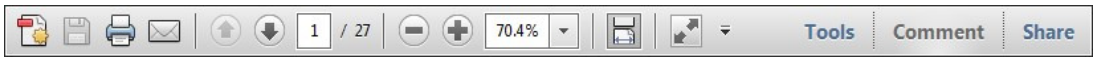
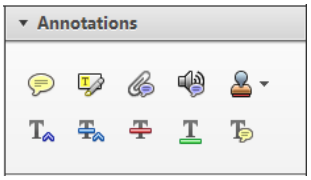
Once you have Acrobat Reader open on your computer, click on the Comment tab at the right of the toolbar:



This will open up a panel down the right side of the document. The majority of tools you will use for annotating your proof will be in the Annotations section, pictured opposite. We've picked out some of these tools below:

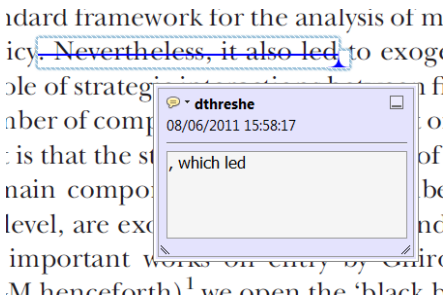


1. Replace (Ins) Tool – for replacing text.

Strikes a line through text and opens up a text box where replacement text can be entered.

How to use it

- Highlight a word or sentence.
- Click on the Replace (Ins) icon in the Annotations section.
- Type the replacement text into the blue box that appears.

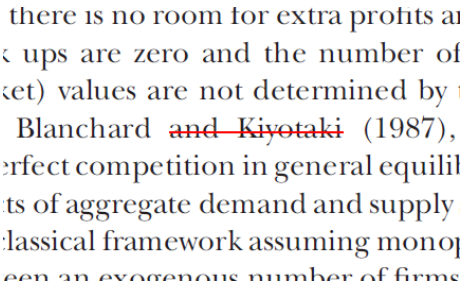


2. Strikethrough (Del) Tool – for deleting text.

Strikes a red line through text that is to be deleted.

How to use it

- Highlight a word or sentence.
- Click on the Strikethrough (Del) icon in the Annotations section.

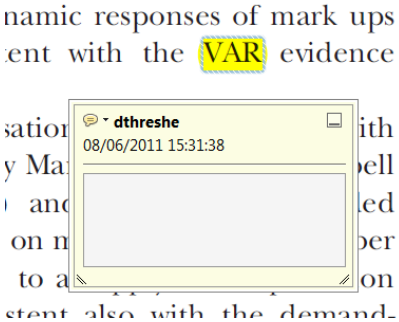


3. Add note to text Tool – for highlighting a section to be changed to bold or italic.

Highlights text in yellow and opens up a text box where comments can be entered.

How to use it

- Highlight the relevant section of text.
- Click on the Add note to text icon in the Annotations section.
- Type instruction on what should be changed regarding the text into the yellow box that appears.

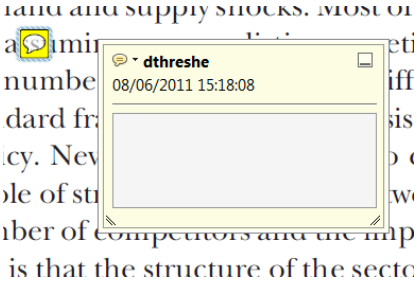


4. Add sticky note Tool – for making notes at specific points in the text.

Marks a point in the proof where a comment needs to be highlighted.

How to use it

- Click on the Add sticky note icon in the Annotations section.
- Click at the point in the proof where the comment should be inserted.
- Type the comment into the yellow box that appears.

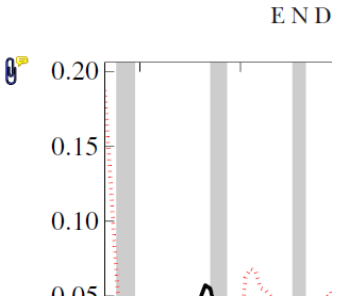


5. Attach File Tool – for inserting large amounts of text or replacement figures.

Inserts an icon linking to the attached file in the appropriate pace in the text.

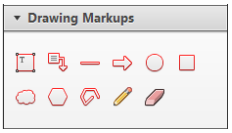
How to use it

- Click on the Attach File icon in the Annotations section.
- Click on the proof to where you'd like the attached file to be linked.
- Select the file to be attached from your computer or network.
- Select the colour and type of icon that will appear in the proof. Click OK.



