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Domestic violence and self-poisoning in Sri Lanka

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Abstract

Background. There is increasing evidence that domestic violence (DV) is an important risk factor for suicidal behaviour. The level of risk and its contribution to the overall burden of suicidal behaviour among men and women has not been quantified in South Asia. We carried out a large case-control study to examine the association between DV and self-poisoning in Sri Lanka.

Methods. Cases ($N = 291$) were patients aged ⩾18 years, admitted to a tertiary hospital in Kandy Sri Lanka for self-poisoning. Sex and age frequency matched controls were recruited from the hospital's outpatient department ($N = 490$) and local population ($N = 450$). Exposure to DV was collected through the Humiliation, Afraid, Rape, Kick questionnaire. Multivariable logistic regression models were conducted to estimate the association between DV and self-poisoning, and population attributable fractions were calculated.

Results. Exposure to at least one type of DV within the previous 12 months was strongly associated with self-poisoning for women [adjusted OR (AOR) 4.08, 95% CI 1.60–4.78] and men (AOR 2.52, 95% CI 1.51–4.21), compared to those reporting no abuse. Among women, the association was strongest for physical violence (AOR 14.07, 95% CI 5.87–33.72), whereas among men, emotional abuse showed the highest risk (AOR 2.75, 95% CI 1.57–4.82). PAF % for exposure to at least one type of DV was 38% (95% CI 32–43) in women and 22% (95% CI 14–29) in men.

Conclusions. Multi-sectoral interventions to address DV including enhanced identification in health care settings, community-based strategies, and integration of DV support and psychological services may substantially reduce suicidal behaviour in Sri Lanka.

Introduction

Globally, approximately three-quarters of all suicide deaths annually occur in low- and middle-income countries (LMIC) (WHO, 2014). Sri Lanka, a middle-income country has made significant progress in reducing its overall suicide rate (Knipe, Gunnell, & Eddleston, 2017), however, suicide remains a key cause of premature mortality and rates of medicinal self-poisoning have increased in recent years, particularly among young women (de Silva, Senanayake, Dias, & Hanwella, 2012; Knipe et al., 2017; Rajapakse, Griffiths, & Christensen, 2013; Senarathna et al., 2012). Understanding the risk factors for suicidal behaviour is crucial in informing prevention efforts. Psychiatric disorders are important determinants of suicidal behaviour, however evidence of this association in LMIC is less clear, highlighting the need for a wider, non-medical approach (Knipe et al., 2019c). In Sri Lanka, qualitative and case-series studies have consistently reported conflict and verbal disputes with an intimate partner or family member as the most common precipitating factor associated with suicidal behaviour (Konradsen, van der Hoek, & Peiris, 2006; Rajapakse et al., 2013). This is consistent with findings from Pakistan and India where interpersonal conflict, including family arguments and relationship breakdowns, have been identified as an acute trigger in up to 68% of self-harm cases (Parkar, Dawani, & Weiss, 2006; Syed & Khan, 2008).

A systematic review of 37 studies (31 of which originated from high-income countries) showed strong associations between intimate partner violence (IPV) and suicidal behaviour (McLaughlin, O'carroll, & O'connor, 2012). The WHO multi-country study using population-based surveys from mostly LMIC showed that women exposed to physical or sexual violence were 3.8 times more likely to attempt suicide than non-abused women (Devries et al., 2011). Evidence from studies conducted in Afghanistan (Paiman, Khan, Ali, Asad, & Azam, 2019)

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and India (Chowdhary & Patel, 2008) likewise demonstrated strong associations between lifetime exposure to domestic violence (DV) and self-harm (OR 6.4 and 7.2, respectively).

The burden of DV appears to be higher in LMIC, particularly in South Asia where 42% of ever-partnered women have experienced IPV, compared to 23% in high-income countries (WHO, 2013). In Sri Lanka, community-based studies estimate that up to 35% of women have experienced violence from their intimate-partner in their lifetime (Guruge, Jayasuriya-Illesinghe, Gunawardena, & Perera, 2015), and 17% of ever-partnered women aged 15–49 years have experienced IPV in the past year (DCS, 2016). This is consistent with 12-month IPV estimates from neighbouring India (22%) and Pakistan (15%) (International Institute for Population Sciences, 2017; National Institute of Population Studies & ICF, 2019).

Although DV disproportionately affects women, men are also affected. A large cross-sectional survey of men in England attending general practice showed that 17% had experienced physical and emotional abuse in their lifetime, with emotional abuse being the most common form of violence experienced (Hester, Jones, Williamson, Fahmy, & Feder, 2017). However, evidence of the extent to which men are affected by DV and how they may be affected differently to women is scarce, especially in LMIC.

