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Review Paper

Physical, mental and social consequences in civilians who have experienced war-related sexual violence: a systematic review (1981–2014)

I. Ba^{a,*}, R.S. Bhopal^b^a Independent Researcher, Burkina Faso^b Edinburgh Migration, Ethnicity and Health Research Group (EMEHRG), Centre for Population Health Sciences, Institute of Population Health Sciences and Informatics, University of Edinburgh, Edinburgh, UK

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ABSTRACT

Objectives: To identify the health outcomes of sexual violence on civilians in conflict zones between 1981 and 2014.

Study design: Systematic review.

Methods: For the purpose of this study, we defined sexual violence as sexual torture including, individual rape, gang rape, and sexual slavery. All types of conflicts were included (intrastate, interstate, and internationalized intrastate). Quantitative and mixed-method studies, reporting any physical, mental, and social consequences, were retrieved from Medline, Embase, Global Health, Global Health Library, WHOLIS, Popline, and Web of Sciences ($n = 3075$) and from checking reference lists and personal communications ($n = 359$). Data were analyzed using Microsoft Excel and MetaXL. Given inherent variation, the means derived from combining studies were misleading; thus, we focused on the range of values.

Results: The 20 studies were from six countries, five in Africa (18 studies), and especially in Democratic Republic of Congo (12 studies). The number of subjects varied from 63 to 20,517, with 17 studies including more than 100 subjects. Eight studies included males. Gang rape, rape, and abduction were the most commonly reported types of sexual violence. Sixteen studies provided data on physical outcomes of which the most common were pregnancy (range 3.4–46.3%), traumatic genital injuries/tears (range 2.1–28.7%), rectal and vaginal fistulae (range 9.0–40.7%), sexual problems/dysfunction (range 20.1–56.7%), and sexually transmitted diseases (range 4.6–83.6%). Mental health outcomes were reported in 14 studies, the most frequent being post-traumatic stress disorder (range 3.1–75.9%), anxiety (range 6.9–75%), and depression (range 8.8–76.5%). Eleven studies provided social outcomes, the most common being rejection by family and/or community (range of 3.5–28.5%) and spousal abandonment (range 6.1–64.7%).

* Corresponding author. Permanent address: BP 2903, Bobo Dioulasso, Burkina Faso.

E-mail address: iness.ba@gmail.com (I. Ba).

¹ Present address: CHAI Swaziland Office, PO BOX 6080, H100 Mbabane, Swaziland.

² Currently at Clinton Health Access Initiative, USA. This research was carried out independently and is not related to this affiliation.

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Conclusions: Wartime sexual violence is highly traumatic, causing multiple, long-term negative outcomes. The number and quality of studies published does not match the significance of the problem. The findings highlight the need for care of the survivors and their relatives and raise concerns about how they and their children will be affected in the long term.

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Introduction

Since the end of World War II, 254 armed conflicts have been recorded in 155 locations.¹ For civil wars alone, between 1980 and 2009, 86 civil wars were recorded with 18 conflicts coded as wars with widespread rape and 35 as having many or numerous reports of rape.² Sexual violence against civilians has long been part of armed conflict with great variation as to its scale, its characteristics, the targets and whether the violence was strategically planned.

Sexual violence as a weapon of war is a widely used term, especially in advocacy, that describes a systematic pattern of sexual torture perpetrated by combatants against civilians. Studies showed that sexual violence used as a weapon of war is known to be different from the one committed as an isolated act of aggression in terms of severity of the violence, number of perpetrators, number of assaults and its strategic use to terrorize and induce fear and control civilian populations.^{3,4}

Sexual violence can be prosecuted as torture, a war crime and a crime against humanity.⁵ However, despite the adoption of United Nations Resolution 1820⁶ calling for the cessation of sexual violence against civilians in conflict zones, hundreds of victims suffer from wars fought ‘on their body’.⁷ In ongoing conflicts, this weapon of war continues to ‘terrorize communities’.³ Documents reporting on women kept as sex slaves in camps, raped and forbidden to undergo abortion or of fathers forced at gunpoint to rape their daughters are numerous.^{3,8,9}