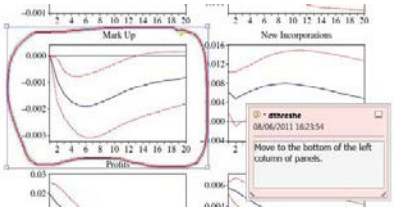
6. Drawing Markups Tools – for drawing shapes, lines and freeform annotations on proofs and commenting on these marks.

Allows shapes, lines and freeform annotations to be drawn on proofs and for comment to be made on these marks.



How to use it

- Click on one of the shapes in the Drawing Markups section.
- Click on the proof at the relevant point and draw the selected shape with the cursor.
- To add a comment to the drawn shape, move the cursor over the shape until an arrowhead appears.
- Double click on the shape and type any text in the red box that appears.



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AOGS MAIN RESEARCH ARTICLE

Prevalence of emotional, physical and sexual abuse among pregnant women in six European countries

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Key words
Abuse, violence against women, pregnancy, prevalence

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Conflicts of interest
The authors have stated explicitly that there are no conflicts of interest in connection with this article.

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Abstract

Objectives. The primary objective was to investigate the prevalence of a history of abuse among women attending routine antenatal care in six northern European countries. Second, we explored current suffering from reported abuse. *Design.* A prospective cohort study. *Setting.* Routine antenatal care in Belgium, Iceland, Denmark, Estonia, Norway, and Sweden between March 2008 and August 2010. *Population.* A total of 7174 pregnant women. *Methods.* A questionnaire including a validated instrument measuring emotional, physical and sexual abuse. *Main outcome measure.* Proportion of women reporting emotional, physical and sexual abuse. Severe current suffering defined as a Visual Analogue Scale score of ≥6. *Results.* An overall lifetime prevalence of any abuse was reported by 34.8% of the pregnant women. The ranges across the six countries of lifetime prevalence were 9.7–30.8% for physical abuse, 16.2–27.7% for emotional abuse, and 8.3–21.1% for sexual abuse. Few women reported current sexual abuse, 0.4% compared with 2.2% current physical abuse and 2.7% current emotional abuse. Current severe suffering was reported by 6.8% of the women who reported physical abuse, 9.8% of those who reported sexual abuse and 13.5% for emotional abuse. *Conclusion.* A high proportion of pregnant women attending routine antenatal care report a history of abuse. About one in ten of them experiences severe current suffering from the reported abuse. In particular, these women might benefit from being identified in the antenatal care setting and being offered specialized care.

Abbreviations: NorAQ, NorVold Abuse Questionnaire; G, Goodman–Kruskal γ; OR, odds ratio.

Introduction

Abuse of women and girls is a widely recognized public health issue (1). The term abuse is generally used when violence or acts of violation are part of an ongoing pattern or behavior. The World Health Organization defines violence against women as "any act of gender-based violence that results in, or is likely to result in, physical, sexual or mental harm or suffering to women, including threats of such acts, coercion or arbitrary deprivation of liberty, whether occurring in public or private life" (1,2).

When acts of violence and abuse occur within the privacy of the home they can also be defined as domestic violence (3), whereas violence inflicted by a current or previous partner falls under the term intimate partner violence (3). Partner violence is the leading cause of death among women of reproductive age (4,5). Other detrimental consequences of abuse on mental and physical health are well documented (6–9). Evidence suggests that women are particularly vulnerable to abuse during pregnancy and the postnatal period (10,11). Violence and abuse have been shown to influence women's health during pregnancy and birth and may affect the health of the fetus and newborn child (12–16). The different pathways described are direct injury, neurobiological changes, and an increase in health-detrimental behaviors such as eating disorders and drug abuse (13,15,17).

Previously published estimates of prevalence of past and present violence and abuse among pregnant women vary greatly and may be difficult to compare, as they differ regarding the type of abuse assessed, time of occurrence, and perpetrator (11). In addition, methodological factors such as study design, measuring instrument and population studied can influence results (11). There are two previous studies presenting internationally comparable data on the population prevalence of violence against women and estimates of the occurrence during pregnancy (7,18). These studies were restricted to intimate partner violence and so excluded abuse that women had experienced as a child and violence perpetrated by people other than a present or previous intimate partner (7,18). The method in both studies was a standardized household survey including women at all ages and asking them to recall whether violence had occurred during pregnancy (7,18). Although these studies present valuable information, their relevance to a European setting is limited (7,18). There are no international population-based studies conducted among pregnant women attending routine antenatal care, estimating the prevalence of physical, emotional and sexual violence abuse experienced as a child or as an adult. This was the primary aim of our study. Second, we explored current suffering from reported abuse.

