1   **Intimate Partner Violence and Health-Related Quality of Life in European men and**

2   **women: findings from the DOVE study**

3   Diogo Costa*[1], Eleni Hatzidimitriadou[2], Elli Ioannidi-Kapolou[3], Jutta Lindert[4], Joaquim Soares[5],

4   Örjan Sundin[6], Olga Toth[7], Henrique Barros[1, 8].

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6   [1]Institute of Public Health, University of Porto, Porto, Portugal.

7   [2]Faculty of Health and Social Care Sciences, Kingston University and St George's, University of London,

8   London, United Kingdom.

9   [3]Department of Sociology, National School of Public Health, Athens, Greece

10   [4]University of Emden, Emden, Germany and Brandeis University, Waltham, United States of America.

11   [5]Institution for Health Sciences, Mid Sweden University, Sundsvall, Sweden.

12   [6]Department of Psychology, Mid Sweden University, Östersund, Sweden.

13   [7]Institute of Sociology, Hungarian Academy of Sciences, Budapest, Hungary.

14   [8]Department of Clinical Epidemiology, Predictive Medicine and Public Health, University of Porto

15   Medical School, Porto, Portugal.

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17   *Corresponding author:

18   Diogo Costa

19   Institute of Public Health, University of Porto

20   Rua das Taipas, 135

21   4050-600 Porto, Portugal

22   Phone: +351 22 551 36 52

23   Fax: +351 22 551 36 53

24   Email: dmcosta@med.up.pt

25

30   **Abstract**

31   **Purpose:** Little is known on the specific relation between being a perpetrator or both a victim

32   and perpetrator of intimate partner violence (IPV) and health-related quality of life (HRQoL). .

33   We assessed the association between HRQoL and abuse considering men and women

34   experiencing as victims, perpetrators or reciprocally.

35   **Methods:** Participants were adult men and women (n=3496), randomly selected from the

36   general population of six European cities. The Revised-Conflict-Tactics-Scales and the

37   Medical-Outcomes-Study 36-item Short-Form Health Survey (SF-36) were used to measure

38   IPV and HRQoL. The age-, education- and city-adjusted mean scores[standard error] of the

39   physical and of the mental SF-36 component summarieswere used to compare victims-only,

40   perpetrators-only, and those involved in both (bidirectional or reciprocal cases) with those not

41   involved in past-year and lifetime physical assault and/or sexual coercion.

42   **Results:** The physical component summary was significantly lower in women involved in in past

43   year bidirectional physical assault compared to non-abused women. The mental component

44   summary in women not involved in IPV was significantly higher than in those physically abused,

45   regardless of type of involvement. Women victims-only of past year sexual coercion and victims

46   or involved in bidirectional concomitant physical and sexual IPV also presented lower scores in

47   the mental component summary than women not involved in IPV . In men, significantly lower

48   scores in the mental component summary were found in the past year bidirectional physically

49   assaulted group and among those involved bidirectionally in both physical and sexual IPV

50   compared to men not involved in IPV.

51   **Conclusion:** Experiencing physical and sexual IPV is negatively associated with HRQoL. Lower

52   scores in the mental component summary of the SF-36 are evident among female victims and

53   among males and females involved in intimate partner violence as both victims and perpetrators

54   when compared to females and males not involved in violence.

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Introduction

Quality-of-life is an important outcome measure in routine clinical practice and in research

[1].More specifically, health-related quality-of-life (HRQoL) involve perceptions of wellbeing

and functioning in physical, mental, social and daily life activities that comprise a summary

quantification of perceived health [2]. Health-related quality of life is a quantitative summary

measure of the effect of a condition on individual's lives and it provides an estimate of the

potential benefit of interventions. Health-related quality of lifeis useful in decision making on

prioritization of resources across competing programs and interventions [3].

Intimate partner violence (IPV) is a human rights violation. It is a major public health problem

[4],defined as any physical, sexual or psychological harm inflicted by a current or former

partner. Worldwide, more than 30% of women are victims of IPV[5]. Less is known about

male victimization but the published data, mainly from English speaking populations, pointed to

a 25% prevalence [6].

