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1 TITLE

2 Association of prior depressive symptoms and suicide attempts with subsequent
3 victimisation - analysis of population-based data from the Adult Psychiatric Morbidity
4 Survey

5

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29

30 ABSTRACT (241):

31 Background: Symptoms of mental disorder, particularly schizophrenia, predispose to
32 victimisation. Much less is known about the relationship between depressive symptoms

33 and later victimisation in the general population, the influence of these symptoms on

34 *types* of subsequent victimisation, or the role of symptom severity. We investigated this in

35 nationally representative data from the UK. Methods: Data were from the Adult Psychiatric

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36 Morbidity Survey 2007. Multivariable logistic regressions estimated association between: a.
37 prior depressive symptoms, and b. prior depressive symptoms with suicide attempt, and
38 types of more recent victimisation. Gender-specific associations were estimated using
39 multiplicative interactions. Results: Prior depressive symptoms were associated with
40 greater odds of any recent intimate partner violence (IPV), emotional IPV, sexual
41 victimisation, workplace victimisation, any victimisation, and cumulative victimisation
42 (adjusted odds ratio (aOR) for increasing types of recent victimisation: 1.47, 95%
43 confidence interval (CI): 1.14, 1.89). Prior depressive symptoms *with suicide attempt* were
44 associated with any recent IPV, emotional IPV, any victimisation, and cumulative
45 victimisation (aOR for increasing types of recent victimisation: 2.33, 95%: 1.22, 4.44).
46 Limitations: Self-reported recalled data on previous depressive symptoms, may have
47 limited accuracy. Small numbers of outcomes for some comparisons resulted in
48 imprecision of these estimates. Conclusion: Aside from severe mental illness such as
49 schizophrenia, previous depressive symptoms in the general population are associated
50 with greater subsequent victimisation. Men and women with prior depressive symptoms
51 may be vulnerable to a range of types of victimisation, and may benefit from
52 interventions to reduce this vulnerability.

53

54 **KEYWORDS:** intimate partner violence; victimisation; depression; epidemiology; workplace
55 violence; sexual violence;

56

57 INTRODUCTION

58

59 Violence is a global public health challenge(1). While symptoms of mental disorders have
60 long been understood to be a potential consequence of violent victimisation, recent
61 research indicates such symptoms might also increase vulnerability to later victimisation(2,
62 3). However, much previous research has focused on mental disorders in help-seeking
63 populations (e.g. Christ, de Jonge (4), reviewed in (5), rather than symptoms of common
64 mental disorders, such as depressed mood and suicidality, occurring in people who may
65 not be seeking help. Victimisation can occur in a variety of settings, such as in the context
66 of an intimate relationship, or at the workplace. Victimisation can involve emotional or
67 sexual victimisation, as well as physical harm. However, there has been limited assessment
68 of potential associations of depressive symptoms with vulnerability to different types of
69 victimisation, or victimisation occurring in different settings. Previous studies of intimate
70 partner violence (IPV) in people with depressive symptoms have focused only on physical
71 IPV(6-8), without examining emotional IPV, which involves recurrent criticism, verbal

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72 aggression and threats, and coercive or controlling behaviour occurring within an intimate
73 relationship. There has also been limited focus on types of victimisation other than IPV,
74 such as sexual victimisation, defined by the World Health Organization as any sexual act
75 against a person using coercion(9), and workplace victimisation(10), defined by the
76 European Commission as incidents where persons are abused, threatened or assaulted in
77 circumstances related to their work(10). There is evidence that some individuals
78 experience a disproportionately greater occurrence of victimisation(11), and that different
79 types of victimisation are correlated(12). However, few studies have examined if depressive
80 symptoms increase risk of experiencing a *range* of victimisation types, whether there are
81 differences between types of victimisation in this association, or if depressive symptoms
82 increase vulnerability over a continuum of cumulative victimisation (that is, whether
83 association is similar when comparing those with no victimisation *vs.* one type of
84 victimisation, and those with one type of recent victimisation *vs.* two types of
85 victimisation, etc.). Experience of victimisation varies between men and women, with
86 women experiencing a greater burden of IPV, but studies suggesting greater physical
87 victimisation (specifically) among men(13). This indicates that there could be different but
88 overlapping risk factors for victimisation experienced by men, compared to women.
89 Depressive symptoms may also predispose to some types of victimisation more than
90 others. Feelings of fear, helplessness, and entrapment in IPV relationships may predispose
91 both to depressive symptoms and to further IPV victimisation(14). In contrast, depressive
92 symptoms may increase the likelihood of work absence, due to the influence of
93 depressive symptoms on motivation and the execution of job roles, thus resulting in lower
94 risk of workplace victimisation(15). It is possible therefore, that any greater likelihood of
95 workplace victimisation experienced by people with previous depressive symptoms is *less*
96 than that for IPV, because of the association of depressive symptoms with greater work
97 absence. Epidemiological studies on victimisation in mental illness have examined birth
98 cohorts (therefore only including individuals of a specific age)(16, 17), household surveys
99 of urban settings(18), and clinical samples(19), but have rarely evaluated nationally
100 representative data on depressive symptoms(20).

101

102 Therefore, there is a need for national population-based studies on what factors influence
103 vulnerability to a range of types of victimisation in people with depressive symptoms. Few
104 studies on increased IPV risk in depression have accounted for the shared correlation of
105 both depression(21, 22) and IPV in adulthood with childhood abuse(23, 24). It is also not
106 known whether any association between prior depressive symptoms and subsequent
107 victimisation is confounded by prior non-violent adverse life events, such as homelessness,

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108 running away from home, or by violent behaviour. Finally, there has been limited
109 assessment of possible bias introduced by differences in recall of prior traumatic events
110 between those with and without depression at the time of research interview.

