

Differential effects of intuitive and disordered eating on physical and psychological outcomes for women with young children

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1 **Differential Effects of Intuitive and Disordered Eating on Physical and**
2 **Psychological Outcomes for Women with Young Children**

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Abstract

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Objectives: Pressure to lose weight can increase the risk of developing disordered

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eating behaviours, negative body image and depressive symptomatology. Eating

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intuitively may counteract these negative outcomes. This research examined the unique

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relationship between intuitive eating and disordered eating on body mass index (BMI),

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body image and depressive symptoms for women of young children. **Methods:** A

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survey of women with a child aged between six and 48 months, included the Intuitive

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Eating Scale, Eating Attitudes Test-26, Body Shape Questionnaire and Edinburgh

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Postnatal Depression Scale. Multivariate analysis of variance (MANOVA) was

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conducted as an omnibus test to estimate the effect of intuitive and disordered eating on

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BMI, negative body image and depressive symptoms. **Results:** Of the 419 sample (*M*

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age = 32.06), 32% were classified with disordered and 32% with intuitive eating.

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MANOVA and regression analysis found disordered eating positively associated with

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depressive symptoms, ($\beta = 0.303$) and negative body image ($\beta = 0.318$). Intuitive eating

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was associated with lower depressive symptoms ($\beta = -0.183$) and negative body image

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($\beta = -0.615$). Disordered eating ($\beta = -0.194$) and intuitive eating ($\beta = -0.586$) both

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contributed to lower BMI, with the association stronger for intuitive eating.

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Conclusion: The early parenting period involves a high risk for developing disordered

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eating behaviours. Eating patterns are modifiable factors, illustrating the potential for

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positive and preventive health outcomes through adopting intuitive eating behaviours.

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There is an opportunity for healthcare professionals to promote physical and

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psychological health including for women in the early parenting period.

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Keywords: Intuitive Eating; Body Image; Depression; Dieting; Postpartum

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Significance

While many studies examine the effect of intuitive and disordered eating on Body Mass Index (BMI), body image and depressive symptoms in young women, the unique relationship between intuitive eating and disordered eating on physical and psychological outcomes is not yet understood in the early parenting period. Women with young children are at high risk of disordered eating, which can cause a decline in psychological wellbeing for women in the early parenting period. This study examines the unique relationship between intuitive and disordered eating in this cohort of women at risk of impaired physical and psychological health.

64 **Differential Effects of Intuitive and Disordered Eating on Physical and**
65 **Psychological Outcomes for Women with Young Children**
66 **Objectives**

67 Women in Western societies are under immense pressure to be thin. A reprieve from
68 this is during pregnancy, when changes in a woman's body shape and size are accepted
69 (Shloim et al., 2015) and weight loss is not recommended. However, once an infant is born,
70 women often feel pressure to return to their pre-pregnancy size and shape (Silveira et al.,
71 2015). This thin-ideal is exacerbated by messages in the media and comparisons to celebrities
72 who seemingly lose weight easily post-pregnancy (Williams et al., 2017). Postpartum weight
73 retention increases the risk of body image dissatisfaction (Bergmeier et al., 2020), depressive
74 symptomatology (Hartley et al., 2018), and disordered eating behaviours (Rodgers et al.,
75 2018).

76 Disordered eating refers to maladaptive eating behaviours focused on body image
77 dissatisfaction (Linardon & Mitchell, 2017). Although the terms disordered eating and eating
78 disorders are often used synonymously, they are different. While disordered eating
79 incorporates some of the behaviours exhibited in eating disorders, these behaviours are
80 displayed with lesser frequency or severity. Disordered eating has been identified as a
81 precursor and risk factor to the onset of an eating disorder (Toni et al., 2017). However, the
82 rate of occurrence in the general population remains uncertain.