Short and long-term adverse physical and mental health consequences of IPV [4; 7], including a

decreased HRQoL [8; 9], have often been reported, but focused only in victims [9-11].

However, reciprocal or bidirectional violence, defined as involvement as both a victim and

perpetrator, is thought to be the most commonly identified profile of IPV when dealing with

general population samples [12], although previous studies looking at bidirectional IPV mainly

dealt with university student samples or adolescent samples from the US [13; 14]. Studies

performed with clinical samples suggested that bidirectional IPV is more strongly associated

with adverse health outcomes than unidirectional violence [15; 16]. Exploring the experiences

of victims and perpetrators, might also elucidate different sex-patterns of associations, as shown

in a large Canadian cross-sectional telephone survey, where depressive symptoms were more

often reported by female victims and male perpetrators [17].

The association between HRQoL and the type of involvement in IPV remains poorly described

and to the best of our knowledge, it was never assessed using a multiple country sample. With

the present investigation we explored in a general population sample of men and women living

85   in six European cities how experiencing abuse as victims, perpetrators or reciprocally is

86   associated with HRQoL.

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89   **Methods**

90   *Participants*

91   We used data collected as part of the DOVE project, (http://doveproject.eu), a European

92   multinational research project designed to evaluate the frequency of IPV and health-related

93   associated factors. In the present study, participants were non-institutionalized adult men and

94   women (aged 18-65), national citizens or documented migrants, sampled from the general

95   population of six cities (Athens – Greece, Budapest – Hungary, London – United Kingdom,

96   Östersund – Sweden, Porto - Portugal and Stuttgart – Germany) although two other cities

97   (Ghent, Granada) were initially thought but could not reach the targeted sample size [18].

98   Random sample lists were obtained through city's municipality registries in Stuttgart, through

99   the electoral registry in Porto and London, and through the state person address registry in

100 Östersund. Additional sampling strategies included random-digit dialling in Porto and a via-

101 public approach in London. Random route was used in Athens and Budapest. We previously

102 described and discussed the design, methods, procedures and characteristics of the samples in

103 comparison to the resident population [18]. The final sample comprised 3496 participants, 1470

104 men and 2026 women..

105 A questionnaire was developed, comprising information on socio-demographic characteristics,

106 intimate relationships, physical and mental health. In all cities the IPV section was self-

107 administered and, except for Östersund, face-to-face interviews were conducted for the

108 remaining topics. In Östersund, the local ethics committee required all questionnaires to be

109 mailed with a pre-paid envelope for return. In Porto, London and Stuttgart if participants were

110 otherwise unreachable or explicitly asked for it, questionnaires were also mailed to their homes

111 following the same procedure. The World Health Organization (WHO) ethical and safety

112 guidelines for the conduct of research on violence against women were followed [19]. In the

113   case of posted questionnaires, a letter was sent detailing the study objective, the participant's

114   selection procedures and explaining the anonymous character of responses. It also included the

115   full names and contacts of the research team (telephone, e-mail), institution, funding agency and

116   project website. The study protocol was approved by a Research Ethic Committee in each

117   center. Data collection lasted approximately 9 months and ended in May 2011.

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119   *Outcome measure*

120   The outcome measure was the physical and mental component summaries derived from the

121   eight domains of the Medical Outcomes Study 36-item Short-Form Health Survey (SF-36) [20].

122   The SF-36 as a measure of health-related quality of life refers to functional health and well-

123   being in the previous 4-weeks and has been widely tested and used in several countries, namely

124   in all the countries represented in this study [21-26].

125   The physical and mental component summaries of SF-36 were computed following

126   recommendation for their use in multinational comparisons [27]: all eight domains of the SF-36

127   (physical functioning, physical role functioning, bodily pain, general health, vitality, social

128   functioning, emotional role functioning, and mental health) were standardized using a linear z-

129   score transformation obtained by subtracting domain means for the general US population from

130   each domain score in our sample and dividing the difference by the standard deviation of the US

131   population; these z-scores were then multiplied by the component factor score coefficient for

132   physical and mental health summaries as obtained from the factorial analysis extracted for the

133   US population and summed over the eight domains; the resulting physical and mental summary

134   scales sums were then t-scored (multiplied by 10 and added 50). The higher the scores, the

135   better expected HRQoL.