111

112 In this study, we tested the relationship between prior depressive symptoms (occurring
113 more than one year ago) and recent victimisation in nationally representative data from
114 England. We hypothesised:

115

- 116 1. association between prior depressive symptoms and recent victimisation,
- 117 2. that greater severity of prior depressive symptoms, indicated by the report of
118 prior suicide attempt, would be accompanied by greater risk of recent victimisation, and
- 119 3. stronger association of prior depressive symptoms with recent IPV compared to
120 recent workplace victimisation.

121

122 **METHODS**

123 **Sample Details**

124 We analysed data from the 2007 Adult Psychiatric Morbidity Survey (APMS), which draws
125 on a representative sample of household residents in England(25). The survey was
126 commissioned by NHS Digital and carried out by the National Centre for Social Research
127 (NatCen) and University of Leicester. A multi-stage stratified probability sampling design
128 was adopted. The sampling frame was the Post Office's small user Postcode Address File
129 (PAF), covering private households in England. The first stage of sampling involved the
130 selection of primary sampling units (PSUs); the second involved selecting addresses within
131 PSUs. People living in communal establishments were not surveyed. When interviewers
132 made contact at an address, one resident aged 16 or over was randomly selected for
133 interview. The questionnaire was administered using a combination of face to face and
134 self-completion computer-assisted interviewing, covering physical health, mental health,
135 service use, religion, social capital, discrimination, violence, and abuse. Fieldwork took
136 place between October 2006 and December 2007 with 7403 adults.

137 **Ethical standards**

138 Ethical approval was obtained for APMS 2007 from Research Ethics Committees of the
139 National Research Ethics Service appropriate for non-clinical populations. The authors
140 assert that all procedures contributing to this work comply with the ethical standards of
141 the relevant national and institutional committees on human experimentation and with
142 the Helsinki Declaration of 1975, as revised in 2008.

143

144 **Measures**

145 *Prior depressive symptoms and prior suicide attempt*

146 Information on previous episodes of depression was collected in the Common Mental
147 Disorders section of the APMS questionnaire, and information on suicide attempts was
148 taken from the Suicidal Thoughts section. To ascertain prior depressive symptoms, we
149 used information from an item assessing any previous episodes of feeling sad, miserable
150 or depressed, and another item enquiring for the age the first of these episodes occurred.
151 We used this information and respondent age to derive a dichotomous variable to
152 indicate any prior depressive symptoms occurring a year or more ago. Information on
153 prior suicide attempt was gathered by asking participants if they had made an attempt to
154 take their own life prior to the last year. These variables were combined to create a three-
155 level variable for reporting: a. neither prior depressive symptoms nor prior suicide
156 attempt, b. prior depressive symptoms alone, and c. prior depressive symptoms with prior
157 suicide attempt.

158

159 *Recent victimisation events*

160 Self-completion items in the Domestic Violence and Abuse section of the APMS
161 questionnaire assessed recent IPV, in the form of experiencing, in the previous twelve
162 months, a partner or ex-partner:

- 163 - pushing, holding or pinning you down, or slapping you; choking or trying to strangle
164 you; using a weapon against you; or using some other kind of force against you (for
165 recent physical IPV); or
166 - threatening you with a weapon; threatening to kill you; or issuing threats causing fear
167 (for recent emotional IPV).

168 These were used to derive variables for any recent IPV, recent emotional IPV, and for
169 recent physical IPV. Recent sexual victimisation was assessed with self-report items
170 enquiring whether respondents had, in the previous twelve months, experienced any non-
171 consensual sexual touching or sexual intercourse, in the Stressful Life Events section of the
172 APMS questionnaire. Information on recent workplace victimisation was measured using
173 face-to-face interview data on recent experience of violence at work, with a reference
174 period of 6 months, in the Stressful Life Events section of the APMS questionnaire.
175 Victimization variables analysed in this study were not mutually exclusive. Based on these
176 variables we derived a binary indicator for recent victimisation of any type, and an
177 ordered categorical variable for number of different types of recent victimisation

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178 experienced. This score theoretically ranged from 0-4, however in the observed data
179 ranged from 0-3.

180

181 *Lifetime non-violent adverse life events*

182 Bereavement, separation, serious interpersonal difficulties, being sacked or made
183 redundant, joblessness/job-searching for longer than one month, or major financial crisis
184 were assessed by checklist(26). Based on this variable we created a binary variable
185 reflecting any non-violent adverse life events in the respondents lifetime (27). These items
186 were contained in the Stressful Life Events section of the APMS questionnaire.

187

188 *Childhood physical or sexual abuse*

189 Physical victimisation during childhood was assessed by asking whether the participant
190 had, before the age of 16, experienced severe physical beating by a stepparent, parent, or
191 carer. Sexual abuse was evaluated by asking respondents if they had experienced
192 someone talking in a sexual way to them without consent before the age of 16, if they
193 had experienced non-consensual sexual touching before the age of 16, or if they were
194 subject to non-consensual sexual intercourse before the age of 16. These items were used
195 to derive a binary variable reflecting childhood abuse.