83 In contrast, the reported pervasiveness of eating disorders varies, with prevalence
84 rates ranging between 8% and 13% in adolescent and adult women (Cheng et al., 2019).
85 Prevalence may decrease during pregnancy with between 5% and 7.5% of women affected
86 (Easter et al., 2015), but appears to increase again during the postpartum period, impacting
87 between 13% and 19% (Pettersson et al., 2016). Binge-eating disorder appears to be the most

88 prevalent eating disorder in women during pregnancy and postpartum, followed by bulimia
89 and anorexia (Knoph et al., 2013; Martínez-Olcina et al., 2020).

90 Clinical diagnoses of eating disorders are relatively rare with disordered eating more
91 common (Reba-Harrelson et al., 2009). Nevertheless, research suggests rising prevalence and
92 being more common than previously thought amongst pregnant women (Galmiche et al.,
93 2019). Failing to address such problems at these life stages may result in women developing
94 severe clinical disorders at a time characterised by high stress. While the end of pregnancy
95 and early postpartum are high-risk periods for the triggering or worsening of disordered
96 eating, few studies have explored eating disorders in the early parenting period (Baskin &
97 Galligan, 2019).

98 To lose post-pregnancy body weight, many women restrict foods or food groups
99 (Leahy et al., 2017). These interventions are considered ineffective for long term weight loss
100 and can lead to disordered eating behaviours (Rodgers et al., 2018). Non-dieting approaches
101 that focus on health gains have been proposed as more effective methods for long term
102 weight loss, improved body satisfaction and restrained eating behaviours (Khasteganan et al.,
103 2019). Intuitive eating is a non-dieting approach that may provide women with a healthier
104 approach. Intuitive eating involves accepting body shape and size, listening to the body's
105 hunger and fullness cues, removing weight-focused thinking and eating what nourishes both
106 the body and the mind (Wilson et al., 2020). It is associated with improved eating patterns,
107 higher levels of self-esteem and lower levels of depression (Lee et al., 2020) and positive
108 physiological health outcomes including lower Body Mass Index (BMI) during and following
109 the postpartum period (Leahy et al., 2017).

110 Sub-clinical behaviours such as chronic dieting, fasting and other maladaptive
111 practices fall along a continuum, differing in frequency and severity relative to clinically

112 diagnosed eating disorders (Smolak et al., 2013). The eating disorder continuum suggests that
113 intuitive eating and eating disorder symptomatology are opposite poles of the same construct,
114 implying that an increase in one set of behaviours will correspond to a decrease in the other.
115 However, findings by Tylka and Wilcox (2006) suggest intuitive eating and disordered eating
116 are separate, albeit related constructs that have differing impacts and outcomes. No other
117 studies have explored this question.

118 Recent research has found associations between disordered eating during pregnancy
119 and depression, anxiety and restrained eating attitudes amongst in the early parenting period.
120 This suggests those with mental health symptoms are at higher risk for disordered eating
121 attitudes, which may increase risk involving restrained eating attitudes. (Baskin & Galligan,
122 2019). Other research indicates body image satisfaction, BMI, and depression are significant
123 predictors of intuitive eating (Lee et al., 2020). But there has been limited investigation of the
124 incidence or prevalence of disordered eating in the early parenting period suggesting a
125 limited understanding of the mechanisms that underpin disordered eating and its impact
126 (Bannatyne et al., 2019).

127 Over 350 million people worldwide experience symptoms of depression (World
128 Health Organization, 2017) with depression impacting between 13% to 19% of all women in
129 the early parenting period (Lewis et al., 2017). Intuitive eating is associated with positive
130 emotional functioning in women and not using food to cope with emotions (Tylka et al.,
131 2019). Research on the early parenting period is limited (Pettersson et al., 2016), however
132 evidence suggests a positive association between disordered eating and postpartum
133 depression (Rodgers et al., 2018). Similarly, eating attitudes, dietary patterns and food intake
134 have been found to influence maternal depression (Khan et al., 2020; Opie et al., 2020).
135 Young college-aged women who eat intuitively are happier with their bodies, have higher

136 self-esteem and are less likely to eat when emotional, stressed or tired. They also show higher
137 positive mental health and exhibit lower rates of disordered eating (Linardon & Mitchell,
138 2017; Wilson et al., 2020). These findings suggest that intuitive eating could be beneficial in
139 reducing disordered eating behaviours, and decrease poor mental health outcomes, in women
140 with young children.

