, 2004). The IASMHS is a
200 24-item instrument that measures beliefs about seeking professional help for mental health

201 problems. Items are presented on a 5-point Likert scale ranging from 0 (*strongly disagree*) to 4
202 (*strongly agree*), with high scores reflecting more positive attitudes. The scale comprises three
203 subscales: psychological openness (8 items: e.g., “Psychological problems, like many things,
204 tend to work out by themselves”); help-seeking propensity (8 items: e.g., “I would want to get
205 professional help if I were worried or upset for a long period of time”); and indifference to
206 stigma (8 items: e.g., “Having been mentally ill carries with it a burden of shame”). Higher total
207 scores indicate a more positive attitude toward seeking help. In the current study, a moderate
208 level of internal consistency was attained, with an alpha of .83 for psychological openness, .74
209 for help-seeking propensity, and .86 for indifference to stigma.

210 **Intervention Groups**

211 Using Qualtrics software, participants were randomly assigned to one of four intervention
212 groups.

213 **Experimental factsheet group.** Participants in this group were shown a digital factsheet
214 written by PANDA and used with permission from the Chief Executive Officer (B. Horton;
215 personal communication, March 25, 2014). The factsheet spanned two pages and contained
216 information outlining the contributing factors, common symptoms, and potential treatments of
217 PPD.

218 **Control factsheet group.** Participants in this group were shown an electronic factsheet
219 compiled by the Raising Children Network (2006) and used with permission from the secretary
220 of the network (Network Secretary, personal communication, April 2, 2014). The factsheet
221 contained information about parenting, the challenges of being a parent, and tips to deal with
222 parenting difficulties. The factsheet was designed to be generic, therefore to control for the

223 effects of the term postpartum depression used in the experimental factsheet group, the control
224 group's factsheet did not contain any references PPD.

225 **Experimental documentary group.** Participants in this group were required to view a
226 documentary produced by PANDA and used with permission (B. Horton; personal
227 communication, March 25, 2014). The documentary ran for 8min 38sec and outlined the burden
228 of PPD, gave real-life experiences of sufferers of PPD and their families, and included insights
229 into the illness from experts and health professionals.

230 **Control documentary group.** Participants in this group were required to view a
231 documentary comprising five "Meet the Families" video clips taken from the Raising Children
232 Network website (www.raisingchildren.net.au). These clips were used with permission (Network
233 Secretary, personal communication, April 2, 2014). The duration of the documentary was 7min
234 55secs and depicted the stories of five families and their experiences of raising children. To
235 control for the effects of the term postpartum depression used in the experimental documentary
236 group, this documentary did not contain any references to PPD.

237 **Procedure**

238 Ethical approval for the study was obtained from an Australian university's ethics
239 committee (Approval Number: HE14-154). A pilot study was implemented to check for clarity
240 of questions and the effects of question order. Three questions were reworded when they were
241 identified as being difficult to comprehend. No order effects were found for question order and
242 thus question presentation remained unchanged.

243 Potential participants were recruited on social networking sites (e.g., Facebook), online
244 forums (e.g., Reddit), and the university's online learning platform. The study was administered
245 through Qualtrics (Provo, UT), a secure online survey site. Participants were provided with an

246 information sheet fully informing them of the purpose of the study. They were then advised that
247 their responses were anonymous and that withdrawal from the study was permitted at any time
248 without consequence. Participants were also informed that activation of the “Proceed to study”
249 button constituted their informed consent.

250 Participants were asked demographic and illness exposure questions before the DSS and
251 IASMHS were presented. Employing a randomised control trial study design, participants were
252 randomly assigned to one of the four intervention groups. At the conclusion of the intervention,
253 participants were once again required to complete the DSS and IASMHS. At the close of the
254 survey, participants were thanked for their time and invited to enter an optional prize draw for a
255 chance to win an AUD\$50 iTunes gift card. Participants were then redirected to the PANDA
256 website where they could find further information about PPD.

257 **Manipulation Checks**

258 At the end of the intervention, participants were asked three questions about the
259 intervention: “How effective were the resources in improving your knowledge and understanding
260 of postnatal depression?”, “How effective were the resources in improving the likelihood that
261 you would seek professional help for a psychological problem?”, and “How effective were the
262 resources in improving the likelihood that you would encourage others to seek professional help
263 for a psychological problem?”. These questions were answered on a scale from 1 (*resources*
264 *were poor*) to 5 (*resources were excellent*). Three one-way ANOVAs showed that the two
265 experimental groups were rated significantly ($p < .05$) higher than the two control groups on all
266 three questions by the participants.