DV is defined in the present study as emotional, physical and sexual abuse perpetrated by any household member (e.g. intimate partner, parent, sibling) and fear of any household member in the last 12 months. To our knowledge, this is the first study to examine the level of risk of different forms of DV in the past year and its contribution to the overall burden of suicidal behaviour among men and women in South Asia.

This study draws on data collected as part of a large hospital-based case-control study investigating adverse childhood experiences and self-poisoning in Sri Lanka (Knipe et al., 2019a). The specific aims of this study were to assess (1) the association between exposure to at least one type of DV and self-poisoning; (2) the association and differential effects between exposure to specific types of abuse and self-poisoning; (3) if there is a dose-response effect between DV severity (i.e. experiencing multiple types of abuse) and self-poisoning; and (4) examine if these associations differ by sex.

Methods

Study setting

Data were collected from the Teaching Hospital Peradeniya (THP) and the local catchment area of the hospital. The THP is a tertiary referral hospital located in the highland Kandy District, Central Province of Sri Lanka, approximately 115 kilometres east from the capital city, Colombo. Kandy is a key administrative, commercial, and cultural centre with a total population of 1 375 382, of which 81% live in rural areas, 12% urban and 6% in the plantation sector (DCS, 2012). The majority of people living in Kandy identify as Sinhalese (74%), followed by Moor (14%) and Tamil (11%). Religious adherence is tied to ethnicity in Sri Lanka with the majority of Sinhalese identifying as Buddhist, most Moors as Muslim and Tamils as Hindu (DCS, 2012). The majority of the working population in Kandy (50%) are employed in the services sector, 28% in the industry sector, and 22% employed in the agricultural sector (DCS, 2012).

Study design and participants

A hospital-based case-control study design was used. A population-based control series was also recruited to address the potential for selection bias within the hospital control series.

Cases

Cases were patients aged 18 years and over admitted to the medical toxicology ward for self-poisoning between 18 July 2018 and 31 December 2018. All patients presenting to the THP for any method of deliberate (defined in this study as an act of non-fatal self-poisoning regardless of suicidal intent) or accidental self-poisoning are transferred to the medical toxicology ward for treatment and management. In total, 298 patients with any method of deliberate self-poisoning (hereafter referred to as self-poisoning) were recruited.

Controls

Sex and age (±5-year age strata) frequency-matched controls (N = 500) were recruited from the outpatient department and nearby specialist clinics of the same hospital over the same time period. Hospital controls were either accompanying visitors or outpatients presenting with conditions unrelated to the outcome of interest, such as cough, chest infection, or hypertension. Controls with a self-reported previous self-harm episode, regardless of the method and whether or not it required hospitalisation, were excluded from the analysis.

To address the potential for selection bias within the hospital control series, a population-based control series (N = 455) were also recruited from the local population. Two administrative divisions within the Kandy District (Gangawata Korale Divisional Secretary Division and Yatinuwara Divisional Secretary Division) were identified as the main population catchments for THP and were also the districts where the largest proportion of cases resided. Twelve villages (*Grama Niladhari* sub-divisions) out of a total of 159 were randomly selected from these divisions. Selected villages were compared with 2017 Census data to ensure similar distributions to the source population in terms of sex, age and ethnicity. Between 19 January 2019 and 2 April 2019, sex and age frequency-matched controls were recruited door to door. Due to logistical reasons such as the topography of the region, not every household within the sampling frame could be reached. For every household approached, only one participant matched on sex and age (± five years) was selected for interview. If more than one participant was eligible, the participant with the most recent birthday was selected for an interview.

Measures

Self-poisoning

The outcome – self-poisoning – and method of self-poisoning (e.g. medicinal overdose, pesticide, plant poison, or household chemicals) was initially identified through the toxicology ward's patient admission record, and verbally reconfirmed through patient self-report. Suicidal intention and lethality of the attempt were not assessed due to constraints on the length of the questionnaire. Self-harm due to other methods, for example, burning and cutting were not included in the study. Self-poisoning has been previously reported as the most common method of non-fatal self-harm (Eddleston et al., 2005; Rajapakse et al., 2013), and

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accounted for 98% of hospital presenting self-harm cases in a study covering 13 hospitals in the North Central Province of Sri Lanka (Knipe et al., 2019b).