141 No studies have examined the relationship between intuitive and disordered eating
142 and physical and psychological outcomes in the early parenting period. Using a multivariate
143 approach, this study explored the unique relationship between both intuitive and disordered
144 eating on physical (BMI) and psychological outcomes (body image and depressive
145 symptoms). As indicated, debate exists regarding whether the contrasting eating styles
146 represent opposite ends of a continuum. Accordingly, a subsidiary goal was to measure the
147 degree of any negative association between these two eating styles and to assess the degree to
148 which they have unique or contrasting relationships with external outcomes.

149 **Methods**

150 Ethics approval was gained from the **name of university removed for**
151 **deidentification** Human Research Ethics Committee H17/04-061.

152 *Research Design*

153 A cross-sectional research design was conducted using the Strengthening the
154 Reporting of Observational Studies in Epidemiology (STROBE) framework (von Elm et al.,
155 2007).

156 *Procedure and Participants*

157 Women over 18 years, with a child between six and 48 months, were invited to
158 complete an anonymous online survey through Facebook. All participants gave informed

159 consent before participating. Women with children younger than six months were excluded
160 as this initial breastfeeding period was considered a confounding factor in maternal eating
161 behaviours (Ventura & Teitelbaum, 2017). Participants were recruited using snowball
162 sampling with no limitations on the country of residence. Permissions were granted by the
163 administrators of ‘Mums and Bubs’ Facebook pages to post invitations to the survey.
164 Participants were asked to respond to survey questions concerning their experiences
165 following the birth of their youngest child with no offer of incentives. An a priori G*Power
166 calculation using 85% power and a medium effect size established N = 178 as the appropriate
167 study sample size.

168 *Materials*

169 *Participant Characteristics*

170 Participant demographic characteristics including age (years), marital status
171 (partnered, unpartnered), income (< \$600 AUD, \$600 to \$2000 AUD, > \$2000 AUD per
172 week), employment (employed, unemployed) and education (high school or less, trade or
173 university degree or higher) were collected. Respondents also reported their height
174 (centimetres) and body weight (kilograms) before their first pregnancy, most recent
175 pregnancy (if more than one child) and at the time of completing the survey. Height and
176 weight were used to calculate BMI at each time point.

177 *Disordered Eating*

178 The 26-item Eating Attitudes Test (EAT-26; Garner et al., 1982) was used to
179 ascertain the presence of disordered eating behaviours. This assesses food restriction
180 behaviour, control of eating behaviours and attitudes towards the pursuit of thinness.
181 Response items were measured on a six-point Likert scale: 3 (always) to 0 (never). Items
182 were totalled and averaged to provide an overall eating attitudes score, with lower scores

183 (less than 20) suggesting negative eating attitudes. Prior studies have indicated that the EAT-
184 26 has satisfactory discriminant validity in measuring symptoms of disordered eating
185 (Tokatly Latzer et al., 2018) and has high reliability (Garner et al., 1982). Cronbach's alpha in
186 this study was .86.

187 *Intuitive Eating*

188 The 28-item Intuitive Eating Scale (IES; Hawks et al., 2005) assessed participants'
189 propensity to eating intuitively or restricting foods to lose weight. This test assesses an
190 individual's ability to: rely on hunger and satiety cues, allow unconditional permission to eat
191 when hungry, and nourish the body. Response items were measured on a five-point Likert
192 scale: 1 (strongly agree) to 5 (strongly disagree). Items were totalled and averaged to provide
193 an overall intuitive eating score with higher scores suggesting greater intuitive eating. Prior
194 studies provide evidence of good reliability ranging from .56 to .85 (Hawks et al., 2005), and
195 the scale has been validated in research in adult women (Linardon & Mitchell, 2017; Wilson
196 et al., 2020). Cronbach's alpha in this study was .91.