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138   *Exposure measure*

139   The physical assault and sexual coercion subscales of the Revised Conflict Tactics Scales

140   (CTS2) were used to define exposure to physical and/or sexual IPV [28]. The CTS2 was

141 originally developed in English and has been used in more than 100 studies, including in

142 multinational comparisons. It was previously validated to Portuguese, German and Swedish

143 populations [29; 30]. Translations to Greek and Hungarian followed a standard protocol:

144 forward translation, expert panel revision, back-translation, new expert panel revision and

145 piloting. The internal consistency of the CTS2 (Cronbach alpha) in our sample, was 0.903 for

146 victimization (ranging from 0.825 in Budapest to 0.956 in London) and 0.896 for perpetration

147 (ranging from 0.748 in Östersund to 0.953 in London), in line with previous reliability analysis

148 [30].

149 The CTS2 physical assault and sexual coercion subscales comprise, respectively, 12 and 7

150 specific acts or behaviours.It include minor acts (examples: "I threw something at my partner

151 that could hurt", "I made my partner have sex without a condom") and severe acts (examples: "I

152 used a knife or a gun on my partner", "I used force (like hitting, holding down, or using a

153 weapon to make my partner have oral or anal sex"). For each act, participants are asked whether

154 they have been victims or perpetrators and they are given an 8 options scale to mark if it

155 happened: never, once in the past year, twice, 3–5 times, 6–10 times, 11–20 times, more than 20

156 times or ever but not in the past year. When all items describing each type of violence were

157 answered as "never", the participant was coded as a never victim or never perpetrator. To

158 overcome the skewed time frequency response distribution, participants were recoded as

159 victims-only, perpetrators-only or as involved in bidirectional violence.

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162 *Sociodemographic factors*

163 Age was classified in 5 years groups: 18-24, 25-34, 35-44, 45-54, 55-64, and educational level

164 in three: primary level, secondary level, university degree, according to completed stage of

165 schooling.

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167 *Statistical analysis*

168   T-test and ANOVAs were used to compare mean scores (standard deviation) of the physical and

169   mental component summaries of SF-36 according to sex, age groups, educational level and city

170   of residence. Chi-square test was used to compare the proportions.

171   The mean (standard errors) of the physical and mental component summaries of the SF-36 by

172   type of involvement in violence were computed by fitting linear regression models. Models

173   were adjusted for age, education and city of residence and computed for physical assault, sexual

174   coercion and for concomitant physical assault and sexual coercion. We considered separately

175   the experiences of past year IPV and of having ever experienced IPV. We tested the interaction

176   of sex and IPV by including the interaction term for each violence type. As there was a

177   statistically significant interaction we stratified the analysis by sex.

178   We then performed a pairwise comparison of each estimated mean with the group declaring "no

179   violence" using a Bonferroni correction.

180   From the 3496 participants, there was missing information for physical assault in 182 (5.2%),

181   for sexual coercion in 183 (5.2%) and 2 (0.1%) did not provided the SF-36 evaluation. Only

182   participants with complete information were used in the regression models no imputation being

183   made for missing data.

184   An additional analysis was performed considering a measure of chronicity of abusive acts and is

185   provided as supplementary material. Among participants who engaged in one or more acts of

186   violence in the previous year, we added the midpoints for the frequency categories chosen and

187   summed these acts for each type of violence. The midpoints considered were accordingly: one,

188   two, four, eight, 15 and 25, as suggested by the original scale' author [31]. The mean number

189   (standard deviation) of violent acts were computed according to violence involvement and

190   severity subscales. T-test was used to compare the mean number of minor and severe acts by

191   sex. Correlations between the number of acts and the physical and mental component

192   summaries of the SF-36 were also estimated separately for minor and severe acts of violence

193   among participants reporting victimization, perpetration and bidirectional involvement.. The

194   analyses were conducted using SPSS v20.

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199   **Results**

200   In general, mean SF-36 physical and mental component summaries were higher in men than

201   women (Table 1) and increased with the educational level in both sexes. The physical

202   component summary mean score also significantly decreased with age in both sexes.