Domestic violence

Data on the main exposure of interest, DV, were collected using the Humiliation, Afraid, Rape, and Kick (HARK) 4-item questionnaire. A previous study indicated that the HARK questionnaire accurately identifies partner violence with high specificity (95%) and sensitivity (81%) (Sohal, Eldridge, & Feder, 2007). The HARK questions identify women who have experienced four types of abuse – physical, sexual, humiliation/emotional abuse, and fear of an intimate partner in the past 12 months. The questionnaire was broadened to include abuse by any household member, not just by an intimate partner (online Supplementary Table S1). It was then translated, back-translated, and piloted in the two local languages (Sinhala and Tamil) with individuals at the outpatient ward of THP. No modifications were required after piloting with the local population. Responses to the items were measured on a binary scale where 0 = no abuse and 1 = exposure to abuse. A HARK score $\geqslant$1 indicates exposure to at least one type of abuse.

Other study factors

Sociodemographic data were collected using a questionnaire pretested with THP visitors and outpatients. Sociodemographic factors included age, sex, ethnicity, religion, marital status, household composition, and residential area. Socioeconomic status indicators were also collected and included educational attainment and vehicle ownership. All participants were asked, 'Have you ever previously self-harmed in the past?', and prior diagnosis of a mental disorder was also collected through self-report. Finally, participants were asked questions relating to current social support and sense of belonging at the household and community level. These questions relating to social support were derived from a large social capital community survey in the North Central Province of Sri Lanka (American Foundation for Suicide Prevention, 2018).

Data collection

Data were collected via face-to-face interview. All interviews were conducted by trained data collectors in the participant's preferred language (Sinhala, Tamil or English) in a private setting to ensure responses would not be influenced by another person and for patient safety. Interviewers were not blinded to the case or control status of the participant and the same interviewers who recruited cases also recruited controls. In order to minimise interviewer bias, the interviewers were given a standard script which they were requested to follow regardless of case status. The supervisor (PB) regularly shadowed interviewers to ensure adherence to the script. A participant safety and distress protocol was provided to the data collection team and training was provided on how to deal with a distressed participant, described in detail elsewhere (Knipe et al., 2019a). In brief, participants who reported experiencing suicidal thoughts daily during the preceding 2 weeks, were referred to the Psychiatry Clinic, THP for further management and follow up. If DV was disclosed, the participant was discretely provided information about support available locally and if appropriate, the patient was also referred to the psychiatry clinic. The study was ethically approved by the University of Peradeniya, Faculty of Medicine, Ethics Review Committee.

Statistical analysis

Logistic regression models, stratified by sex, were conducted on complete data to estimate the association between study factors and self-poisoning. Analyses were stratified by sex *a priori* given the epidemiology of both DV and self-poisoning differs between the sexes. Multivariable models were conducted to adjust for potential confounders. The main Model 1 adjusted for known confounders unlikely to change as a consequence of DV (age, ethnicity and religion). Model 2 adjusted for potential confounders (marital status, education level, assets – vehicle ownership) in addition to confounders in Model 1. Finally, in addition to Model 2 covariates, Model 3 adjusted for social support, household composition, and diagnosis of a mental disorder, identified in the literature as related factors in the association between DV and suicidal behaviour (Abramsky et al., 2011; Devries et al., 2013; McLaughlin et al., 2012). Interaction terms were created and entered into Model 1 to test effect measure modification by sex. Sensitivity analyses were conducted using the community control series to assess differences in the association between DV and self-poisoning. Furthermore, a secondary analysis was conducted to examine the association between household composition and self-poisoning risk to provide additional insights. Regression modelling was conducted in Stata Version 15.1 (StataCorp, 2017) using the *logistic* function. Adjusted (Model 1) population attributable fractions (PAF) for DV, using the prevalence of exposure from the control group, were obtained from the *punafcc* post-estimation function in Stata based on the method used by Greenland and Drescher (1993).

Results

Study sample

In total, 298 cases of self-poisoning were recruited with a response rate of 87% (Fig. 1). Seven cases were subsequently excluded in the analysis due to missing data, resulting in 291 complete cases for the analysis. No marked differences in sex were observed between total excluded and included patients, however, those excluded were older. The most common method of self-poisoning was an overdose of medicinal substances (65%), followed by ingestion of pesticides (21%), and plant poisons (5%). A total of 500 hospital controls were recruited with a response rate of 62%, of which 2% ($N = 10$) were subsequently excluded due to missing data, resulting in 490 controls included in the analysis (Fig. 1). A similar response rate of 63% was observed for community controls, five of which were excluded due to missing data ($N = 450$; Fig. 1). Overall, more female than male controls responded. No further data were collected on non-respondents. Both control groups shared similar study characteristics, however, the hospital control series more closely matched the cases in terms of the residential area. Therefore, a decision was made to use the hospital control series in the main analysis and conduct a sensitivity analysis using the community control series.