196

197 *Covariates*

198 Age was measured in years and grouped into age groups of 16-24, 25-44, and 45 and
199 above for description, and included in regression models as a continuous variable. Gender
200 was dichotomised, and self-ascribed ethnicity classified into UK census categories, and
201 then further categorised into black, Asian, white British, white non-British, and mixed/other
202 categories for this analysis. Social class was classified according to the Office for National
203 Statistics National Statistics Socio-economic Classification (NS-SEC)(28), dropping the
204 military occupational category because of small numbers. Employment status at the time
205 of interview was grouped into unemployed or not unemployed. Marital status at interview
206 was categorised into single, married/cohabiting, divorced/separated, and widowed.
207 Highest educational qualification was classified into no qualifications, GCSEs (reflecting
208 schooling until around 16 years of age), A levels (schooling until 18 years of age) and
209 attaining a degree. A binary item measuring lifetime perpetration of violence was based
210 on asking participants whether they had ever assaulted or deliberately hit someone in the
211 context of physical fight(29). Drug use was measured by an item for use of an illicit drug
212 in the lifetime (illicit drugs included cannabis, amphetamines, cocaine, crack, ecstasy,
213 heroin, acid, magic mushrooms, tranquilizers, amyl nitrite, anabolic steroids, and glue), and

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214 hazardous use of alcohol in the previous year was measured using the AUDIT scale(30),
215 with a cut-off of 8. Neighbourhood deprivation was measured by linking the respondent's
216 postcode at interview to a publicly available census-derived deprivation index, the Index
217 of Multiple Deprivations (IMD) 2007. To limit identifiability of individual respondents, this
218 information was made available as a five-level variable, for the quintile of deprivation for
219 each respondent, based on their address. Information on current symptoms of depression
220 was collected using the revised clinical interview schedule (CIS-R)(31). Current depression
221 was identified using diagnostic criteria from the 10th International Classification of
222 Diseases(32).

223

224 **Analysis**

225 We examined distribution of prior depressive symptoms, and prior depressive symptoms
226 with suicide attempt (both reported to have occurred at least one year prior to interview),
227 and any recent IPV (in the last 12 months), recent emotional IPV (in the last 12 months),
228 recent physical IPV (in the last 12 months), recent sexual victimisation (6 months), recent
229 workplace victimisation (6 months), any recent victimisation and experiencing two or more
230 types of recent victimisation, by all analysed covariates, with counts and survey-weighted
231 proportions.

232

233 Based on the epidemiological literature, we conceptualised prior depressive symptoms,
234 prior suicide attempt, and later victimisation as potentially influenced by the following
235 potential confounders: age, gender, educational attainment, childhood abuse, use of drugs
236 and alcohol, lifetime non-violent adverse life event, and perpetration of violence,
237 presenting this as a directed acyclic graph(see Supplementary Material)(33). Other
238 possible socioeconomic confounders from the graph (marital status, social class, ethnic
239 group, income, and neighbourhood deprivation) were evaluated for inclusion based on
240 the amount of deviation from the unadjusted estimate for association between prior
241 depressive symptoms and recent victimisation, using a difference in the adjusted
242 association of 10% or greater compared to the crude estimate(34) to indicate evidence of
243 possible confounding(see table S4). On this basis educational attainment, childhood
244 abuse, lifetime non-violent adverse life event, violence perpetration, lifetime drug use, and
245 hazardous alcohol use were included in fully adjusted models, together with age and
246 gender.

247

248 Crude associations between each included covariate and each victimisation type were
249 estimated using survey-weighted logistic regressions. For multi-variable modelling, survey-

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250 weighted logistic regression analyses in Stata 14(35) were used to estimate associations
251 between prior depressive symptoms alone, and prior depressive symptoms with suicide
252 attempt, and any recent IPV, emotional IPV, physical IPV, sexual victimisation, workplace
253 victimisation, and any recent victimisation of any type. Ordinal logistic regression models
254 were used to estimate association between prior depressive symptoms alone, and prior
255 depressive symptoms with suicide attempt, and a greater number of types of recent
256 victimisation experienced. All models were estimated overall, and for men and women
257 using multiplicative interaction terms for gender, to derive male- and female-specific
258 estimates. In order to test for a trend in associations of victimisation types with prior
259 depressive symptoms alone, and prior depressive symptoms with suicide attempt,
260 likelihood ratio tests were used to test if a linear term provided better fit than an indicator
261 variable. We report these p-values for strength of evidence against the appropriateness of
262 including a linear term, based on the overall sample, for each victimisation type, in table
263 2. Final model estimates for covariates are reported in Supplementary Table S1.

264

265 Finally, we carried out sensitivity analyses. We examined the impact of missing data on
266 our results by comparing prevalence of victimisation outcomes in those included in the
267 analysis with those excluded due to missing data, stratified into those without previous
268 depressive symptoms, those with prior depressive symptoms without suicide attempt, and
269 those with previous depressive symptoms and suicide attempt. We also compared final
270 model estimates with estimates from fifteen imputed datasets, generated using multiple
271 imputation by chained equations, combining estimates from imputed datasets using
272 Rubin's rules(36). Our primary analysis was a complete case analysis. Model estimates
273 based on complete cases assume data is missing completely at random (MCAR). Briefly,
274 multiple imputation allows examination of the impact of missing data on model results,
275 under the assumption that missing data is related to variables that are observed in the
276 dataset(data missing at random, MAR), but cannot account for data which is missing due
277 to factors that are not observed in the data(data missing not at random, MNAR)(37). We
278 also estimated models restricted to data from those without current depression, in order
279 to examine a possible role for different recall accuracy for victimisation between those
280 with and without depression at the time of interview, and the influence of prior
281 victimisation on our results, by estimating models restricted to those without a history of
282 childhood abuse.