Material and Methods

The Bidens study, a six-country (Belgium, Iceland, Denmark, Estonia, Norway, and Sweden) cohort study of unselected pregnant women, was the result of a European Union-funded collaboration between the Norwegian University of Science and Technology (NTNU) and partners from universities and hospitals in ~~six~~ European countries. A short description of the study sites is given as Supporting Information (Table S1). There were between one and seven urban antenatal care sites of data collection in each country with the most in Norway (five sites) and Sweden (seven sites).

Recruitment took place between March 2008 and August 2010. A total of 7200 women who consented, subsequently completed a questionnaire and allowed the extraction of specified data on their delivery from their medical notes. Due to country-specific organization as well as the requirements of local ethics committees, minor variations in the recruitment procedure occurred.

In Belgium, women were approached by the midwife or secretary when attending antenatal care. Women were asked to complete the questionnaire in the privacy of a separate room. In Iceland women were recruited when attending routine ultrasound and returned completed forms by mail. In Denmark women were given information about the study when attending early routine ultrasound screening and were mailed the questionnaire later. They returned the questionnaire by mail or when attending their next ultrasound examination. In Estonia women were invited to participate while visiting for an antenatal consultation. After completing the questionnaire, it was left in a mailbox at the clinic. In Norway, women received the questionnaire by mail and returned it by mail, after attending routine ultrasound. Nonresponders were sent one reminder. In Sweden, the questionnaire was administered to women when attending routine glucose tolerance tests and filled out during the 2 hours between the blood samplings.

The right to obtain information on nonparticipating women varied between countries and hence the basis for calculating response rates. In Belgium and Sweden regis-

Key Message

A history of abuse is common among pregnant women in northern Europe. About one in ten women reports severe suffering from previous or current abuse. Routine antenatal care provides a window of opportunity to identify suffering and offer specialized care.

trations of nonparticipants was not allowed, the response rate was estimated at 50% and 78%, respectively. In Iceland and Denmark the response rate was 65% and 57.3%, respectively (no reminder). In Estonia, the response rate was 90%, based on number of questionnaires given to the assigned study midwives and number of filled out forms returned. In Norway the participation rate was 50% (one reminder). The estimated response rate varied between 50% in Norway to 90% in Estonia.

All women required sufficient language skills to fill out the form. In Estonia women could choose to complete an Estonian or Russian language questionnaire. In Belgium, Iceland and Denmark women less than 18 years of age were excluded. In Denmark, only women from the local geographical area were invited. In Belgium, women who could not be separated from their accompanying person were not recruited. In Iceland, Denmark and Norway, women with major fetal pathologies were excluded from the study.

The questionnaire included questions on socio-economic background, general and mental health and obstetric history. The questions on abuse were taken from the NorVold Abuse Questionnaire (NorAQ), which was developed in a Nordic multi-centre study among gynecological patients (19). This validated instrument includes 13 descriptive questions measuring emotional, physical and sexual abuse (20). A complete version of the questionnaire was developed in English. Where a previously translated version of the NorAQ was available, this was used. Additional items of the ~~NorAQ~~ questionnaire were translated into the required languages by a native speaker (Flemish, Icelandic, Danish, Estonian, Russian, Norwegian and Swedish) and then translated back again into the source language. The original and back-translated versions were used to determine the final consensus version.

Emotional, physical, and sexual abuse were assessed in three identically structured sections. For each type and level of abuse the answer categories were no, yes as a child, yes as an adult, or yes both as a child and as an adult. These were classified according to the most severe level reported (mild, moderate, and severe). Two items addressing 'mild sexual abuse with no genital contact' and 'mild humiliating sexual abuse' were combined in the analysis into one category of 'mild sexual abuse'. For each type of abuse women were asked if they experienced the indicated abuse during the past 12 months, which was coded as current. The degree of current suffering was measured on a visual analogue scale (0–10) and recoded into no suffering (0), moderate suffering (1–5) and severe current suffering (≥6), based on the distribution of the data. Women were defined as having experienced any abuse if they answered yes to at least one of the questions of sexual, emotional and physical abuse. The question measuring mild physical abuse has shown low specificity in the validation study (20). Hence results are presented including and excluding this item.

The study was conducted in accordance with the ethical guidelines developed by the World Health Organization (21), which highlight the importance of ensuring women's safety, confidentiality and privacy. The information letter instructed women to complete the form in a place where they could be undisturbed, and included local telephone numbers and e-mail addresses to contact if help was desired. Additionally, in Belgium, Estonia and Sweden the participants had the opportunity to complete the questionnaires at the clinic, and measures were taken to avoid accompanying persons being present while they filled out the survey. Formal approvals of local ethics committees and data protection agencies were obtained at all sites, as listed below.