Prevalence of DV and characteristics of the sample are summarised in Table 1. Among those who had self-poisoned, 50% (95% CI 42–58) of women and 36% (95% CI 28–44) of men had been exposed to at least one type of DV within the previous 12 months, compared to 19% (95% CI 15–24) and 18% (95% CI 13–24) among female and male controls, respectively. Emotional abuse showed the highest prevalence among cases and controls with similar estimates across the sexes. Exposure to physical violence and fear was higher among cases compared to controls, with

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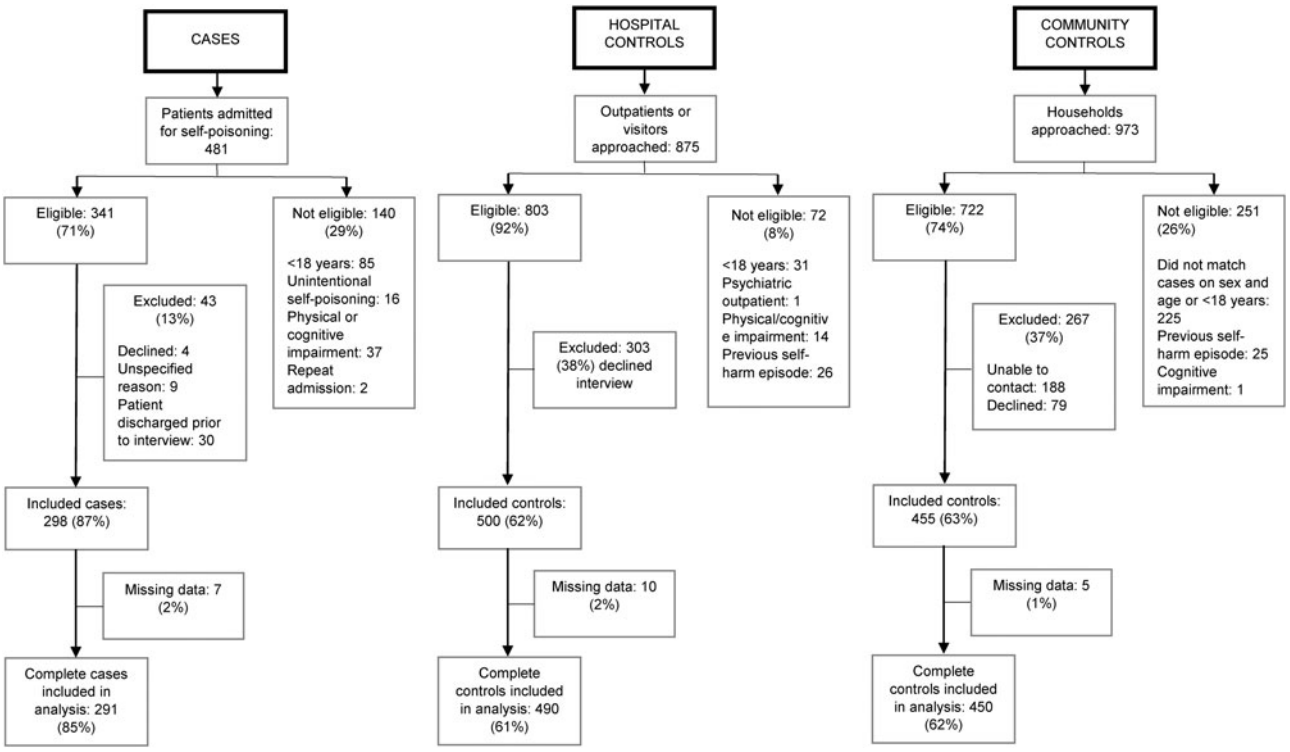


Fig. 1. Participant recruitment for hospital presenting self-poisoning cases, hospital controls and community controls.

marked differences among women but not men. Eight cases of sexual violence were reported overall, half of which were reported by female cases. Exposure to multiple forms of abuse was higher among female cases (23%) compared to female controls (4%) and male cases (5%). Female cases exposed to DV reported a higher rate of previous self-harm (40%) than cases with no abuse (16%), no marked differences were found for male cases.