203   Statistically significant differences were found according to city of residence: the lowest mean

204   scores for the physical component summary were observed in Porto for women (48.20 [7.69])

205   and in London for men (50.86 [9.36]) while the highest were observed in Stuttgart for women

206   (51.93 [8.48]) and in Budapest for men (53.68 [7.51]); for the mental component summary, the

207   lowest mean was observed in Porto for women (46.27 [11.39]) and in Athens for men (49.17

208   [8.62]) while the highest were observed in Budapest for women (50.09 [10.37]) and in

209   Östersund for men (52.18 [8.99]).

210

211   Table 1 about here

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213   As shown in Table 2, the past year prevalence of victimization only, perpetration only and

214   bidirectional physical assault in women was 3.5%, 4.2% and 10.0% respectively, while the

215   corresponding figures for men were 4.1%, 3.8% and 11.9%, with no sex differences. For sexual

216   coercion, 7.7% of women and 3.0% of men declared to be only victims, 1.6% of women and

217   7.5% of men declared only perpetration and 9.7% of women and 12.5% of men declared

218   bidirectional involvement (p<0.05). The observed frequency of concomitant involvement in

219   physical assault and sexual coercion was 1.2% in women and 0.5% in men for victimization

220   only, 0.2% in women and 0.8% in men for perpetration only and 4.0% in women and 5.1% in

221   men for bidirectional involvement (p<0.05).

222

223   Table 2 about here

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225 After adjustment for age, education and city of residence, women involved in bidirectional

226 physical assault presented a significantly lower physical component summary mean score

227 (48.00 [0.58]) than those declaring no physical assault (49.75 [0.26]). No other significant

228 difference was observed regarding the physical component summary.

229 A statistically significant lower mean score in the mental component summary of the SF-36 was

230 found in the group of women involved in physical assault as victims and also in the group

231 involved in bidirectional physical assault and in the group reporting perpetration of physical

232 assault, compared to women reporting no past year physical assault.. The scores were also

233 significantly lower among women only victims of sexual coercion compared to those who did

234 not report past year sexual coercion. Women who were victims only and who were involved in

235 bidirectional physical and sexual IPV also presented lower mental component summary mean

236 scores than those reporting no-violence. In men, significant lower mental component summary

237 scores were observed among those involved in bidirectional physical assault, and in

238 bidirectional concomitant physical assault and sexual coercion, compared to those not involved

239 in IPV.

240 Table 3 shows the results for ever experiencing physical assault and sexual coercion. In women,

241 5.6% reported having ever been victims or perpetrators of physical assault and 15.9% reported

242 ever being involved in bidirectional physical assault. In men these proportions were 5.4%

243 victims, 5.4% perpetrators and 18.4% for bidirectional involvement. Lifetime victimization-only

244 of sexual coercion was declared by 11.3% of women and 3.5% of men, bidirectional sexual

245 coercion was 13.9% in women and 18.9% in men and the prevalence of having ever perpetrated

246 sexual coercion was 1.7% in women and 8.9% in men (p<0.05). Victims-only of both physical

247 assault and sexual coercion were 2.8% in women and 0.8% in men, perpetrators only were 0.2%

248 in women and 1.7% in men and bidirectional involvement was 7.5% in women and 11.4% in

249 men (p<0.05).

250

251 Table 3 about here

252

253   In the models adjusted for age, education and city of residence, we observed a lower mean score

254   in the physical component summary of the SF-36 among women involved in violence

255   bidirectionally. The difference was statistically significant when compared to women who

256   declared no lifetime experience of the two types of violence considered. For the mental

257   component summary, mean scores were lower for those involved in violence compared to those

258   who never experienced it. Statistically significant differences when compared to those never

259   involved in IPV were observed for women involved in physical assault (victims, perpetrators

260   and bidirectionally), women victims-only of sexual coercion, women victims and involved in

261   bidirectional concomitant physical assault and sexual coercion, and for men involved in

262   bidirectional physical assault, bidirectional sexual coercion and accumulating the latter two

263   experiences.