In Belgium the Ethics Committee of Ghent University acted as the central ethics committee for the study; U(Z) Gent, 22012008/B67020072813, date of approval: 1 February 2008, Waregem hospital date added: 21 October 2008. In Iceland the scientific board approved the study (24.06.2008-*VSN-b2008030024/03-15*) according to Icelandic regulations, date: 24 June 2008. In Denmark, even though ethical approval for non-invasive studies is not required, the study was presented to the Research Ethics Committee of the Capital Region, who found no objections to the study (H-A-2008-002), date: 11 February 2008. Permission was obtained from the Danish Data Protection Agency (J.nr. 2007-41-1663). In Estonia, ethical permission was given by the Ethics Review Committee on Human Research of the University of Tartu, Estonia; 190/M-29, 192/-22, 196/X-2, date: 17 December 2007, East-Tallinn Central Hospital added: 19 January 2009, Russian language and prolonged period added: 22 February 2010, East-Viru Central Hospital added: 26 April 2010. In Norway, the Regional Committee for Medical Research Ethics in North approved the study (72/2006), date: 29 August 2007; and the Data Inspectorate (NSD) (15214/3/) also approved the study, date: 19 December 2007. In Sweden, the study was approved by the Regional Ethics Committee in Stockholm (2006/354-31/1), date: 14 June 2006.

The data were anonymized before analysis.

Statistical analysis

Pearson's chi-squared test was applied to assess demographic and abuse differences between countries. Level of significance was set at $p < 0.05$, two-sided Kruskal–Wallis test was used to compare medians between countries for the visual analogue scale scores for current suffering. The correlation between the level of severity of emotional,

physical and sexual abuse and current suffering was tested by Goodman–Kruskal γ (G). For comparison between countries of the proportion of lifetime abuse for each type of abuse we calculated odds ratios (OR) with 95% CI using logistic regression analysis adjusting for age, education and gestational age when completing the questionnaire with the largest group Norway as a reference. Analyses were performed in PASW Statistics version 18.0 (SPSS Inc., Chicago, IL, USA).

Results

A total of 7200 women responded, 26 women were excluded because of missing response to the NorAQ, leaving a total of 7174 in the study: 861 from Belgium, 602 from Iceland, 1290 from Denmark, 975 from Estonia, 2424 Norway and 1022 from Sweden. Sociodemographic characteristics are presented in Table 1. Significant differences between countries in our sample were observed: nearly a quarter of the women were below 25 years of age in Estonia, but only around 3% were below 25 years of age in Denmark. Norway had the highest proportion of educated women (13 years or more of education), while the lowest proportion was found in Estonia. Most women were married or cohabiting. Iceland and Estonia had the highest proportion of women not married or cohabiting, as well as the highest proportion of women who were unemployed or on social benefit.

In all, 3530 women (49.2%) reported any type of emotional, physical or sexual abuse, 34.8% when excluding mild physical abuse. Of all the women, 523 (7.3%) reported emotional abuse only, 460 (6.4%) sexual abuse only and 492 (6.9%) physical abuse only (excluding mild physical abuse). One hundred and eighty-eight (2.6%) women reported both emotional and sexual abuse, 355 (4.9%) emotional and physical abuse, 187 (2.6%) physical and sexual abuse, and 294 (4.1%) all three types of abuse.

Tables 2–4 show the proportions of women for each country who reported emotional, physical and sexual abuse by age at time of abuse, severity of the abuse, whether it had occurred within the last year, lifetime abuse, and current suffering. Current moderate or severe suffering from reported emotional abuse was highest among Icelandic women (88.8%) and lowest among Estonian women (68.1%) (Table 2). Seventy percent of the Icelandic women who reported the experience of physical abuse (excluding mild) reported current moderate or severe suffering, compared with 46% of Estonian women (Table 3). The proportion of women reporting no current suffering from their abuse was highest among women who had reported physical abuse, 4.9% (excluding mild physical abuse) compared with 21.3% for emotional abuse and 28.6% for sexual abuse (Tables 2–4). The median scores ranged from 0 for physical abuse only for Denmark, Estonia and Norway to 4 for emotional and sexual abuse combined for Iceland (see Table S2). On the whole,

Table 1. Baseline characteristics for pregnant women in the Bidens cohort study, 2008–10.