283

284 **RESULTS**

285

286 **Sample characteristics**

287 Table 1 describes counts and survey-weighted percentages on the study sample. The total
288 sample consisted of 7403 respondents, of whom 48.6% ($n=3197$) were male, 50% (4387)
289 were above 45, and 25.6% (2278) reported attaining no qualifications. The prevalence of
290 childhood abuse was 15.8% (1200). Around a quarter of the sample (24.1%, 1603),
291 reported hazardous use of alcohol, and a quarter (25.7%, 1637) reported lifetime drug
292 use. Nine tenths of the sample (92.2%, 6946) reported at least one lifetime non-violent
293 adverse life event. Lifetime perpetration of violence was reported by 18.2% of the sample
294 (1268). Diagnostic criteria for current depression were met by 3% of the total sample
295 (255). Data was complete on the analysed variables in 7068 (95%) of participants.

296

297 *Prior depressive symptoms and prior suicide attempt*

298 The overall prevalence of prior depressive symptoms (i.e. reported to have occurred at
299 least 12 months ago) was 33.5% (2498), and prior depressive symptoms with suicide
300 attempt, 2.3% (181). Respondents reporting prior depressive symptoms and prior
301 depressive symptoms with suicide attempt were more likely to be female. Childhood
302 abuse was more prevalent in those with previous depressive symptoms (19.8%, 490) and
303 prior depressive symptoms with suicide attempt (46.2%, 83) than those with neither prior
304 depressive symptoms nor suicide attempt (12.7%, 627). Hazardous use of alcohol was
305 more common among those with prior depressive symptoms (25.9%, 574) and prior
306 depressive symptoms and suicide attempt (53, 32.9%), than those with neither prior
307 depressive symptoms nor suicide attempt (976, 22.9%). Lifetime drug use was more
308 commonly reported in those with prior depressive symptoms (665, 31.2%) and prior
309 depressive symptoms with suicide attempt (87, 52.8%), than those with neither prior
310 depressive symptoms nor suicide attempt (885, 21.6%). Lifetime non-violent adverse life
311 events were more common in those with prior depressive symptoms (2400, 95.1%) and
312 prior depressive symptoms with prior suicide attempt (176, 97.1%), than those with
313 neither prior depressive symptoms nor suicide attempt (4370, 90.6%). Lifetime
314 perpetration of violence was more likely to be reported by people with prior depressive
315 symptoms (508, 21.6%), and those with prior depressive symptoms with suicide attempt
316 (70, 41.4%), compared to those without (690, 15.6%).

317

318 *Recent victimisation*

319 The prevalence of any recent IPV, recent emotional IPV, recent physical IPV, recent sexual
320 victimisation, and recent workplace victimisation, and any recent victimisation were all
321 greater among those with prior depressive symptoms, and among those with prior

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322 depressive symptoms with suicide attempt, than those with neither. For example, 19.1%
323 (28) respondents with prior depressive symptoms and suicide attempt reported any recent
324 victimisation, compared to 8.2% (169) of those with prior depressive symptoms only, and
325 5%(225) of those with neither depressive symptoms nor suicide attempt.

326

327 **Multivariable estimates for association of prior depressive symptoms, and prior** 328 **suicide attempt, with types of recent victimisation**

329

330 In relation to our first hypothesis, prior depressive symptoms were statistically associated
331 with all recent victimisation types in the overall sample, except recent physical IPV, before
332 adjustments (see table 2). After adjustment for potential confounders, prior depressive
333 symptoms alone remained associated with recent IPV (OR: 1.31, 95%CI: 1.01, 1.69), recent
334 emotional IPV (OR: 1.48, 95%CI: 1.12, 1.97), recent sexual victimisation (OR: 2.90, 95%CI:
335 1.37, 6.11), recent workplace victimisation (OR: 3.33, 95%CI: 1.37, 8.12), any recent
336 victimisation (OR: 1.43, 95%CI: 1.12,1.83), and cumulative victimisation (OR for a greater
337 number of types of recent victimisation: 1.47, 95%CI: 1.14, 1.89). After adjustment, prior
338 depressive symptoms with suicide attempts remained associated with any recent IPV (OR:
339 2.19, 95%CI: 1.19, 4.00), recent emotional IPV (2.44, 95%CI: 1.26, 4.75), recent sexual
340 victimisation (OR: 5.85, 95%CI: 1.51, 22.63), any recent victimisation (OR: 2.48, 95%CI: 1.38,
341 4.45), and cumulative victimisation (OR: 2.33, 95%CI: 1.22, 4.44). Tests for trend in
342 associations of prior depressive symptoms alone and prior depressive symptoms with
343 suicide attempt suggested a linear trend in the strength of associations for all outcomes
344 (see table 2), in support of our second hypothesis.

345

346 *Associations in men and women*

347 Confidence intervals for estimates in men and women overlapped, suggesting insufficient
348 statistical evidence for differences in association between men and women. Adjusted
349 associations of prior depressive symptoms alone with each victimisation outcome were
350 greater in magnitude among men, compared to women, with the exception of physical
351 IPV, where the OR for women was 0.87 (95%CI: 0.59,1.36) and men, 0.98 (95%CI:
352 0.56,1.70), and for workplace victimisation, where the OR for women was 3.59 (95%CI:
353 0.75, 17.19) and men, 3.23 (95%CI: 1.10, 9.48, table 2). Associations of prior depressive
354 symptoms with suicide attempt with each type of recent victimisation were stronger in
355 women than men for recent IPV, recent emotional IPV, recent physical IPV, and cumulative
356 victimisation, but stronger in men than women for recent sexual victimisation and any

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357 recent victimisation. Estimates for workplace victimisation were not produced due to low
358 numbers.