197 *Body Image*

198 A 16-item short form of the Body Shape Questionnaire (BSQ16A; Evans & Dolan,
199 1993) was used to measure body image. This scale measures dissatisfaction with weight and
200 shape, desire to lose weight and fear of gaining weight. Response items were measured on a
201 five-point Likert scale: 1 (never) to 5 (always). Scores range from 16 to 80 with higher scores
202 suggesting greater body image dissatisfaction. The BSQ16A has strong correlations with the
203 original 34-item scale ($r = .99$) and evidence of excellent internal consistency ($\alpha = .91$ to $.94$)
204 (Gjerdingen et al., 2009) and has been validated in research in adult women (Wilson et al.,
205 2020). Cronbach's alpha in this study was .95.

206 *Depressive Symptomatology*

207 The 10-item Edinburgh Postnatal Depression Scale (EPDS; Cox et al., 1987), was
208 used to measure depressive symptomatology and emotional distress. Response items were
209 measured on a four-point Likert Scale with varied responses for each question. Scores range
210 from 0 to 30, with higher scores suggesting possible depression symptoms. Strong internal
211 consistency has been reported in the EPDS ($\alpha = .90$) (Silveira et al., 2015) and has been
212 validated in research in adult women beyond the immediate postpartum period (Thorpe,
213 1993). Cronbach's alpha in this study was .87.

214 *Data Analyses*

215 A significance threshold of $p < .01$ was used as this was a cross-sectional dataset with
216 relatively good power to detect expected effects. Following checks that variables were
217 approximately normal, Pearson bivariate correlations were calculated, and a multivariate
218 analysis of variance (MANOVA) was conducted as an omnibus test to estimate the effect of
219 intuitive and disordered eating on the three outcome measures, BMI, depressive symptoms
220 and negative body image. This was followed by three univariate regression models on each
221 outcome, using intuitive and disordered eating as predictors. No other covariates were
222 included in the model. Post-hoc univariate multiple regressions were conducted to investigate
223 the effects of each eating style on each outcome separately. The multivariate regression is
224 functionally equivalent to a path model with 2x3 causal effects, and correlated inputs and
225 outputs. Equivalent results were obtained using a path model, using the *lavaan* package in the
226 R statistical programming environment. Both standardised (using mean zero, unit variance
227 transformed variables) and unstandardised effects are presented. As the data was cross-
228 sectional, any interpretation of the causal role of eating style the outcomes rest on theoretical,
229 rather than statistical grounds.

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Results

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The study featured a cross-sectional sample of 419 women between 19 and 52 years ($M = 32.06$, $SD = 5.03$) with a child between six and 48 months ($M = 1.93$, $SD = 1.06$).

Missing values were assigned if women entered their child's age instead of their own age ($n=11$), or did not disclose their weight ($n=15$). All other data were included in the analysis.

Descriptive statistics (Table 1) indicate that 85% of participants were partnered, 20% had household income $> \$2000$ a week, 81% had a high school education or higher, and 57% were employed. As classified by the World Health Organization (2000) standardised BMI cut-offs, 62% had a healthy BMI ($>18.5 \text{ kg/m}^2$ & $< 25 \text{ kg/m}^2$) before the birth of their first child ($n=257$), 51% had a healthy BMI after their last child ($n=194$), and 40% currently had a healthy BMI ($n=165$). Overall, 32% of women identified as having disordered eating patterns ($M = 16.72$, $SD = 9.79$, $n = 136$), 32% also identified as having intuitive eating patterns ($M = 3.11$, $SD = 0.61$, $n = 127$), 71% reported body image dissatisfaction ($M = 50.69$, $SD = 18.6$, $n = 299$), and 32% identified as having postnatal depression ($M = 15.96$, $SD = 10.9$, $n = 136$).