	Belgium *n* = 861		Iceland *n* = 602		Denmark *n* = 1290		Estonia *n* = 975		Norway *n* = 2424		Sweden *n* = 1022		Total *n* = 7174	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%
Age (years)[a]														
<25	149	17.4	91	15.3	41	3.2	238	24.6	286	11.8	112	11.1	917	12.9
25–34	632	73.9	396	66.7	923	72.4	619	63.9	1609	66.5	708	70.0	4887	68.6
≥35	74	8.7	107	18.0	311	24.4	112	11.6	526	21.7	191	18.9	1321	18.5
Education (years attained)[a]														
<9	13	1.5	44	7.4	19	1.5	76	7.9	58	2.4	34	3.4	244	3.5
10–13	322	37.8	142	24.0	119	9.4	324	33.6	618	25.8	307	30.8	1832	25.9
>13	516	60.6	405	68.5	1133	89.1	564	58.5	1723	71.8	655	65.8	4996	70.6
Civil status[b]														
Married/cohabiting	822	97.0	549	93.1	1218	96.0	913	94.4	2314	96.4	971	96.2	6787	95.8
Others	25	3.0	41	6.9	51	4.0	54	5.6	86	3.6	38	3.8	295	4.2
Occupation[a]														
Employed/student	604	71.1	532	89.6	1200	94.1	628	64.8	2208	91.6	926	91.8	6098	85.8
Pregnancy leave	182	21.4	1	0.2	19	1.5	199	20.5	63	2.6	23	2.3	487	6.9
Housewife	19	2.2	17	2.9	10	0.8	83	8.6	68	2.8	10	1.0	207	2.9
Unemployed/social benefits	45	5.3	44	7.4	46	3.6	59	6.1	71	2.9	50	5.0	315	4.4

[a] $p < 0.001$.
[b] $p = 0.001$, Pearson's chi-squared test.

Table 2. Prevalence of emotional abuse and current suffering among pregnant women in the Bidens cohort study, 2008–10.

	Belgium *n* = 861		Iceland *n* = 602		Denmark *n* = 1290		Estonia *n* = 975		Norway *n* = 2424		Sweden *n* = 1022		Total *n* = 7174	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%
Severity of abuse														
Mild[a]														
<18 years	31	3.6	21	3.5	66	5.1	60	6.2	70	2.9	27	2.6	275	3.8
≥18 years	19	2.2	6	1.0	46	3.6	21	2.2	48	2.0	25	2.4	165	2.3
Both	1	0.1	0		17	1.3	12	1.2	14	0.6	10	1.0	54	0.8
Moderate[a]														
<18 years	13	1.5	13	2.2	20	1.6	48	4.9	35	1.4	12	1.2	141	2.0
≥18 years	10	1.2	22	3.7	12	0.9	18	1.9	56	2.3	23	2.3	141	2.0
Both	8	0.9	7	1.2	1	0.1	6	0.6	8	0.3	5	0.5	35	0.5
Severe[a]														
<18 years	25	2.9	16	2.7	36	2.8	55	5.7	90	3.7	28	2.8	250	3.5
≥18 years	28	3.3	10	1.7	49	3.8	43	4.4	92	3.8	22	2.2	244	3.4
Both	4	0.5	3	0.5	5	0.4	6	0.6	23	1.0	14	1.4	55	0.8
Abuse past 12 months[a]	23	2.7	11	1.8	28	2.2	49	5.0	57	2.4	22	2.2	190	2.7
Any lifetime abuse[b]	139	16.2	98	16.3	252	19.6	269	27.7	436	18.0	166	16.3	1360	19.0
Current suffering[c]														
None	29	20.9	11	11.2	42	16.7	80	29.7	100	22.9	28	16.9	290	21.3
Moderate	91	65.5	64	65.3	168	66.7	157	58.4	278	63.8	105	63.3	863	63.5
Severe	13	9.4	23	23.5	38	15.1	26	9.7	50	11.5	30	18.1	180	13.2
Missing	6	4.3	0		4	1.6	6	2.2	8	1.8	3	1.8	27	2.0

[a]NS $p = 0.13$.
[b]$p < 0.001$, Pearson's χ^2-test.
[c]Percentage among women reporting any lifetime abuse.

women reporting having experienced more than one type of abuse also reported a higher median score for suffering compared with women reporting only one type of abuse, while three types of abuse for the majority of the countries had the highest score (see Table S2). The strength of the correlation between severity of each type of abuse and level of suffering was overall moderate (G = 0.2, $p < 0.001$) for emotional abuse and strong for sexual abuse (G = 0.4, $p < 0.001$) and for physical abuse (G = 0.47, $p < 0.001$), although differences existed between countries. For Iceland and Estonia, there was no correlation between degree of suffering and severity of the emotional abuse.