359

360 *Sensitivity analyses*

361 Estimates of association based on data restricted to those who did not report childhood
362 abuse and among those who did not meet diagnostic criteria for depressive at the time of
363 interview, were similar to our main results (table 3). Chi-squared comparisons did not
364 indicate significant differences in the prevalence of victimisation types among excluded
365 and included records, with the exception of recent sexual victimisation which was more
366 prevalent in excluded cases than those included ($p < 0.001$, Supplementary Table S2).

367 Estimates from multiple imputation did not differ in direction for any outcomes, but there
368 was some attenuation of most fully adjusted estimates (Supplementary Table S3).

369

370 **DISCUSSION**

371 *Summary of findings*

372 Prior depressive symptoms were associated with any recent IPV, emotional IPV, sexual
373 victimisation (all in the previous 12 months), workplace victimisation (in the previous 6
374 months), and cumulative recent victimisation, supporting our first hypothesis. Associations
375 of prior depressive symptoms with suicide attempt were greater in magnitude than prior
376 depressive symptoms alone, in support of our second hypothesis. Associations of prior
377 depressive symptoms with workplace victimisation were greater in magnitude than for
378 IPV, in disagreement with our third hypothesis. Although estimates for association
379 between prior depressive symptoms alone with recent victimisation were generally greater
380 in magnitude in men than women (with the exception of recent physical IPV, where
381 estimates for men and women were similar), the extent of this varied between types of
382 victimisation.

383

384 *Previous literature*

385 Our study extends analyses of APMS data demonstrating cross-sectional association
386 between IPV and psychiatric disorders (38), and that different types of victimisation may
387 be correlated over the lifecourse (39). Our findings accord with some evidence that
388 people with psychiatric disorders experience greater subsequent victimisation. However,
389 previous studies have focused on clinical populations with severe mental disorders(40, 41),
390 not sampled the general population for controls(33) (42), and not accounted for
391 perpetration (43-45). Lehrer et al(46) found association between depression and
392 subsequent physical IPV in American adolescent girls in nationally representative data.

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393 However, as well as limited representativeness for the general population, they also did
394 not account for drug use, perpetration, or socioeconomic information other than parental
395 education. In prospective data from an HIV prevention trial in Eastern Cape Province,
396 South Africa(47), depressive symptoms were associated with subsequent relationship
397 abuse in women, but not men. There were a range of adjustments made in the study,
398 however the study was focused on HIV-affected individuals, and emotional abuse was not
399 captured, which may explain weaker findings in men in this study. A study of nearly 500
400 pregnant women in Nicaragua(48) found crude association between depressive symptoms
401 and continued abuse, but reported frequencies only, and did not adjust for confounders.
402 A study in Uppsala, Sweden compared depressed adolescent females with controls on
403 psychosocial outcomes in adulthood, including physical and verbal IPV, adjusting for
404 socioeconomic disadvantage, parental conflict, and disruptive behaviour(7). This study
405 found IPV at follow-up was around 3 and a half times commoner in those with depression
406 at baseline, however this did not account for alcohol or drug use, and representativeness
407 was limited. In a study of rural schools in North Carolina, USA, Fohshee et al(6) found
408 depressed girls were 1.4 times more likely to report subsequent sexual victimisation, but
409 did not find this relationship in boys. We are unaware of examinations of association
410 between depressive symptoms and later sexual victimisation in general population data,
411 although studies have found higher occurrence of sexual victimisation towards people
412 with severe mental illness (49) (50).

413

414 Our finding that prior depressive symptoms predict workplace victimisation is consistent
415 with a small number of previous studies on workplace bullying(51). Finne et al(52) found
416 Norwegian workers with anxiety were more likely to report workplace bullying at follow-
417 up 5 years later, however statistical evidence was found for men, not women, consistent
418 with stronger associations found in our analysis in men compared to women. Kivimaki et
419 al(53) assessed the prospective relationship between workplace bullying and subsequent
420 depression in a Finnish occupational cohort, but also found unadjusted "reverse"
421 associations between depression at baseline and later depression, reporting that those
422 with depression were around 2.5 times more likely to report workplace bullying at follow-
423 up two years later. No studies have compared workplace victimisation and IPV as
424 outcomes in people with prior depressive symptoms, as far as we are aware.

425

426 *Strengths and limitations*

427 We examined our hypotheses in a large, nationally representative, general population-
428 based sample, allowing generalization of our findings to the English setting. Data was

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429 95% complete, and sensitivity analyses suggested limited impact of missing data on our
430 inferences. Association between prior depressive symptoms and recent victimisation was
431 evident even among those without childhood abuse, helping to limit the possibility of
432 reverse causality affecting our results. Our hypotheses focused on self-reported depressive
433 symptoms, rather than clinical depressive disorder, and our results should not be
434 generalized to clinical depressive disorders. The sampling frame did not include
435 institutional residents or homeless individuals, limiting generalizability. Assessment of prior
436 depressive symptoms, by asking if respondents had experienced episodes of feeling sad,
437 miserable or depressed more than one year ago, was imprecise, and could have been
438 more subject to differences in recall sensitivity between participants. No information was
439 available on number, duration, and severity of prior depressive symptoms, although
440 stronger associations for prior depressive symptoms with suicide attempt could indicate a
441 dose-response relationship with severity of prior depressive symptoms. Although our data
442 was collected at a single time point, variables investigated were separated in time.
443 Nevertheless, information on prior depressive symptoms and IPV could have incorporated
444 measurement error – accuracy of reporting IPV may have differed between those with and
445 without prior depressive symptoms. There were small numbers of participants reporting
446 recent sexual victimisation, and workplace victimisation, leading to imprecise estimates,
447 and these associations should be assessed in samples with higher frequency of these
448 outcomes. Self-report information on prior depressive symptoms may also have
449 introduced error - individuals who had frequent experiences of IPV and other types of
450 trauma could have been more sensitive to recalling or describing prior depressive
451 symptoms, or suicide attempts. Risk factors for sexual or workplace victimisation and IPV
452 which were also causes of prior depressive symptoms could have been left out of models
453 because they were not measured, or incompletely handled due to poor measurement. For
454 example, we were not able to use information on prior experiences of IPV or sexual
455 victimisation in adulthood, although we were able to adjust for childhood abuse.
456 Systematic differences in probability of over-reporting IPV have been reported between
457 men and women(54), although mechanisms underlying this, such as the reporting of IPV
458 by men as a way to excuse their own violent behaviour, remain speculative(55). In
459 particular, although it is theoretically possible that we over-estimated the prevalence of
460 IPV in men because of over-reporting of perpetration type events, the survey data did not
461 contain information on IPV perpetration, limiting our ability to test this.