Establishing the rate of war-related sexual violence is challenging because of insecurity, taboos surrounding sexual violence and the complexities of population-based surveys on this topic. Sexual violence has been reported by 11% of displaced women in Colombia, 19% of women in Burundi, 25% of women in Azerbaijan and 39% of women during the Rwandan genocide.^{10,11} In Sierra Leone, 9% of women reported sexual violence,¹² while in Liberia and Cote d’Ivoire, this rate was 35.3% and 0.2%, respectively.¹³ In eastern DRC (Democratic Republic of Congo), two surveys estimated the prevalence of the experience of sexual violence to be 16–40% in women and 24% in men.^{14,15} Missing from these figures are the cases that remain unreported due to death of the victims, stigmatization, the vulnerability of victims and general insecurity.^{16–18} Non-reporting of sexual violence at the time of seeking medical care is as high as 75% and may be higher in conflict settings.¹⁴ In DRC, only 1 in 30 victims officially report sexual violence and more than 50% of victims are unable to access health care.¹⁹ Young women, for instance, are ‘more inclined to

isolate themselves or relocate after their rape’,²⁰ while male survivors have less tendency to seek health care.^{21–24}

Systematic reviews have been published on prevalence of sexual violence in crisis,^{25,26} on prevention^{27,28} and on management strategies,^{29–31} but to our knowledge, no systematic review on the range of consequences of sexual violence in conflict settings has been published. One review considered the prevalence of sexual violence in conflicts in Africa and its effect on human immunodeficiency virus (HIV) incidence¹³ and another non-systematic review on fistula.³² This systematic review sought to identify the health consequences of sexual violence on civilians in conflict zones since 1981.

Methods

Search strategy and selection criteria

A protocol was developed using the PRISMA guidelines (see [Table S1](#) in the Supplementary material).³³ For the purposes of this study, we utilized the description of war-based sexual violence of Lunde and Ortmann³⁴ including one or more of: (a) violence against the sexual organs, i.e., introduction of objects in the vagina, shooting on the genital parts and various genital mutilation; (b) physical sexual assault, i.e., sexual acts involving direct physical contact between victims and torturer, between victim and victim, between victim and animal, or all of the above; and (c) mental sexual assault, i.e., forced nakedness, sexual humiliations, sexual threats and the witnessing of others being sexually tortured.

We sought data for conflicts that took place from 1981 onwards. This decision was pragmatic although it was influenced by the knowledge that this marked the beginning of the era of HIV/AIDS in modern times.³⁵ The time of the conflict was based on the Uppsala Conflict Data Program.³⁶ Studies that used quantitative methods or mixed methods and included a methods section were eligible. The subjects had to be victims/survivors of war-related sexual violence. No exclusion was made by gender, age, or other socio-demographic characteristics. All types of conflicts were included (intrastate, interstate, and internationalized intrastate). The perpetrators could be armed combatants, ex-combatants, or civilians if the sexual violence was war related. If the sexual violence was not explicitly categorized as war related, only those studies where civilians represented less than 25% of the perpetrators were included. This cutoff was used to prevent the inclusion of non-war-related

sexual violence. To reduce the methodological problems related to very small sample size, studies involving less than 50 survivors were excluded. Furthermore, studies on sexual violence on asylum seekers and former combatants, including child soldiers, were excluded from this study which focused on civilians in their country of residence. Studies reporting any physical, mental, and social consequences were included.

This study included electronic sources, print sources, and other sources including grey literature. References in reviews and key studies were examined to identify potentially relevant studies. We made contact with experts/organizations in the field. The search was not restricted by language, country, or date. Only studies in the languages read by IB (English, French, and Spanish) were included. The software EndNote was used to organize the search results.

The search examined: Medline, Embase, Global Health, The Global Health Library, WHOLIS, Popline, and Web of Science. The grey literature was searched using Google. Both controlled index and free-text search were used. The search comprised terms linked to sexual violence ('sexual assault', 'sexual violence', 'rape', etc.) separated by the Boolean operator 'OR'. They were combined by the Boolean operator 'AND' to search terms linked to conflict ('war', 'conflict', 'warfare', etc.) also separated by Boolean operator 'OR'. To increase sensitivity, the search was not restricted to any particular outcomes or countries. [Table S2 in the Supplementary Material](#) shows the search strategy for the searched databases.