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265

266   **Discussion**

267   We found that HRQoL is associated with physical and sexual abuse and that it varied with sex

268   and role in the victim/perpetrator process, being especially evident for the mental component

269   summary of the SF-36. In models adjusted for age, education and residence, women victims-

270   only of lifetime or past year physical assault and sexual coercion presented lower scores in the

271   mental component summary of the SF-36 compared to women not experiencing violence, which

272   was not observed among men victims-only. Declared past year and lifetime victimization and

273   perpetration of physical assault and of physical assault and sexual coercion cumulatively, was

274   associated with a decreased mental component summary in both men and women. Female

275   perpetrators-only of physical assault presented a lower mental component summary, compared

276   to those not involved in any type of violence for both lifetime and past year periods.

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278   The results found in the present study and concerning victims are in line with the findings in a

279   Norwegian sample of battered women, assessed in shelters, that showed a marked decrease in

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280 the mental health domains of the SF-36 [11]. Similarly, results from two Danish nationally

281 representative, cross-sectional health interview surveys, revealed that victims of physical

282 violence scored lower in HRQoL, and the effect was more pronounced in women than in men

283 [10]. In our study, the accumulation of physical assault and sexual coercion in women victims

284 represented a decrease in the mental component summary, as in a previous Australian study of

285 the general population of women, for whom cumulative types of gender-based violence

286 represented impaired quality of life [8]. Women victims of IPV present increased levels of

287 depressive symptoms [32] and somatic complaints [33], have lower social support [34], all of

288 which directly affect their health perception. Furthermore, physical assaults may directly

289 increase the risk of injuries or predispose and aggravate some chronic diseases [35]. Although

290 the severity of abuse impacts directly the physical health perception of a victim, the

291 psychological stress associated with less severe types of IPV may also affect other acute or

292 chronic health conditions through more indirect paths [36]. Etiologic studies are only in their

293 beginnings, but the emotional suffering derived from any type of abuse, is likely to affect the

294 immune system as it responds to prolonged stress [37].

295 We also observed lower scores in the mental component summary of the SF-36 for men and

296 women involved in bidirectional physical assault and in bidirectional concomitant physical

297 assault and sexual coercion. This is in line with studies documenting that bidirectional violence

298 might entail more severe acts [12; 38] and is associated with depressive symptoms [39], thus

299 affecting the health perception of both men and women, particularly the domains linked to their

300 mental health.

301 A significantly lower score in the physical component summary was only noted in women

302 involved in bidirectional violence in the previous year and for the lifetime period compared to

303 those not involved in IPV, which supports previous accounts of more deleterious health effects

304 of IPV in women than in men [10] as a result of the physical conflict. It has been suggested that

305 women suffer more violence victimization than men during their lifetime [40], and report more

306 severe acts [41; 42]. An analysis of the chronicity of minor and severe acts of IPV in our sample

307 (Supplementary Table 1) showed that women involved in past year IPV reported more minor

308   bidirectional physical assault acts and suffered more minor sexual coercion acts compared to

309   men. No statistically significant sex-difference was observed for the mean number of severe

310   abusive acts and the chronicity of IPV presents, essentially, negative correlations with the

311   physical and mental component summaries of the SF-36.

312   In women, perpetration-only of physical assault was also represented by a lower score in the

313   mental component summary. Although the debate over the motivations of women's perpetration

314   is still unresolved [43], previous studies linking depression with IPV perpetration in women

315   suggest that feelings of guilt, shame or regret might explain why women who perpetrate feel

316   more depressed than non-perpetrators [17]. It has been suggested that depressive symptoms

317   experienced by women who perpetrate are the result of a reaction to an event perceived as

318   unusual to them, since their usual role is one of nurturing [44]. Thus, the same mechanism

319   might explain the results found for the mental component summary of the SF-36, which

320   includes domains linked to the individual's social functioning and emotional well-being,

321   important characteristics of a depressive state.

322   Less is known of the impact of sexual coercion acts in HRQoL. It must be acknowledged that

323   various types of violence generally coexist in the same violent intimate relationship [4; 45; 46],

324   which increases the difficulty of disentangling the particular impact of each type of violence in

325   HRQoL domains, should they prove to affect these domains differently. In women victims of

326   past year sexual coercion we found a significantly lower score in the mental component

327   summary, which is in line with a previous Italian study documenting the impact of sexual IPV

328   victimization to be greater for female student victims (compared to male), with higher odds for

329   panic attacks, alcohol use, eating problems and suicide ideation [47]. It has been suggested that

330   sexual coercion against men is qualitatively different, less severe, and that men are more likely

331   to accept force in their sexual relationships, while women find it unacceptable more often [48].