For all the categories of "any abuse" (excluding mild physical abuse), Estonia had the highest prevalence, with 45.4% reporting any lifetime abuse and 6.5% any current abuse (Table 5). Belgium had the lowest prevalence, 23.3% for any lifetime abuse (excluding mild physical abuse) and 3.0% for any abuse during the past 12 months. Adjusted analyses showed that the adjusted odds for Estonian women to report any lifetime emotional and/or physical abuse (excluding mild physical abuse) was significantly higher compared with Norway, OR 1.63 (95% CI 1.36–1.95) and 1.54 (95% CI 1.29–1.84), respectively (Table 6). Belgian and Danish women were significantly less likely to report physical abuse, OR 0.36 (95% CI 0.28–0.46) and 0.60 (95% CI 0.49–0.73) respectively; as well as sexual abuse, OR 0.42 (95% CI 0.32–0.55) and 0.73 (95% CI 0.60–0.90), respectively. Adjustment had no effect on the significance levels and only marginally altered the odds ratios.

Discussion

This is the first European multi-country study on the prevalence of different types of abuse among women attending routine antenatal care. Our data suggest that a history of abuse among pregnant women attending routine antenatal care is common. The prevalence of the different types of abuse varied significantly between the participating countries, with or without adjusting for age, education and gestational length at time of participation. The prevalence of current abuse was low. About one in 10 women reported severe suffering from the experienced abuse.

In our study, women were asked if they had experienced the reported abuse during the past 12 months. Women were on average mid-way through their pregnancy when they filled out the questionnaire. As a result, we do not report abuse that happened only during

Table 3. Prevalence of physical abuse and current suffering among pregnant women in the Bidens cohort study, 2008–10.

	Belgium *n* = 861		Iceland *n* = 602		Denmark *n* = 1290		Estonia *n* = 975		Norway *n* = 2424		Sweden *n* = 1022		Total *n* = 7174	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%
Severity of abuse														
Mild[a]														
<18 years	105	12.2	46	7.6	315	24.4	93	9.5	440	18.1	115	11.3	1114	15.3
≥18 years	12	1.4	21	3.5	82	6.4	56	5.7	98	4.0	43	4.2	312	4.4
Both	6	0.7	6	1.0	39	3.0	6	0.6	59	2.4	18	1.8	134	1.9
Moderate[a]														
<18 years	23	2.7	54	9.0	46	3.6	108	11.1	152	6.3	40	3.9	423	5.9
≥18 years	15	1.7	27	4.5	36	2.8	56	5.7	129	5.3	33	3.2	296	4.1
Both	6	0.7	10	1.7	2	0.2	16	1.6	21	0.9	12	1.2	67	0.9
Severe[a]														
<18 years	15	1.8	9	1.5	19	1.5	49	5.1	66	2.7	15	1.5	173	2.4
≥18 years	24	2.8	16	2.7	59	4.6	66	6.8	137	5.7	39	3.8	341	4.8
Both	0		0		1	0.1	5	0.5	15	0.6	7	0.7	28	0.4
Abuse past 12 months[a]	11	1.3	13	2.2	32	2.5	27	2.8	55	2.3	18	1.8	156	2.2
Any lifetime abuse[a]	206	24.0	189	31.4	599	46.5	455	46.7	1117	46.1	322	31.5	2888	40.3
Current suffering[a,b]														
None	106	51.5	73	38.6	342	57.1	266	58.5	697	67.4	151	46.9	1635	55.6
Moderate	71	34.5	87	46.0	178	29.7	167	36.7	323	28.9	135	41.9	961	33.3
Severe	4	1.9	21	11.1	16	2.7	13	2.9	23	2.1	24	7.5	101	3.5
Missing	25	12.1	8	4.2	63	10.5	9	2.0	74	6.6	12	3.7	191	6.6
Physical abuse, mild physical abuse excluded														
Any lifetime abuse[a]	83	9.7	116	19.3	163	12.6	300	30.8	520	21.5	146	14.3	1328	18.5
Current suffering[a,b] ~~(%)~~														
None	26	31.3	34	29.3	66	40.5	158	52.7	264	50.8	48	32.9	596	44.9
Moderate	53	63.9	63	54.3	83	50.9	127	42.3	225	43.3	75	51.4	626	47.1
Severe	4	4.8	18	15.5	13	8.0	12	4.0	21	4.0	21	14.4	89	6.7
Missing	0		1	0.9	1	0.6	3	1.0	10	1.9	2	1.4	17	1.3

[a]$p < 0.001$, Pearson's chi-squared test.
[b]Percentage among women reporting any lifetime abuse.