Selection of the studies, quality assessment and data extraction and analysis

The search was done by IB with assistance from a librarian. Eligibility of all the references was assessed by IB. RSB independently checked all the references found by Medline. Disagreements were resolved by discussion. As there were no changes to the selection, RSB did not check the results of other databases. Data were extracted by IB using a standard extraction form. Data were entered into a Microsoft Excel[®] spreadsheet and summarized in tables. RSB cross-checked the data in the main tables using the original papers. Changes were agreed by both authors.

The software MetaXL³⁷ was used to summarize the data and calculate confidence intervals. Except for the separate examination of males and females, no subgroup analyses were conducted. To assess the variation in study outcomes between studies, the I^2 statistic was used. A value between 75% and 100% was regarded as considerable heterogeneity. As there was substantial heterogeneity among studies and few used population samples, the pooled estimates (and confidence intervals) calculated were deemed to be misleading. Thus, the emphasis was put on the range of values.

Since the review includes quantitative studies with different designs and mixed-method studies, the mixed-method appraisal tool (MMAT) was used by IB to assess the quality of the included studies.³⁸ Scores varied from one criterion met (1/4) to all criteria met (4/4). If the information for a criterion was unclear, it was considered as unmet.

Box 1 Inclusion and exclusion criteria

Inclusion criteria:

- Quantitative or mixed-method design
- Includes a method section
- Subjects are victims of war-related sexual violence
- Conflict took place after 1981

Exclusion criteria:

- More than 25% of the perpetrators are civilians, when the sexual violence is not categorized as predominantly war related
- Sample size less than 50 subjects
- Sample includes asylum seekers and/or former combatants

Results

Results of the search

The inclusion and exclusion criteria are in the [Box 1](#). From the seven databases searched, 23 studies potentially met the inclusion criteria. Reference lists of these 23 papers and 22 review articles yielded eight more articles. Out of these 31 studies, 12 did not provide data on prevalence of outcomes. The authors of 10 of these papers provided information on request, and one additional paper was included. Two unsuccessful attempts were made to contact the other two authors. The search therefore identified 20 eligible studies.^{12,14,17,18,20,21,39–52} No additional data were retrieved from any of the 20 studies included in the present review. The search results are summarized in [Fig. 1](#).

Quality assessment criteria: score out of four

Four studies met four criteria, five studies met three criteria, four studies met two criteria, and seven met only one criterion ([Table S3](#)). The main shortcomings were selection bias and lack of representativeness partly due to convenience sampling. Other limitations included recall bias.

Setting, subjects' characteristics and methodology of included studies

As shown in [Table 1](#), where each study is given a number for cross-reference to text, most studies were in Africa ($n = 18$) and especially in DRC ($n = 12$). Only two studies were in Europe (Croatia). The fieldwork took place between 1992 and 2012. Mostly, the studies were published shortly after the fieldwork, but those in Croatia were published more than 10 years later (studies 19 and 20). Most studies were cross-sectional surveys ($n = 8$) or case series ($n = 9$). Eleven studies were facility-based and six used patient data files (clinic records or service records of non-governmental organizations). The number of subjects varied from 53 to 20,517, with three studies including 50–100 subjects.