Domestic violence and self-poisoning

Exposure to at least one type of DV was strongly associated with self-poisoning compared with no experience of abuse for both females (OR 4.08, 95% CI 2.60–6.41, $p < 0.001$) and males (OR 2.52, 95% CI 1.51–4.21, $p < 0.001$) following adjustment for age, ethnicity and religion (Table 2). Among women, all types of DV examined showed strong associations with self-poisoning, with the largest point estimate for physical violence (OR 14.07, 95% CI 5.87–33.72, $p < 0.001$). Among men, emotional abuse showed the largest point estimate (OR 2.75, 95% CI 1.57–4.82, $p < 0.001$), compared to no abuse. A dose-response association was also evident among women for the scale of violence, with an increasing risk of self-poisoning for one type of abuse (OR 2.84, 95% CI 1.69–4.78, $p < 0.001$), and multiple types of abuse (OR 8.50, 95% CI 4.12–17.56, $p < 0.001$) (Table 2). There was no statistical evidence that sex modified the associations observed. The strong associations observed were maintained after adjusting for potential confounders and related factors (Model 2 and 3) (Table 2). Social support, and to a lesser extent marital status and a diagnosis of a mental disorder, attenuated the effect sizes among women (Table 2).

PAF estimates for exposure to at least one type of DV were higher for women (38.0% 95% CI 32.2–43.3) than men (21.6% 95% CI 14.0–28.5). Among women, PAF estimates were in a similar range for physical violence (28.5% 95% CI 26.5–30.3), fear of an intimate partner/household member (29.9% 95% CI 25.9–33.7), and emotional abuse (28.3% 95% CI 22.6–33.6). Whereas PAF estimates for men were substantial only for emotional abuse (20.2% 95% CI 13.5–26.4).

Sensitivity analysis based on comparisons with the community control series overall showed similar associations in terms of direction for both sexes and magnitude for males (online Supplementary Table S2). Stronger associations were found among women, especially for exposure to at least one type of abuse (OR 5.14, 95% CI 3.23–8.18), and a stronger dose-response (ORs ranging from 3.98 to 9.42), compared to similar associations based on comparisons with the hospital control series (online Supplementary Table S1). Secondary analysis of household composition and self-poisoning risk, adjusting for age, ethnicity, and religion, indicated that among women, the presence of in-laws increased self-poisoning risk (OR 2.49, 95% CI 1.38–4.51) when compared to nuclear household structures. Among men, in addition to the nuclear household members, the presence of extended family (grandparents/grandchild) showed the largest point estimate (OR 3.41 95% CI 1.24–9.44) (online Supplementary Table S2).

Discussion

Exposure to DV was strongly associated with self-poisoning for both men and women. Physical abuse and emotional abuse had the largest point estimates for women and men respectively, and exposure to more than one type of abuse was particularly strongly associated with an increased risk in self-poisoning for women.

Although limited to violence perpetrated by an intimate partner, the WHO study estimate for the association between

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Table 1. Self-poisoning in adults aged ⩾18 years, Kandy, Sri Lanka: distribution by domestic violence and other study factors

	Females		Males	
	Cases (n = 154) n (%)	Controls (n = 289) n (%)	Cases (n = 137) n (%)	Controls (n = 201) n (%)
Domestic violence				
At least one type of abuse (*v.* no abuse)	77 (50.0)	55 (19.0)	49 (35.8)	36 (17.9)
Type of abuse				
Afraid of household member (*v.* no abuse)	44 (36.4)	21 (8.2)	9 (9.3)	10 (5.7)
Emotional (*v.* no abuse)	48 (38.4)	39 (14.3)	41 (31.8)	27 (14.1)
Physical (*v.* no abuse)	33 (30.0)	7 (2.9)	5 (5.4)	5 (2.9)
Sexual (*v.* no abuse)	4 (4.9)	2 (0.9)	1 (1.1)	1 (0.6)
Scale of abuse				
No abuse	77 (50.0)	234 (81.0)	88 (64.2)	165 (82.1)
Single type of abuse	42 (27.3)	43 (14.9)	42 (30.7)	30 (14.9)
Multiple (2–4) types of abuse	35 (22.7)	12 (4.2)	7 (5.1)	6 (3.0)
Other study factors				
Age				
18–30	111 (72.1)	196 (67.8)	74 (54.0)	110 (54.7)
31–45	32 (20.8)	62 (21.5)	35 (25.6)	49 (24.4)
⩾46	11 (7.1)	31 (10.7)	28 (20.4)	42 (20.9)
Ethnicity				
Sinhala	118 (76.6)	278 (96.2)	109 (79.6)	170 (84.6)
Non-Sinhala	36 (23.4)	11 (3.8)	28 (20.4)	31 (15.4)
Religion				
Buddhist	115 (74.7)	272 (94.1)	104 (75.9)	168 (83.6)
Non-Buddhist	39 (25.3)	17 (5.9)	33 (24.1)	33 (16.4)
Marital status				
Married	84 (54.6)	127 (43.9)	69 (50.4)	101 (50.3)
Never married	62 (40.3)	155 (53.6)	60 (43.8)	98 (48.8)
Divorced/separated/ spouse dead	8 (5.2)	7 (2.4)	8 (5.8)	2 (1.0)
Education				
Passed A/L	44 (28.6)	155 (53.6)	20 (14.6)	91 (45.3)
Passed O/L	55 (35.5)	74 (25.6)	37 (27.0)	58 (28.9)
Grades 1–10, or no schooling	55 (35.7)	60 (20.8)	80 (58.4)	52 (25.9)
Assets				
Car, tractor, or bus	27 (17.5)	55 (19.0)	23 (16.8)	51 (25.4)
Motorbike or 3-wheeler	57 (37.0)	122 (42.2)	48 (35.0)	78 (38.8)
No vehicle	70 (45.5)	112 (38.8)	66 (48.2)	72 (35.8)
Social support				
Strong (tertile 1)	30 (19.5)	103 (35.6)	28 (20.4)	64 (31.8)
Medium (tertile 2)	40 (26.0)	107 (37.0)	39 (28.5)	69 (34.3)
Poor (tertile 3)	84 (54.6)	79 (27.3)	70 (51.1)	68 (33.8)
Household composition				
Nuclear (spouse/child/parent/sibling)	103 (66.9)	220 (76.1)	94 (68.6)	159 (79.1)
Extended (nuclear/grandchild/grandparent)	7 (4.6)	20 (6.9)	13 (9.5)	6 (3.0)