pregnancy but current abuse. The prevalence of recent abuse in our study is consistent with 12-month estimates from other European settings when measured during pregnancy, such as in Norway (5%) (22), England (1–5%) (23), Belgium (3.0–3.9%) (24), Sweden (2.8%) (25) and Denmark (2.8% during pregnancy) (~~21~~). A number of studies report the prevalence of abuse in high-income settings separately for the year before pregnancy and during pregnancy, so complicating comparison to our findings (11,~~21,~~24). On the whole, the reported prevalence of abuse is higher the year before pregnancy than during pregnancy (7,11,18,24,~~26~~). This is consistent with the protective effect some research claims that pregnancy can have, while other studies have noted an increase, in particular, of emotional and sexual abuse during pregnancy and of the severity and frequency of the abuse (11). Our study did not investigate these aspects of abuse. Alternatively, it may be only the reporting of the abuse which is reduced and not the occurrence.

Our study suggests that in general fewer women suffered from physical abuse and more from emotional abuse, which is consistent with other reports (7). However, it should be noted that 61.5% of those experiencing lifetime emotional abuse ($n = 1360$) were experiencing at least one other kind of abuse as well. Also consistent with other studies we observed that suffering was less when women had reported the experience of only one type of abuse, compared with women reporting two or three types of abuse. In addition, our results showed that the severity of the abuse on the whole corresponded with the degree of current suffering. This suggests a general agreement between researchers and abused women that multiple kinds and severity of abuse are associated with the most suffering. There were differences between countries, which could be due to cultural and contextual differences (~~27~~). It may be that in a society with a higher tolerance for violence, the victims tend to regard their experiences as less offensive.

Further, not all pregnant women with a history of abuse report that they suffer from the abuse, or at least not to a great extent. It may be that these women have recovered with or without the help of others, experienced

Table 4. Prevalence of sexual abuse and current suffering among pregnant women in the Bidens cohort study, 2008–10.

	Belgium *n* = 861		Iceland *n* = 602		Denmark *n* = 1290		Estonia *n* = 975		Norway *n* = 2424		Sweden *n* = 1022		Total *n* = 7174	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%
Severity of abuse														
Mild[a]														
<18 years	10	1.2	17	2.8	38	2.9	19	2.0	58	2.4	20	2.0	162	2.3
≥18 years	1	0.1	4	0.7	25	1.9	9	0.9	27	1.1	15	1.5	81	1.1
Both	1	0.1	2	0.3	2	0.2	1	0.1	3	0.1	0		9	0.1
Moderate[b]														
<18 years	21	2.4	32	5.3	33	2.6	56	5.7	111	4.6	35	3.4	288	4.0
≥18 years	2	0.2	4	0.7	11	0.9	9	0.9	27	1.1	12	1.2	65	0.9
Both	0		1	0.2	1	0.1	1	0.1	3	0.1	2	0.2	8	0.1
Severe[c]														
<18 years	23	2.7	39	6.5	25	1.9	43	4.4	89	3.7	31	3.0	250	3.5
≥18 years	13	1.5	21	3.5	29	2.2	35	3.6	94	3.9	37	3.6	229	3.2
Both	0		7	1.2	4	0.3	2	0.2	18	0.7	5	0.5	36	0.5
Abuse past 12 months[d]	0		3	0.5	3	0.2	8	0.8	12	0.5	3	0.3	29	0.4
Any lifetime abuse[c]	71	8.3	127	21.1	168	13.0	175	18.0	430	17.7	157	15.5	1129	15.7
Current suffering[e,f] ~~(%)~~														
None	14	19.6	22	17.3	52	31.0	58	33.1	135	31.4	42	26.6	323	28.6
Moderate	48	67.6	80	63.0	98	58.3	99	56.6	249	57.9	87	55.1	661	58.5
Severe	3	4.2	19	15.0	14	8.3	13	7.4	36	8.4	22	13.9	107	9.5
Missing	6	8.5	6	4.7	4	2.4	5	2.9	10	2.3	7	4.4	38	3.4

[a]$p = 0.01$.
[b]$p = 0.001$.
[c]$p < 0.001$.
[d]NS = 0.40.
[e]$p = 0.01$, Pearson's chi-squared test.
[f]Percentage among women reporting any lifetime abuse.

Table 5. Prevalence of any childhood, adult, lifetime and current abuse among pregnant women in the Bidens cohort study,[a] 2008–10.