462

463 *Explanations*

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465 Typically the consistent overlap between mental disorders and victimisation has been
466 explained by a causal relationship between victimisation and later mental disorder.
467 However, a reverse relationship is also possible, and has been relatively under-explored in
468 the literature. Depressive symptoms could increase vulnerability in social and workplace
469 situations and influence a person's ability or motivation to remove themselves from risky
470 environments. Individuals with evident depressive symptoms, or suicide attempt, may be
471 considered easy targets by potential perpetrators, due to their perceived vulnerability or
472 lack of credibility in the event they report victimisation- this has not been researched, as
473 far as we are aware. Depressive symptoms are also associated with increased use of
474 alcohol and drugs, and longitudinal studies are clearly required which measure intervening
475 drug/alcohol use, in order to clarify the role of substances in this relationship. Given that
476 IPV may increase risk of later depression(14), the impact of depressive symptoms on social
477 relationship trajectories could contribute to enduring patterns of depressive symptoms
478 and experience of IPV over the life course.

479

480 In our study, prior depressive symptoms remained associated with IPV even when physical
481 IPV was removed, suggesting that these characteristics could increase risk of IPV through
482 mechanisms involving emotional control, decision-making and negotiation of
483 relationships. On the other hand, the crude association between prior depressive
484 symptoms and physical IPV was small, and attenuated nearly completely on adjustments-
485 this is consistent with one previous prospective study of 79 young American couples
486 suggested that depressive symptoms in women predicted psychological, but not physical
487 partner aggression(56). The reasons for this finding in our study are unclear- aside from a
488 chance effect, it is possible that those who report physical IPV as well as emotional IPV
489 were atypical of the broader population exposed to IPV, resulting in different patterns of
490 associations with depressive symptoms. Depressive symptoms, and suicide attempt, may
491 each act to increase emotional tension and strife in relationships, increasing emotional
492 IPV, but might simultaneously act to reduce physical victimisation by potential
493 perpetrators, as the victim might be considered more vulnerable and unable to defend
494 themselves, or because they spend less time in situations where they might experience
495 victimisation. Differing mechanisms linking depressive symptoms to emotional and
496 physical IPV have not been explored as far as we know. Suicide attempt is common in
497 people diagnosed with depression, personality disorders(57), but also in people in the
498 general population who may not be in contact with mental health services(58). In our
499 study, the item capturing prior suicide attempt item may have been a reflection of
500 impulsivity, depressive symptoms, or use of drugs or alcohol (although we adjusted for

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501 the latter in fully adjusted estimates). The possible impact of suicide attempt on risk of
502 experiencing subsequent victimisation deserves further study. Finally, our third hypothesis
503 for weaker associations between depressive symptoms and workplace victimisation was
504 rejected, and further investigation of the impact of depressive symptoms on workplace
505 victimisation may also be warranted.

506

507 **CONCLUSIONS**

508 Both men and women with prior depressive symptoms, with and without suicide attempt,
509 may be vulnerable to a range of subsequent victimisation types, and may benefit from
510 interventions to reduce this vulnerability. Our findings suggest the specific importance of
511 enquiring about new onset victimisation in people with a history of depressive symptoms,
512 or suicide attempt, rather than only focusing on early life trauma(59). Prospective studies,
513 evaluating type, setting and perpetrators involved in victimisation, are necessary for policy
514 recommendations to be made.

515

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518

519 **DATA AVAILABILITY STATEMENT**

520 Data used in this study is available to download for research from the UK Data Service at:
521 <https://beta.ukdataservice.ac.uk/datacatalogue/studies/study?id=6379>.

522

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526 version of this manuscript.

527

528 **CONFLICTS OF INTEREST**

529 The authors declare no conflicts of interest.

530

531 **SUPPLEMENTARY MATERIAL**

532 For supplementary material accompanying this paper, visit cambridge.org/EPA.

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535 Table 1. Description (in the form of counts and survey-weighted percentages) of prior
 536 depressive symptoms alone, prior depressive symptoms with prior suicide attempt, by
 537 each victimisation type and covariate in the survey sample(n=7403).