332   The fact that no significant difference in the physical and mental component summaries of men

333   was found for past year IPV may also be due to a social desirability bias, with men tending to

334   demonstrate a tougher posture [47]. A 1988 study performed in college students already

335   reported that among 22 men victims of sexual coercion, 25% felt "good" about being forced to

336 have sex, 50% felt "neutral" and 25% felt "bad", whereas none of the 32 women victims

337 assessed felt "good" and 88% felt "bad or very bad" after a sex incident [49]. Men victims of

338 sexual coercion may perceive their situation as positive, thus not feeling harmed or violated, but

339 rather see it as an opportunity for sexual intimacy, which would result in better health

340 perceptions. Nevertheless, the effects of male sexual coercion victimization should be the focus

341 of further explorations [50].

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343 The main strengths of this study include the large sample size, the geographical diversity and

344 the measurement of both the exposure and outcome with two reliable and commonly used

345 instruments: the CTS2 [28] and the SF-36 [2; 20]. However, the cross-sectional nature of our

346 study does not allow inferences on causality. As in all studies assessing sensitive topics, the

347 potential bias imposed by social desirability is a limitation [51]. Our samples were drawn from

348 the general population of adults living in urban centres, but we used different sampling

349 procedures which might have led to selection bias. However, the age distribution of the study

350 samples was close to the resident population in Athens, London and Stuttgart, but in Budapest,

351 Östersund and Porto, participants were older, and the educational level in all cities was

352 generally higher than the resident population which might translate into underestimation of

353 violence [18]. It was not possible to collect information on non-responses in all cities. However,

354 registry-based sampling (municipal or electoral) and random route, are expected to provide

355 acceptable coverage of the target population, and to represent it. The past experience of the

356 research consortium determined the choice for the particular cities assessed based on the region

357 where institutions were established. Nevertheless, the involved diversity was since the

358 beginning considered an advantage to implicitly guarantee the representation of multiple

359 cultural and social experiences even if not specifically addressed.

360 Despite the differences observed in these European urban centers regarding IPV campaigns,

361 gender equality initiatives, laws, action plans and support mechanisms, all expected to influence

362 prevalence rates and attitudes towards disclosure, our results suggest that the relation between

363 IPV and HRQoL may be independent from several of these societal-level factors. Nevertheless,

364 the need remains for contextualized assessments (and of further cross-regional comparisons) to

365 inform city-specific preventive strategies.

366 Although IPV experience was disclosed using self-administered questionnaires, it is plausible to

367 think that victims of severe violence might reject participation or answer in a more socially

368 acceptable way, especially regarding males from more "patriarchal" societies [52]. Also, using

369 individual data (compared to couple) to assess IPV may lead to underreporting, both in men and

370 women, but even more in men for physical assault [53], although support for underreporting was

371 not found in posterior results obtained in representative sample of USA adolescents [12].

372 However, the assessment of couples may increase the risk of violence, thus relying in individual

373 data is a safer option.

374 For clarity and because they are the most commonly measured types of violence, we only

375 analyzed physical assault and sexual coercion reports. Further analysis should also consider the

376 other violence types (e.g. psychological, injury).

377 In summary, the results of this study provide empirical evidence for an association between IPV

378 and the HRQoL and that the influence of violence in HRQoL depends on the type of

379 involvement in violence. Lower scores were consistently observed in the mental component

380 summary of the SF-36 in female victims of physical assault or sexual coercion. However,

381 women and men reporting bidirectional violence also presented lower scores in the mental

382 component summary of the SF-36 which calls for a particular focus on the bidirectional nature

383 of IPV when intervention strategies are designed.

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Conflicts of interest

None declared.

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Ethical standards

The manuscript does not contain clinical studies or patient data.

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Tables

Table 1. Sample characteristics and mean scores for the SF-36 physical and mental component summaries according to socio-demographics.