267

Results

268 Statistical Analysis

269 Statistical analyses were performed using SPSS version 24. Missing values were replaced
270 using the replace missing values, series mean method. Selected questions were reverse scored in
271 line with measurement requirements. As all assumptions of normality were met, raw data was
272 employed in the following analyses. A one-way analysis of covariance (ANCOVA) was used to
273 examine the impact of intervention groups on personal and perceived PPD stigma and help-
274 seeking behaviour scores. Pre-intervention levels of PPD stigma and help-seeking were
275 employed as covariates.

276 Intervention

277 The ANCOVA showed that following the intervention, personal PPD stigma scores
278 differed between the four groups, $F(3,207)=3.05$, $p=.030$, partial $\eta^2=.04$. However, there were no
279 statistically significant pairwise comparison effects. Furthermore, Table 1 shows that the
280 intervention did not reduce personal PPD stigma.

281 The pattern of findings for perceived PPD stigma did not indicate a statistically
282 significant difference, $F(3,207)=2.19$, $p=.090$, partial $\eta^2=.03$. There were no significant pairwise
283 comparison and perceived PPD stigma increased from pre- to post-test, see Table 1.

284 The results for help-seeking propensity were not affected by the intervention,
285 $F(3,207)=1.15$, $p=.332$, partial $\eta^2=.02$, see Table 1.

286 Sex, Age, and Familiarity with PPD

287 Post-intervention personal PPD stigma was used in the following analysis, but results
288 were almost the same for pre-intervention personal PPD stigma. Males had higher personal PPD
289 stigma ($M=10.11$, $SD=4.75$) than females ($M=7.21$, $SD=4.50$), $t(210)=2.61$, $p=.010$, Hedges' $g =$

290 0.64, 95% CI [0.15, 1.13]. Age was associated with personal PPD stigma, $r(210)=-.18$, $p=.010$,
291 thus the older the participant the less their personal PPD stigma. Familiarity ($no=0$, $yes=1$) with
292 PPD was correlated with post-intervention perceived PPD stigma scores, $r(210)=.21$, $p<.01$ but
293 not with post-intervention personal PPD stigma scores, $r(210)=.01$, $p=.839$. Reclassifying
294 familiarity to include both personal familiarity and familiarity through friends or relations also
295 resulted in low correlations ($r = -.01$ and $r = .06$, respectively).

296 **Post hoc Analysis**

297 An additional analysis examining the relationship between personal familiarity and help-
298 seeking was conducted. An ANCOVA was used to examine whether there was a difference
299 between familiarity and attitudes towards help-seeking scores controlling for pre-existing
300 attitudes. Results revealed a significant effect of familiarity on attitudes towards help-seeking
301 scores, $F(1,209)=4.31$, $p=.039$, partial $\eta^2=.02$. Participants with a personal experience of PPD
302 had more negative attitudes towards help-seeking ($M=64.39$, $SD=12.28$) compared to
303 participants with no personal experience of PPD ($M=68.97$, $SD=12.37$).

304 **Discussion**

305 This study sought to examine how an education intervention would impact PPD stigma
306 and, more indirectly, help-seeking propensity.

307 **Education Intervention and Help-seeking**

308 It was hypothesised that an education intervention would significantly influence PPD
309 stigma scores. Specifically, that participants in the intervention groups (factsheet or video) would
310 have lower personal and perceived PPD stigma and higher help-seeking scores compared to the
311 control groups. Results, however, revealed that the intervention had no significant effect on PPD
312 stigma scores. These findings are inconsistent with previous findings (Corrigan et al., 2003;

313 Griffiths et al., 2004) demonstrating that educational interventions could significantly reduce
314 personal and perceived stigma. One reason for these inconsistent findings is that previously used
315 interventions tended to be more interactional. That is, participants were required to perform a
316 type of action. As participants in the present study were simply required to watch a video or read
317 a factsheet, they may not have engaged as much with the material. Another suggestion for these
318 inconsistent findings is that group sizes in previous studies tended to be much larger ($n=165$;
319 (Griffiths et al., 2004) than the present study ($n=53$). Future studies may benefit from including
320 several overt manipulation checks throughout the survey to confirm that the intervention groups
321 were successfully manipulated.

322 We anticipated that viewing a PPD documentary would lead to increased help-seeking
323 behaviours. Results showed that there was no significant effect of type of intervention on help-
324 seeking propensity.