	Neither previous depressive symptoms nor suicide attempt		Prior depressive symptoms		Prior depressive symptoms with prior suicide attempt		Row total
	Count	(% ^a)	Count	(% ^a)	Count	(% ^a)	Count(% ^a)
Any recent IPV							
No	4517	(95.5)	2355	(93.2)	157	(83.8)	7029(94.4)
Yes	207	(4.5)	143	(6.8)	24	(16.2)	374(5.6)
Recent emotional IPV							
No	4563	(96.7)	2379	(94.3)	162	(86.6)	7104(95.7)
Yes	161	(3.3)	119	(5.7)	19	(13.4)	299(4.3)
Recent physical IPV							
No	4606	(97.3)	2429	(96.7)	167	(90.7)	7363(97.0)
Yes	118	(2.7)	69	(3.3)	14	(9.3)	40(3.0)
Recent sexual victimisation							
No	4711	(99.7)	2476	(98.6)	176	(96.3)	7376(99.3)
Yes	13	(0.3)	22	(1.4)	5	(3.7)	27(0.7)
Recent workplace victimisation							
No	4716	(99.8)	2480	(99.1)	180	(99.3)	7376(99.5)
Yes	8	(0.2)	18	(0.9)	1	(0.7)	27(0.5)
Any recent victimisation							
No	4499	(95.0)	2329	(91.8)	153	(80.9)	6981(93.6)
Yes	225	(5.0)	169	(8.2)	28	(19.1)	422(6.4)
Greater than two types of recent victimisation							
No	4650	(98.5)	2447	(97.5)	172	(93.6)	7269(98.0)
Yes	74	(1.5)	51	(2.5)	9	(6.4)	134(2.0)
Age(years)							

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16-24	374	(14.8)	175	(12.7)	19	(16.6)	568(14.2)
25-44	1463	(33.6)	907	(39.6)	78	(43.3)	2448(35.9)
45-	2887	(51.6)	1416	(47.7)	84	(40.1)	4387(50.0)
Gender							
Male	2137	(50.1)	1000	(46.4)	60	(37.9)	3197(48.9)
Female	2587	(49.9)	1498	(53.6)	121	(62.1)	4206(51.4)
Educational qualifications							
No qualifications	1618	(28.9)	613	(19.7)	47	(21.7)	2278(25.6)
GCSE	1311	(30.0)	727	(30.2)	65	(39.4)	2103(30.3)
A level	575	(14.5)	341	(15.3)	22	(13.8)	938(14.8)
Degree	1104	(24.3)	771	(33.2)	41	(22.6)	1916(27.2)
Missing	116	(2.3)	46	(1.8)	6	(2.6)	168(2.1)
Childhood abuse							
No	4097	(87.3)	2008	(80.2)	98	(53.8)	6203(84.2)
Yes	627	(12.7)	490	(19.8)	83	(46.2)	1200(15.8)
Hazardous use of alcohol							
No	3738	(76.9)	1923	(74.0)	128	(67.1)	5789(75.7)
Yes	976	(22.9)	574	(25.9)	53	(32.9)	1603(24.1)
Missing	10	(0.2)	1	(0.0)	0	(0.0)	11(0.1)
Lifetime drug use							
Yes	885	(21.6)	665	(31.2)	87	(52.8)	1637(25.6)
No	3802	(77.7)	1826	(68.6)	92	(46.2)	5720(73.9)
Missing	37	(0.7)	7	(0.2)	2	(1.0)	46(0.6)
Lifetime non-violent life events							
No	354	(9.4)	98	(4.9)	5	(2.9)	457(7.8)

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Yes	4370	(90.6)	2400	(95.1)	176	(97.1)	6946(92.2)
Lifetime perpetration of violence							
No	3994	(83.5)	1981	(78.1)	109	(57.6)	6084(81.1)
Yes	690	(15.6)	508	(21.6)	70	(41.4)	1268(18.2)
Missing	40	(0.8)	9	(0.3)	2	(1.0)	51(0.7)
Current depressive episode							
No	4547	(96.9)	2441	(97.8)	160	(90.3)	7148(97.0)
Yes	177	(3.1)	57	(2.2)	21	(9.7)	255(3.0)
Column total	4724	(64.2 ^b)	2498	(33.5 ^b)	181	(23.2 ^b)	7403(100)
a. column percentages b. row percentages							

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Table 2. Association (odds ratios, with 95% confidence intervals) between prior depressive symptoms alone, and prior depressive symptoms with prior suicide attempt (both occurring more than one year ago) and each type of recent victimisation, based on the overall analytic sample, and for men and women. The reference group for all estimates is reporting neither prior depressive symptoms nor prior suicide attempt. All estimates are based on 7068 individuals with complete data on the final modelled variables.

	Unadjusted		Fully adjusted	
	Prior depressive symptoms	Prior depressive symptoms and suicide attempt	Prior depressive symptoms	Prior depressive symptoms and suicide attempt
Recent IPV				
Overall	1.57(1.24, 1.9)	4.41(2.66, 7.33)	1.31(1.01, 1.6)	2.19(1.19, 4.00)
Men	1.92(1.34,2.77)	3.62(1.44,9.12)	1.61(1.09, 2.3)	1.73(0.58, 5.20)
Women	1.32(0.95,1.82)	4.60(2.52,8.41)	1.10(0.78, 1.5)	2.39(1.22, 4.68)
Recent emotional IPV				
Overall	1.75(1.34, 2.2)	4.81(2.72, 8.50)	1.48(1.12, 1.9)	2.44(1.26, 4.75)
Men	2.46(1.61,3.76)	4.38(1.58,12.13)	2.11(1.35, 3.2)	2.16(0.67, 7.04)
Women	1.30(0.90,1.87)	4.69(2.36,9.33)	1.10(0.75, 1.6)	2.48(1.17, 5.25)
Recent physical IPV				
Overall	1.19(0.86, 1.6)	3.92(1.98, 7.76)	0.91(0.64, 1.3)	1.58(0.75, 3.32)
Men	1.27(0.76,2.13)	0.87(0.12,6.55)	0.98(0.56, 1.7)	0.33(0.04, 2.85)
Women	1.12(0.73,1.72)	5.36(2.58,11.10)	0.87(0.59, 1.3)	2.36(1.07, 5.22)
Recent sexual victimisation				
Overall	3.31(1.52, 7.1)	11.99(3.68, 39.0)	2.90(1.37, 6.1)	5.85(1.51, 22.63)
Men	5.69(1.62,19.9)	18.34(2.62, 128.)	4.93(1.52, 15.)	9.12(1.06, 78.36)
Women	2.01(0.68,5.95)	8.79(1.99,38.89)	1.77(0.61, 5.1)	4.09(0.90, 18.69)
Recent workplace victimisation				
Overall	4.13(1.64, 10.)	3.24(0.39, 27.05)	3.33(1.37, 8.1)	2.20(0.27, 17.87)
Men	4.17(1.37, 12.)	-	3.23(1.10, 9.4)	-
Women	4.55(0.95,21.9)	-	3.59(0.75, 17.)	-
Any recent victimisation				
Overall	1.71(1.37,2.14)	4.84(2.99,7.96)	1.43(1.12, 1.8)	2.48(1.38, 4.45)
Men	2.26(1.60,3.18)	5.21(2.35,11.53)	1.91(1.32, 2.7)	2.62(0.98, 7.01)
Women	1.33(0.97,1.82)	4.46(2.44,8.15)	1.10(0.79, 1.5)	2.31(1.17, 4.54)
Cumulative recent victimisation				
Overall	1.71(1.37,2.13)	4.86(2.97, 7.94)	1.47(1.14, 1.8)	2.33(1.22, 4.44)
Men	2.25(1.60,3.16)	4.85(2.31,10.16)	1.89(1.31, 2.7)	2.41(0.95, 6.12)