				Physical Health		Mental Health	
		Women n (%)	Men n (%)	Women mean (SD)	Men mean (SD)	Women mean (SD)	Men mean (SD)
Age	**18-24**	253 (12.5)	181 (12.3)	54.15 (5.61)	56.14 (5.39)	48.07 (10.71)	51.93 (8.15)
	25-34	396 (19.5)	315 (21.4)	53.43 (6.60)	54.33 (6.65)	47.66 (9.77)	50.22 (9.53)
	35-44	436 (21.5)	341 (23.2)	51.66 (7.77)	54.11 (5.65)	49.10 (9.35)	49.88 (8.63)
	45-54	433 (21.4)	314 (21.4)	49.82 (8.07)	50.78 (8.21)	47.48 (10.63)	49.29 (10.20)
	55-64	508 (25.1)	319 (21.7)	46.55 (9.99)	48.51 (7.63)	49.37 (10.61)	51.52 (8.95)
	p*			<0.001	<0.001	0.014	0.004
Education	**Primary**	171 (8.7)	86 (6.0)	44.24 (10.15)	48.53 (9.61)	46.44 (12.20)	48.66 (11.50)
	Secondary	933 (47.3)	749 (52.5)	50.39 (8.64)	52.03 (8.12)	47.90 (10.73)	49.89 (9.51)
	University	869 (44.0)	593 (41.5)	52.22 (7.17)	53.68 (6.26)	49.33 (9.17)	51.39 (8.36)
	p*			<0.001	<0.001	<0.001	0.002
City	**Athens**	276 (13.6)	272 (18.5)	51.05 (7.54)	53.48 (7.26)	48.99 (9.71)	49.17 (8.62)
	Budapest	356 (17.6)	248 (16.9)	50.72 (9.75)	53.68 (7.51)	50.09 (10.37)	51.97 (8.94)
	London	298 (14.7)	273 (18.6)	51.72 (8.19)	50.86 (9.36)	46.72 (10.14)	49.27 (9.50)
	Östersund	370 (18.3)	222 (15.1)	50.97 (9.20)	52.45 (7.29)	49.32 (9.88)	52.18 (8.99)
	Porto	408 (20.1)	227 (15.4)	48.20 (7.69)	51.35 (6.12)	46.27 (11.39)	49.59 (10.32)
	Stuttgart	318 (15.7)	228 (15.5)	51.93 (8.48)	53.08 (7.16)	49.31 (8.72)	50.81 (8.54)
	p*			<0.001	<0.001	<0.001	<0.001
Total				50.64 (8.48)	52.48 (7.63)	48.41 (10.23)	50.44 (9.23)
	p†			<0.001		<0.001	

*p-value ANOVA comparing mean scores of the SF-36 component summaries;
†p-value for T-test comparing mean scores of the SF-36 component summaries in women vs. men;
SD=standard deviation.

Table 2. Adjusted mean scores for the SF-36 physical and mental component summaries, in women and men according to directionality of involvement in past year physical

assault and sexual coercion as types of intimate partner violence.