INSERT TABLE 1 and 2 HERE

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The MANOVA revealed significant correlations between all variables (Table 2), with intuitive eating having a negative association with each of the outcomes, and disordered eating have a positive association with each outcome. The two eating styles were moderately negatively correlated with each other, and moderate positive associations were found for each of the outcomes. The MANOVA revealed a significant omnibus multivariate effect for both intuitive eating, $F(3,399) = 280.6$, $p < 0.01$, and disordered eating $F(3,399) = 43.65$, $p < 0.01$. Pillai's trace indicated that the omnibus effect size for intuitive eating (0.68) was significantly larger than for disordered eating (0.25). Table 2 summarises the three univariate regression models with unstandardised beta coefficients. Figure 1 shows the standardised beta

254 coefficients, illustrating the relative size of the effects for both eating styles. Disordered
255 eating was moderately positively related to both depressive symptoms and negative image,
256 whereas intuitive eating had larger effects in the negative direction. Both disordered eating
257 and intuitive eating had unique effects contributing to lower BMI. However, the effect for
258 intuitive eating was significantly larger in magnitude.

259 INSERT FIGURE 1 AND TABLE 3 HERE

260 **Conclusions for Practice**

261 This is the first study to measure the differential effects of intuitive and disordered
262 eating on physical and psychological outcomes in women in the early parenting period. This
263 study supports the findings from Tylka and Wilcox (2006) that intuitive eating and disordered
264 eating are not opposite constructs on a single continuum, but are separate, albeit related
265 constructs, that have differential effects according to context.

266 The results provide evidence of differential, independent effects for intuitive eating
267 and disordered eating on the physical and psychological outcomes considered. Of particular
268 note is the finding that both intuitive eating and disordered eating had a negative impact on
269 BMI (meaning that lower BMI was associated with greater levels of both intuitive eating and
270 disordered eating). Although these findings do not demonstrate a direct causal relationship,
271 they are consistent with the premise that intuitive eating may be an effective way of lowering
272 BMI for women in the early parenting period.

273 Intuitive eating had significant negative associations with depressive symptomatology
274 and negative body image, while disordered eating had significant positive associations. These
275 results align with earlier studies (Rodgers et al., 2018) and indicate that postpartum women
276 who display disordered eating behaviours do experience lowering of their BMI, but this is
277 accompanied by increases in depressive symptomatology and higher negative body image.

278 Conversely, our results suggest that women with young children who engage in intuitive
279 eating behaviours, experience a greater reduction in BMI, than women with disordered eating
280 patterns, and this change is accompanied by less depressive symptomatology and
281 improvements in body image. These findings are consistent with other studies which have
282 provided evidence that intuitive eating interventions are effective in improving physical and
283 psychological health outcomes across a woman's lifespan (Ledoux et al., 2021; Wilson et al.,
284 2020). Encouraging women to pursue intuitive eating during a time when focus shifts from
285 the self to a child may have a lasting impact on their physical and psychological health
286 (Wilson et al., 2020).

287 The cognitive styles associated with depression interfere with the caregiving
288 relationships, affecting behavior in parent-child interactions (Humphreys et al., 2018). As
289 such, adherence to intuitive eating may translate to improvements in the eating behaviours,
290 health, growth and development of children (Martini et al., 2020). The findings of our study
291 lend additional support to the need for longitudinal research of the impacts of different eating
292 behaviours over the life-course and the need to examine the impact of intuitive eating on
293 women post-pregnancy and their significant others/dependent children (Khan et al., 2020;
294 Opie et al., 2020). In line with findings from previous studies, it appears prudent that future
295 studies examine intuitive and disordered eating behaviours in primiparous versus multiparous
296 women and explores the impact of training maternal health professionals to promote intuitive
297 eating and recognise the symptoms and behaviours associated with eating disorders (Knoph
298 et al., 2013; Martínez-Olcina et al., 2020).