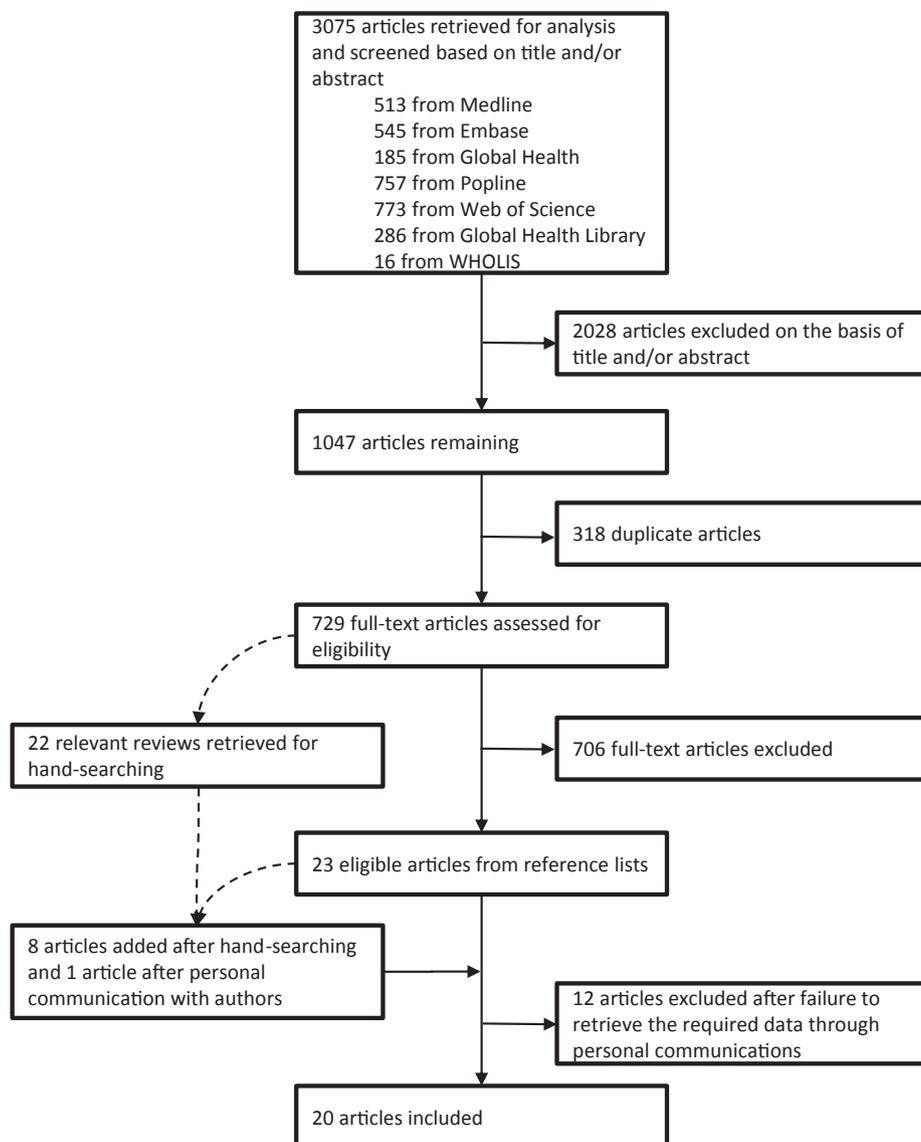


Fig. 1 – Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) diagram showing the selection process.

The age range of subjects was extremely wide. One study in Sierra Leone (study 16) included subjects aged between 1 and 95 years, while others in DRC (study 5) and Croatia (study 19) included subjects aged 3.5–80 and 14–83 years, respectively. In total, out of 16 studies that provided information on the age of the participants, 11 included children (defined as less than 18 years old). Most subjects were farmers, traders, fisherman, or unemployed/staying at home. Most subjects were married and had only received primary school education or no education. Only eight studies included males, and four of these provided information on the consequences. Two studies (study 6 and study 14) revealed that 23.6% and 7.4% of men had experienced sexual violence, respectively. The female-to-male ratio varied from between 2:1 and 66:1. Some studies provided definitions of sexual violence close to the one used for this study, while others only included rape (study 4) or sexual violence committed by soldiers (studies 12 and 13).

Seven studies did not provide any case definition of sexual violence.

Type of sexual violence experienced by the subjects

Most of the perpetrators were combatants (range 48–100%). The percentage of unknown attackers (information not available or attacker that could not be identified) and civilian perpetrators ranged from 0% to 69% and 0% to 23%, respectively. Many different armed groups perpetrated sexual violence, with both male and female perpetrators (studies 6 and 14).

Table 2 shows the proportion of study subjects experiencing various kinds of sexual violence. Some studies did not report on the items in this table (studies 3, 9, 10, 11, 14) and hence are omitted. A few of the studies (studies 1, 2, 5, 8, 12, 13, 16) reported the number of assailants. The average in these studies was 2 or 3, but the range was 1–25 (study 16). Females

Table 1 – Characteristics of included studies.