(*Continued*)

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Table 1. (*Continued.*)

	Females		Males	
	Cases ($n = 154$) *n* (%)	Controls ($n = 289$) *n* (%)	Cases ($n = 137$) *n* (%)	Controls ($n = 201$) *n* (%)
Presence of in-laws (parent/child in-law)	29 (18.8)	29 (10.0)	19 (13.9)	17 (8.5)
Other composition	15 (9.7)	20 (6.9)	11 (8.0)	19 (9.5)
Ever diagnosed with mental disorder				
No	134 (87.0)	285 (98.6)	123 (89.8)	197 (98.0)
Yes	20 (13.0)	4 (1.4)	14 (10.2)	4 (2.0)

A/L, Advanced Level; O/L, ordinary level.

Table 2. Multivariable models for the association between domestic violence and self-poisoning in adults aged ⩾18 years, Kandy Sri Lanka

	Females			Males		
	Model 1 OR (95% CI)	Model 2 OR (95% CI)	Model 3 OR (95% CI)	Model 1 OR (95% CI)	Model 2 OR (95% CI)	Model 3 OR (95% CI)
Domestic violence						
At least one type of abuse (*v.* no abuse)	4.08 (2.60–6.41)	3.21 (1.99–5.16)	2.25 (1.34–3.79)	2.52 (1.51–4.21)	3.14 (1.76–5.61)	2.63 (1.42–4.85)
Type of abuse						
Afraid of household member (*v.* no abuse)	5.65 (3.09–10.35)	4.30 (2.25–8.19)	2.89 (1.43–5.86)	1.55 (0.58–4.13)	1.25 (0.43–3.69)	1.08 (0.36–3.26)
Emotional (*v.* no abuse)	3.67 (2.19–6.15)	3.15 (1.82–5.45)	2.06 (1.11–3.81)	2.75 (1.57–4.82)	3.90 (2.03–7.52)	3.29 (1.64–6.60)
Physical (*v.* no abuse)	14.07 (5.87–33.72)	9.93 (3.96–24.88)	6.07 (2.27–16.21)	1.99 (0.56–7.13)	2.03 (0.50–8.26)	1.79 (0.42–7.54)
Sexual (*v.* no abuse)	6.03 (1.03–35.38)	6.86 (1.00–47.21)	4.93 (0.63–38.46)	2.31 (0.10–51.39)	4.41 (0.98–1.04)	3.92 (0.11–138·75)
Scale of abuse						
No abuse	1.00	1.00	1.00	1.00	1.00	1.00
Single type of abuse	2.84 (1.69–4.78)	2.35 (1.36–4.10)	1.89 (1.05–3.41)	2.61 (1.52–4.48)	3.40 (1.84–6.29)	2.88 (1.51–5.48)
Multiple (2–4) types of abuse	8.50 (4.12–17.56)	6.23 (2.89–13.42)	3.51 (1.48–8.34)	2.08 (0.65–6.63)	1.95 (0.53–7.26)	1.45 (0.36–5.79)