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Women	1.33(0.97,1.82)	4.68(2.45,8.94)	1.12(0.80, 1.5)	2.57(1.23, 5.38)
<p>Overall models are adjusted for age, gender, educational attainment, childhood abuse, hazardous alcohol use, lifetime drug use, lifetime non-violent adverse life events (in the form of either serious illness/assault to a relative, bereavement, separation, serious interpersonal difficulties, being sacked or made redundant, joblessness/job-searching for longer than one month, or major financial crisis), and lifetime perpetration of violence. Cumulative recent victimisation estimates are from ordinal logistic regression models. Estimates for men and women are from models including a multiplicative interaction term for gender. Likelihood ratio tests indicated statistical evidence for a linear trend in ORs for prior depressive symptoms alone, and prior depressive symptoms with suicide attempt. P-values for superior fit of non-trend model: any IPV: 0.2987, emotional IPV: 0.5776, physical IPV: 0.1156, workplace victimisation: 0.1030, sexual victimisation: 0.9208, any recent victimisation: 0.3703, and cumulative victimisation: 0.3703.</p>				

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Table 3. Association (odds ratios, with 95% confidence intervals) between prior depressive symptoms alone, and prior depressive symptoms with prior suicide attempt, with recent victimisation types, restricted to those without depressive episode at the time of interview, and those without a history of childhood abuse. The reference group for all estimates is reporting neither prior depressive symptoms nor prior suicide attempt.

	Unadjusted		Fully adjusted	
	Prior depressive symptoms only	Prior depressive symptoms and prior suicide attempt	Prior depressive symptoms only	Prior depressive symptoms and prior suicide attempt
Recent IPV				
In those with no childhood abuse ^a	2.02(1.51,2.6)	5.03(2.44,10.37)	1.76(1.30,2.39)	2.90(1.15,7.30)
Without current depressive episode ^b	1.63(1.28,2.0)	4.37(2.52,7.59)	1.34(1.03,1.75)	1.99(1.04,3.82)
Recent emotional IPV				
In those with no childhood abuse ^a	2.39(1.72,3.3)	6.32(2.87,13.95)	2.14(1.52,3.02)	3.83(1.47,9.94)
Without current depressive episode ^b	1.83(1.39,2.4)	4.80(2.58,8.95)	1.54(1.15,2.08)	2.27(1.11,4.62)
Recent physical IPV				
In those with no childhood abuse ^a	1.41(0.94,2.1)	2.03(0.65,6.31)	1.13(0.74,1.74)	0.89(0.25,3.16)
Without current depressive episode ^b	1.27(0.90,1.7)	3.85(1.81,8.18)	0.95(0.66,1.37)	1.37(0.61,3.07)
Recent sexual victimisation				
In those with no childhood trauma ^a	3.89(1.21,12.1)	21.20(3.33,135.6)	3.81(1.15,12.67)	20.68(2.71,157.83)
Without current depressive episode ^b	3.82(1.63,8.9)	12.61(3.21,49.5)	3.32(1.47,7.51)	5.32(1.09,25.93)
Recent workplace victimisation				
In those with no childhood abuse ^a	2.88(1.01,8.1)	-	2.59(0.92,7.35)	-
Without current depressive episode ^b	3.84(1.51,9.7)	3.49(0.42,29.18)	3.01(1.22,7.38)	2.25(0.28,18.31)
Any recent victimisation				
In those with no childhood abuse ^a	2.08(1.58,2.7)	5.46(2.73,10.94)	1.84(1.37,2.47)	3.43(1.41,8.35)

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Without current depressive episode ^b	1.76(1.40,2.2)	4.80(2.84,8.13)	1.46(1.13, 1.88)	2.28(1.21, 4.29)
Cumulative recent victimisation				
In those with no childhood abuse ^a	2.08(1.58,2.7)	5.30(2.71,10.36)	1.85(1.38, 2.48)	3.37(1.40, 8.11)
Without current depressive episode ^b	1.76(1.40,2.2)	4.81(2.81,8.21)	1.47(1.14, 1.89)	2.33(1.22, 4.44)
a. based on 5911 participants b. based on 6829 participants				

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