299 This cross-sectional study was not suitable for testing causation. The finding that
300 disordered eating was positively associated with depressive symptoms and negative body
301 image whilst intuitive eating was negatively associated with depressive symptoms and

302 negative body image could be bidirectional. For example, women in the early parenting
303 period with depression symptoms are at risk for disordered eating attitudes, which may
304 increase risk of poor dietary behaviours. This was a conclusion reached by Khan et al. (2020)
305 when examining the association between perinatal depression and dietary intake in a recent
306 systematic review. Our findings suggest that disordered eating in women with young children
307 is associated with depressive symptomology. Emerging evidence points to a strong
308 relationship between depressive symptoms and dietary intake in women with young children
309 (Khan et al., 2020). Based on alignment of the findings of the current study with previous
310 research, additional studies are required to ascertain the direction of any causal effects of
311 intuitive eating on physical and psychological outcomes (Linardon & Mitchell, 2017).

312 Snowball sampling has a number of disadvantages, including unknown sampling of
313 population size, and community bias. Future research should include a diverse set of
314 demographics, including older women, different ethnic backgrounds and different levels of
315 educational achievement. Given that participants in this study were asked to self-report height
316 and weight, participant BMI may not be an accurate reflection of actual BMI. As this study
317 was exploratory, future research should also seek to validate these findings and investigate
318 the causal effects and longitudinal effects of the physical and psychological outcomes of
319 disordered eating and intuitive eating from a greater population.

320 If results of a longitudinal study were as predicted, there would be great value in the
321 development of perinatal education programs that promote intuitive eating. The effect could
322 be a reduction in dichotomous thinking about food, reduction in the risk of body image
323 dissatisfaction, depressive symptomatology and disordered eating behaviours (Bergmeier et
324 al., 2020). Khan et al. (2020) outline that prenatal and early post-partum eating attitudes and
325 BMI have been shown to be predictors of depressive symptoms in the early parenting period.

326 Accordingly, identification of modifiable lifestyle risk factors which may contribute to
327 decreases in maternal depression are vital. Intuitive eating appears to offer a positive and
328 protective lifestyle modification in this respect which could be introduced at multiple stages
329 pre and post-natal.

330 The early parenting period provides an opportunity for implementing interventions
331 that promote positive physical and psychological wellbeing and engage a range of healthcare
332 professionals including midwives, obstetricians and paediatricians. Similar to pregnancy, the
333 early parenting period is a highly teachable time, providing an opportunity to utilise
334 behavioural strategies to promote positive behaviour change in women with young children
335 (Lim et al., 2020). These findings offer important considerations for practices supporting
336 nutrition and mental health education for women with young children. Interventions to
337 address intuitive eating in the early parenting period should include strategies that educate
338 women about childhood weight gain and feeding and optimise self-regulation of eating in
339 children (Tylka et al., 2015). Further research is also needed on the effective treatment of
340 maternal physical and mental health and the need to educate healthcare professionals who
341 provide care for women with young children who are at risk of disordered eating. Eating
342 patterns and associated improvements in the diet are modifiable factors, and these findings
343 illustrate the potential for increased positive and preventive health outcomes for women in
344 the early parenting period and their children through the adoption of intuitive eating
345 behaviours.

346

347 **Disclosure of Interests**

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349 public, commercial, or not-for-profit sectors.

350 **Conflicts of interest:** The authors declare that there is no conflict of interest.

351 **Author Contribution:** ML, SW & KB constructed the research questions and wrote the first
352 draft of the methods. ML collected the data. MB analysed the data & wrote the first draft of
353 the data analysis. ML & MB wrote the first draft of the results. ML & JM wrote the first draft
354 of the introduction and conclusion. SW & KB wrote the first draft of the discussion. All
355 authors reviewed and approved the final draft.

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