OR (Odds ratio) = 1.00 (Referent group).
Model 1 adjusted for age, ethnicity, and religion.
Model 2 adjusted for age, ethnicity, religion, marital status, education level, and assets (vehicle ownership).
Model 3 adjusted for Model 2 covariates, and diagnosis of mental disorder, social support, household composition.

exposure to at least one type of violence and a suicide attempt among women (OR 3.8) (Ellsberg, Jansen, Heise, Watts, & Garcia-Moreno, 2008), is similar to the present study (OR 4.1), while estimates in South Asian settings are slightly higher, ranging between OR 6.4 and 7.21 (Chowdhary & Patel, 2008; Paiman et al., 2019). The strong association between physical violence and self-poisoning among women is supported by studies in LMIC settings which have reported the physical and sexual violence to be more strongly associated with suicidal behaviour (Chowdhary & Patel, 2008; Hassanian-Moghaddam, Zamani, & Sarjami, 2016; Ishida, Stupp, Melian, Serbanescu, & Goodwin, 2010). There is substantial evidence that physical violence is concomitant with emotional, psychological, and sexual abuse, cumulatively increasing the risk of suicide attempts (Devries et al., 2011; McLaughlin et al., 2012). A dose-response association was found between experiencing multiple types of abuse and self-poisoning among women but not for men. Given any exposure to DV demonstrated a higher risk of self-poisoning, and cases exposed were more likely to report a previous self-harm episode, identification of any exposure and severity of abuse should be part of the routine clinical assessment of self-poisoning patients, and appropriate local services developed or identified to support these individuals to reduce the risk of repetition.

Sexual violence was associated with self-poisoning among women as has been reported elsewhere (Chowdhury, Brahma, Banerjee, & Biswas, 2009; Devries et al., 2011, 2013). The weak statistical evidence is due to the small number of women reporting sexual violence [11 (0.9%) of all 1231 participants]. It is likely this was under-reported by participants and is considerably lower than previously reported estimates of 5–18% (DCS, 2016; Guruge et al., 2015; Jayatilleke et al., 2011). Socio-cultural factors such as stigma, sensitivity around discussions of sexual activity, and marital rape not being considered a punishable offence in Sri Lanka may have limited disclosure and affected the magnitude of the observed association. Detailed, in-depth interviews may overcome the socio-cultural barriers to disclosing sexual violence in this context.

There are relatively few studies globally, particularly in LMIC, that have measured DV against men and its association with

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suicidal behaviour, and those that have, are often limited to physical violence (McLaughlin et al., 2012). Emotional abuse showed the highest prevalence among men and women, and the largest point estimate among men when compared to other types of abuse. Similarly, previous studies found that emotional abuse was the most common type of DV experienced by men in the past 12 months (Hester et al., 2017; Office for National Statistics, 2019). Further qualitative research examining DV in men and its relationship with self-harm in LMIC settings is needed to better understand this association.

Psychological abuse, measured by fear of an intimate partner or household member showed a strong association (OR 5.65) with self-poisoning among women. Acute fear concomitant with violent incidents, in addition to chronic fear acquired over time, has been shown to increase psychological distress in high-income countries (HIC) and LMIC settings (Devries et al., 2013; Richardson, Nandi, Jaswal, & Harper, 2020). The exact mechanism with which the experience of DV (in whatever form) leads to suicidal behaviour in Sri Lanka has not been explored. Theoretical models developed from non-HIC settings are lacking. Given that it has been argued that suicidal behaviour is different in LMIC *v.* HIC (Akotia, Knizek, Hjelmeland, Kinyanda, & Osafo, 2019; Colucci & Lester, 2012; Knipe et al., 2019c; Widger, 2015), we have refrained from using traditional theoretical models to explain suicidal behaviour in this instance.

Social support substantially attenuated the observed association between DV and self-poisoning. It has been reported previously that poor social support could be both a precursor and consequence of DV, and could potentially moderate the relationship between DV and self-harm (Coker et al., 2002; Fedina et al., 2019; McLaughlin et al., 2012). Future qualitative and prospective studies should be undertaken to contribute to a theoretical understanding of the link between DV and suicidal behaviour within the context of LMIC, and to elucidate the role of social support and other potential modifiable/mediating factors in the relationship between DV and self-harm.

Strengths and Limitations

This study has a number of key strengths. To the best of our knowledge, this is the first large study to quantify the association between DV and self-poisoning among men and women in South Asia and examine its contribution to the overall burden of suicidal behaviour. The study also addresses key gaps identified in the literature, including the examination of differential effects by type of DV, effects of exposure to multiple types of abuse, and exploration of potential associated factors. Furthermore, there is a dearth of evidence examining DV in men, particularly in LMIC settings, this study presents novel findings of the role of DV in male self-poisoning. Culturally adapted and translated versions of a validated instrument for the assessment of DV and the use of pretested forms for the assessment of other study variables were also key strengths of the study.