	Belgium *n* = 861		Iceland *n* = 602		Denmark *n* = 1290		Estonia *n* = 975		Norway *n* = 2424		Sweden *n* = 1022		Total *n* = 7174	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%
Any childhood abuse[b]	139	16.1	171	28.4	255	19.8	337	34.6	583	24.1	208	20.4	1693	23.6
Any adult abuse[b]	100	11.6	99	16.4	259	20.1	217	22.3	541	22.3	197	19.3	1413	19.7
Any lifetime abuse[b]	200	23.2	214	35.5	433	33.6	443	45.4	900	37.1	309	30.2	2499	34.8
Any abuse past 12 months[b]	26	3.0	20	3.3	42	3.3	63	6.5	89	3.7	31	3.0	271	3.8

[a]Women with only mild physical abuse were excluded from these analyses.
[b]$p < 0.001$, Pearson's chi-squared test.

only a single event or a very mild form of abuse only, or had more resilience. However, we cannot exclude that as a coping mechanism women with abusive experiences might repress their feeling of suffering.

The prevalence of lifetime experience of abuse among pregnant women is relevant for two reasons. First, the past experience may have physical and psychological consequences for the current pregnancy (6). Second, women who report previous abuse may be at an increased risk of abuse during pregnancy (11). The lifetime prevalence of any abuse of 23–45% found in our study is consistent with those reported among pregnant women in other European studies, such as 32% in Norway (22), 23.5% in England (23), 34.5% in Denmark (~~21~~), 19.4% in Sweden (25), 27.6% in Belgium (24). The lifetime prevalence in our study is expected to be lower compared with studies including women of all ages as older women have had more time in which to accumulate abuse. In our study,

Table 6. ~~Crude and adjusted~~[a] odds ratio (OR) (95% CI) of emotional, physical and sexual lifetime abuse, among pregnant women in the Bidens cohort study, 2008–10.

Country	Emotional abuse Adjusted OR	Physical abuse Adjusted OR	Physical abuse, excluding mild physical abuse Adjusted OR	Sexual abuse Adjusted OR
Norway	1	1	1	1
Belgium	0.87 (0.71–1.08)	0.36 (0.30–0.43)	0.36 (0.28–0.46)	0.42 (0.32–0.55)
Iceland	0.84 (0.66–1.08)	0.51 (0.42–0.62)	0.83 (0.65–1.05)	1.16 (0.92–1.47)
Denmark	1.19 (1.00–1.43)	1.07 (0.93–1.23)	0.60 (0.49–0.73)	0.73 (0.60–0.90)
Estonia	1.63 (1.36–1.95)	0.99 (0.85–1.16)	1.54 (1.29–1.84)	0.99 (0.81–1.22)
Sweden	0.84 (0.68–1.03)	0.52 (0.44–0.61)	0.55 (0.44–0.68)	0.81 (0.65–0.99)

[a]Adjusted for age, education and gestational week for filling out the questionnaire.

Estonia had the highest prevalence of any abuse and Belgium the lowest. This could be due to social and cultural differences in what are considered abusive behaviors, which become apparent when abuse is defined by descriptive questions.

Women were recruited while attending routine antenatal care, aiming at an unselected population that would be representative for pregnant women in these countries. Although the varying response rate for the participating countries causes concern it is likely that differences in recruitment method played a role. In some of the places women and staff may be frequently asked to participate in research, which may reduce their willingness to contribute. The average age of women in the country samples of our study compared well with the average age of pregnant women in the participating countries. Participants in our study had a higher level of education than the pregnant population in their respective countries: 59–72% had more than 13 years of education, compared with national averages of 39–65%. In all participating countries, except for Iceland and Norway, the proportion of nulliparous women was slightly higher among participants (45–54%) than the country average (43–47%). In Belgium the sample was entirely Flemish. In Estonia the proportions of Estonian-speaking women (80%) and Russian-speaking women (20%) participating in the study are similar to the national proportions of the country.

We used an instrument previously used in a multi-country study (19) but so far only validated in a Swedish population (20,~~28~~). In spite of quality translation into the various languages, the validity may have varied and so influence the estimates. Using descriptive questions, however, is a strength because it allows the researchers to define the abuse and not the participants. Our study was based on self-reported abuse. The results may have been different if personal interviews had been conducted. However, previous studies have found disclosure of sensitive topics to be higher in self-administered modes compared with face-to-face (~~29~~).

Obstetricians and midwives meeting women in routine antenatal care should be aware that a high proportion of the women they meet have a history of abuse. Some countries have implemented routine screening to identify current victims of intimate partner violence in antenatal care. It appears that not only is current ongoing abuse of concern but also women with current suffering from earlier abuse could benefit from being identified and receiving specialized care.

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Supporting information

Additional Supporting Information may be found in the online version of this article:

Table S1. Description of the study sites, Bidens cohort study, 2008–2010 (N = 7174).
Table S2. Suffering among women who have experienced abuse, median and interquartile range, Bidens cohort study, 2008–2010 (N = 7174).

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