325 **Sex and Age**

326 Consistent with previous research (e.g., Calear et al., 2011; Corrigan, 2004) males had
327 higher levels of personal PPD stigma than females. Additionally, we hypothesised that older
328 persons would have higher levels of personal stigma, however, this was not supported. While age
329 was associated with personal PPD stigma, the results indicated that the older the participant, the
330 *lower* their levels of personal PPD stigma. This result is inconsistent with previous research
331 conducted by (Corrigan et al., 2003) who found that older persons exhibited more personal
332 stigma towards individuals with depression. One explanation for these varied findings is that the
333 older aged participants in the current study may have had high levels of familiarity with PPD. It
334 is quite possible that their own child may have experienced PPD and this may have influenced
335 their personal PPD stigma levels.

336 **Familiarity**

337 Inconsistent with previous research, familiarity was positively correlated with perceived
338 PPD stigma scores rather than inversely (Corrigan, 2004; Griffiths et al., 2004). Unexpectedly,
339 participants who had personally experienced PPD had significantly higher perceived stigma
340 scores. The results of the current study suggest that individuals who have experienced PPD
341 expect that other people will hold higher levels of stigma towards people with PPD. Perceived
342 stigma has been shown to negatively affect help-seeking behaviours (Corrigan & Watson, 2002).
343 If those experiencing PPD do anticipate high levels of stigma in the community, this could
344 greatly impact their help-seeking behaviours, leading to cases of PPD being left undiagnosed and
345 untreated. An alternative explanation for these results could be that individuals who have
346 experienced PPD are quite sensitive about the topic and unwittingly overinflated the expected
347 negative attitudes of others.

348 Familiarity with PPD was not associated with the participants' own stigma towards
349 people with PPD (personal PPD). It is unclear why familiarity with PPD does not reduce the
350 participants' own stigma towards PPD. Any relationship between familiarity with PPD and
351 personal PPD stigma may be 'hidden' by the type of familiarity, thus future research may want
352 to ask questions that assess the type of familiarity in more detail than in the present study.

353 **Limitations and Future Research**

354 The participants were predominantly female and educated and this should be taken into
355 account when considering generalising the findings to the broader community. A larger sample
356 of males is needed to enable a reliable comparison with females given that males tend to have a
357 worse mental health literacy than females (Gibbons, Thorsteinsson, & Loi, 2015).

358 Further research is needed to fully understand the different types of stigma that are
359 associated with PPD and any social, sex, and age factors that may underlie it. Research of a
360 longitudinal nature is also required to investigate if changes in attitudes lead to changes in
361 behaviour. Of specific interest is whether a targeted intervention can effectively reduce personal
362 and/or perceived stigma levels and lead to a change in behaviour toward individuals with PPD.
363 Such interventions could include clear hospital guidelines such as have been successful in
364 increasing individuals' psychological wellbeing (Basile & Thorsteinsson, 2015).

365 **Conclusions**

366 It is apparent that stigmatising beliefs and attitudes regarding PPD do exist in the
367 parenting community. Stigma towards people with PPD (personal stigma) was predicted by
368 being male and being younger. Personal familiarity with PPD increased people's expectations
369 that there would be stigma towards those with PPD. The stigma intervention was not effective in
370 the present study suggesting that such interventions need to be developed differently. It may be
371 appropriate to develop a broader-based education program targeting attitudes, disorder
372 characteristics, and effects of stigma for the general parenting community.

373

374

Ethics approval and consent to participate

375

Ethical approval for the study was obtained from an Australian university's ethics

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committee (Approval Number: HE14-154) and all participants provided their informed consent.

377

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Not applicable.

379

Conflicts of Interest

380

The authors declare that they have no competing interests.

381

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Table 1 (on next page)

Means and Standard Deviations for the Postpartum Depression Scale by Experimental Condition

1 Table 1

2 *Means and Standard Deviations for the Postpartum Depression Scale by Experimental*3 *Condition*

Measure	Condition			
	Experimental		Experimental	Control
	video documentary	Control video documentary	factsheet	factsheet
<i>n</i>	42	50	58	62
Pre-intervention Personal	6.21 (4.37)	7.12 (4.81)	6.48 (4.38)	6.92 (4.01)
Post-intervention Personal	6.31 (4.36)	7.39 (4.81)	7.79 (4.64)	7.97 (4.47)
Pre-intervention Perceived	17.64 (5.05)	18.04 (7.01)	16.48 (7.58)	16.81 (6.59)
Post-intervention Perceived	18.29 (5.33)	18.90 (6.57)	16.08 (7.77)	17.65 (6.71)
Pre-intervention help-seeking propensity	2.96 (0.57)	2.87 (0.52)	2.96 (0.54)	2.87 (0.49)
Post-intervention help- seeking propensity	3.04 (0.48)	2.85 (0.55)	2.97 (0.65)	2.89 (0.53)

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