Sensitivity analyses using a community control series to address possible selection bias also strengthened the study. These findings suggest that, in this context, hospital controls did not appear to bias the results substantially towards the null as is often the case in hospital-based case-control studies. This has critical implications for future study designs examining self-harm in resource-poor settings. In the absence of primary care infrastructure, 'clinical' controls presenting to hospital or tertiary care services may be more similar to exposure distributions in the source population than in hospital-based case-control studies in high-income contexts.

There are a number of methodological considerations in interpreting the findings from this study. Interpretation of a causal relationship between DV and self-poisoning is limited due to the retrospective nature of the study design. Furthermore, a key limitation of this study is the potential for selection bias. Despite an overall high response rate, the response rate was lower among the control group (62%) compared to cases (87%), and it is possible that excluded controls may differ in comparison to controls included. Limited information was collected on excluded controls therefore it is not possible to assess the extent of this potential selection bias. The hospital controls recruited did however broadly match the source population in terms of age, sex, ethnicity, and religion.

Additional selection bias may have also been introduced through the inclusion of outpatients in the hospital control group as they may have a different exposure distribution compared to the source population. Notably, the 12-month prevalence of DV in the hospital control group (19%) was consistent with nationally representative 12-month prevalence estimates (17%) and regional estimates [which vary between 19% (Jayatilleke et al., 2011) and 25% (DCS, 2016)]. Moreover, sensitivity analyses using the community control group indicated broadly similar findings, although stronger point estimates were evident among women. Possible underreporting of DV in the community control series (16%) may explain the magnified estimates and could be attributed to interviews being conducted in the home environment, where participants may be more cautious and less inclined to disclose abuse.

Another limitation of the study is the potential for recall bias. Individuals who have self-harmed may be less reticent about acknowledging DV and be more likely to recall DV related to the self-harm episode, than the control group, leading to an overestimation of the association. All participants were asked if they had experienced DV within the last 12 months, this timeframe would minimise the risk of recall bias. It should be acknowledged that the HARK questionnaire used in the present study has not been validated for use in men and within the Sri Lankan population, however, the questionnaire was pre-tested with the local population and as previously discussed, any DV exposure in the last 12 months among female controls in this study was consistent with the Sri Lankan DHS survey and other studies in Sri Lanka. As previously discussed, due to socio-cultural factors associated with the study setting and limited time for in-depth interviewing, some participants may have been reluctant to disclose particularly sensitive issues such as sexual abuse.

Finally, when interpreting the PAFs, it is important to consider that these estimates assume a causal relationship between exposure and outcome. Given the strong and consistent association previously documented in the international literature between DV and suicidal behaviour, the assumption in the present study is reasonable. An additional assumption of the PAF is that removing the exposure will not affect other potential risk factors. This assumption is more difficult to uphold given the interrelationship between a range of social factors and DV associated self-harm. However, well-documented confounders were adjusted for in estimating the PAFs. Furthermore, the underlying DV prevalence used, derived from the control group, was consistent with regional estimates, heightening the sensitivity of the PAFs.

Given the high burden of DV and the strength of the association with self-poisoning, targeting DV prevention may result

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in substantial reductions in suicidal behaviour and other DV-related adverse health outcomes. At the clinical level, identification of any type of DV and severity of abuse should be part of the routine clinical assessment of patients presenting with self-harm, followed by referral, as appropriate, to local DV support services. In Sri Lanka, 'Friendly Haven' counselling centres (*Mithuru Piyasa/Natpu Nilayam*) have been established at selected government hospitals to provide first-line support to women experiencing DV, with evidence of increasing uptake (WHO, 2018). Enhanced integration between such centres and psychiatric services may be valuable as psychotherapies for women experiencing DV in LMIC have also been shown to be effective (Keynejad, Hanlon, & Howard, 2020). However, strategies should not be limited to biomedical interventions. Community-based strategies that have involved community ambassadors, capacity building of frontline workers (e.g. police officers, health care workers, teachers), together with the dissemination of DV learning materials have shown promising evidence in South Africa (Pronyk et al., 2006) and Uganda (Wagman et al., 2015) in reducing DV and may prove effective in Sri Lanka.

Supplementary material. The supplementary material for this article can be found at https://doi.org/10.1017/S0033291720002986

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Conflict of interest. None.

Ethical standards. The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as revised in 2008.

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