				Physical Health		Mental Health	
		Women	Men	Women	Men	Women	Men
		n (%)	n (%)	Adjusted Mean (SE)†	Adjusted Mean (SE)†	Adjusted Mean (SE)†	Adjusted Mean (SE)†
Physical Assault	**No**	1592 (82.4)	1108 (80.2)	49.75 (0.26)	51.96 (0.30)	49.09 (0.34)	50.25 (0.40)
	Victim	67 (3.5)	56 (4.1)	49.09 (0.99)	52.15 (0.96)	42.05 (1.26)*	49.31 (1.27)
	Bidirectional	193 (10.0)	165 (11.9)	48.00 (0.58)*	50.48 (0.59)	42.86 (0.73)*	46.34 (0.78)*
	Perpetrator	81 (4.2)	52 (3.8)	48.76 (0.88)	51.96 (0.98)	45.46 (1.11)*	50.07 (1.30)
Sexual Coercion‡	**No**	1566 (81.0)	1063 (77.0)	49.64 (0.26)	51.71 (0.30)	48.26 (0.34)	50.04 (0.40)
	Victim	149 (7.7)	41 (3.0)	49.27 (0.67)	53.81 (1.10)	44.74 (0.86)*	48.94 (1.47)
	Bidirectional	187 (9.7)	173 (12.5)	48.01 (0.61)	51.70 (0.58)	46.85 (0.79)	48.14 (0.77)
	Perpetrator	31 (1.6)	103 (7.5)	49.92 (1.44)	52.03 (0.71)	48.30 (1.87)	49.09 (0.95)
Physical Assault and Sexual Coercion‡	**No**	1371 (94.6)	916 (93.6)	49.46 (0.29)	51.41 (0.34)	49.11 (0.36)	50.62 (0.43)
	Victim	18 (1.2)	5 (0.5)	49.86 (1.90)	53.89 (3.12)	41.43 (2.36)*	45.97 (3.95)
	Bidirectional	58 (4.0)	50 (5.1)	47.21 (1.04)	49.31 (1.03)	43.34 (1.30)*	46.17 (1.30)*
	Perpetrator	3 (0.2)	8 (0.8)	39.57 (4.49)	54.29 (2.47)	48.42 (5.59)	51.98 (3.12)

*p<0.05 for comparison with the "no-violence" group (Bonferroni correction was used in pairwise comparison);
‡p<0.05 for chi-square test comparing the prevalence of violence by sex;
† adjusted for age, education and city of residence; SE=standard error.

Table 3. Adjusted mean scores for the SF-36 physical and mental component summaries, in women and men according to directionality of involvement in lifetime physical assault and sexual coercion as types of intimate partner violence.

| | | | | Physical Health | | Mental Health | |
| | | Women | Men | Women | Men | Women | Men |
		n (%)	n (%)	Adjusted Mean (SE)†	Adjusted Mean (SE)†	Adjusted Mean (SE)†	Adjusted Mean (SE)†
Lifetime Physical Assault	**No**	1407 (72.8)	978 (70.8)	49.83 (0.28)	51.99 (0.31)	49.54 (0.35)	50.62 (0.41)
	Victim	109 (5.6)	75 (5.4)	49.79 (0.77)	52.47 (0.84)	44.82 (0.98)*	49.85 (1.11)
	Bidirectional	308 (15.9)	254 (18.4)	48.03 (0.47)*	51.14 (0.49)	43.05 (0.59)*	46.56 (0.65)*
	Perpetrator	109 (5.6)	74 (5.4)	49.30 (0.76)	50.91 (0.83)	46.92 (0.96)*	48.65 (1.09)
Lifetime Sexual Coercion‡	**No**	1415 (73.2)	948 (68.7)	49.74 (0.27)	51.83 (0.31)	48.49 (0.35)	50.40 (0.42)
	Victim	218 (11.3)	48 (3.5)	49.54 (0.56)	53.59 (1.03)	45.03 (0.73)*	48.71 (1.37)
	Bidirectional	268 (13.9)	261 (18.9)	48.01 (0.51)*	51.20 (0.50)	46.65 (0.66)	47.84 (0.66)*
	Perpetrator	32 (1.7)	123 (8.9)	49.45 (1.41)	51.92 (0.65)	48.26 (1.83)	48.77 (0.86)
Lifetime Physical Assault and Sexual Coercion‡	**No**	1137 (89.5)	752 (86.0)	49.70 (0.32)	51.60 (0.37)	49.73 (0.40)	50.90 (0.46)
	Victim	36 (2.8)	7 (0.8)	50.51 (1.32)	53.18 (2.80)	44.69 (1.66)*	46.12 (3.51)
	Bidirectional	95 (7.5)	100 (11.4)	46.71 (0.82)*	50.05 (0.76)	43.06 (1.03)*	46.35 (0.96)*
	Perpetrator	3 (0.2)	15 (1.7)	39.71 (4.46)	50.53 (1.78)	48.20 (5.59)	48.79 (2.24)

*p<0.05 for comparison with the "no-violence" group (Bonferroni correction was used in pairwise comparison);
‡p<0.05 for chi-square test comparing the prevalence of violence by sex;
† adjusted for age, education and city of residence; SE=standard error.