Continent, country, study no.	Authors, year of publication, fieldwork setting and date	Definition of sexual violence applied (stated or implied)	Study design	Methods of sampling/ source of information	Number of subjects (total and by sex)	Mean or median ^a and/or range of age
Africa						
Democratic Republic of Congo (DRC)						
1	RFDA et al., 2005, ¹⁷ South Kivu, 15 Sep–15 Dec 2003	Rape and other types of sexual abuse committed during the armed conflict.	Cross-sectional survey and focus groups	Combination of snowball and systematic sampling	492; F = 492	32 [12–70]
2	MSF 2007, ⁴⁷ Ituri province, May 2003–Jul 2007	Any acts of sexual nature which is committed on a person under circumstances which are coercitive.	Retrospective cohort	Patients notes	2695; F = 2462 ^b and M = 103 ^b	25.7 ^b [1 to >50] ^b
3	Mukwege and Nangini 2009, ⁴⁰ Panzi Hospital, South Kivu, 1999–Aug 2006	Rape with extreme violence (gang rape, genital mutilation, intentional transmission of disease)	Case series	Patients notes	7519; F = 7519	n.a
4	Steiner et al., 2009, ⁴⁸ South Kivu, Jan 2005–Dec 2007	Rape survivors	Case series	Patients notes	20,517; F = 20517	n.a [11–70]
5	Bartels et al., 2010, ³⁹ Panzi Hospital, South Kivu, Nov 2007–Mar 2008	Sexual violence is any unwanted physical contact of a sexual nature.	Case series	Interviews with non-systematic convenience sample of hospital patients	1021; F = 1021	36 [3.5 to 80]
6	Johnson et al., 2010, ¹⁴ North and South Kivu Province and Ituri district, Mar 2010	Sexual violence is any physical or psychological violence carried out through sexual means or by targeting sexuality.	Cross-sectional	Multistage cluster random—systematic strategy	998; F = 593 and M = 405	40.1 [18 years plus]
7	Baelani and Dunser 2011, ⁵² Goma (DOCS Hospital), Jan 2009–Oct 2010	Systematic rape and sexual brutality, including gang rape	Case series	Patients notes and administrative register	1343; F = n.a and M = n.a	n.a
8	Kelly et al., 2011, ¹⁸ Eastern DRC, Jul–Aug 2007	Sexual violence is being forced to have sex with someone or perform a sexual act against your will.	Interviews with a series of cases	Convenience sample of attendees, at hospital and NGOs	255; F = 255	36.1 [18–76]
9	Schalinski et al., 2011, ⁴² Eastern DRC, Jan–Mar 2009	Organized sexual violence	Case series	Interviews with a random list of hospital patients	53; F = 53	30 [14–56]
10	Kohli et al., 2012, ⁵⁰ Walungu territory, Jul 2010–Jun 2011	Sexual violence in an area known for brutal acts	Case series	Report based on standardized clinic forms	657; F = 657	1%–<20 years, 39%–20 to 40 years, 60%–>40 years
11	Mankuta et al., 2012, ⁴⁹ remote area of Eastern Congo, Aug 2008	Sexual violence in an area where this is characterized by brutality	Case series	Service users, medical staff and medical records	440; F = 440	n.a
12	Dossa et al., 2014, ²⁰ Goma, Jul–Aug 2012	Being raped or having experienced other forms of forced sexual acts, after 1996 by armed men in areas where armed combat took place.	Cross-sectional	Snowball	320; F = 320 and M = 0	27.7 [15 – 45]

(continued on next page)

Table 1 – (continued)

Continent, country, study no.	Authors, year of publication, fieldwork setting and date	Definition of sexual violence applied (stated or implied)	Study design	Methods of sampling/ source of information	Number of subjects (total and by sex)	Mean or median ^a and/or range of age
Congo 13	Hustache et al., 2009, ⁵¹ Brazzaville, Jan 2002–April 2003 (follow-up June/July 2004)	Rape by unknown person(s) wearing military clothes.	Cohort of cases	Interviews of patients at follow-up in community	178 (70 with follow-up) F = 178	26 ^a [15 years plus]
Liberia 14	Johnson et al., 2008, ⁴¹ 40 clusters across 15 counties, May 2008	Sexual violence is any violence, physical or psychological, carried out through sexual means or by targeting sexuality.	Cross-sectional, population-based, multistage random cluster survey	Combination of systematic and cluster sampling	1666; F = 880 and M = 786	41.3 [18 years plus]
15	Kinyanda et al., 2010b, ⁴³ four counties across Liberia, n.a	War-related sexual violence—including single episode rape, gang rape, sexual comforting and abduction with sex.	Cross-sectional community-based survey	Multistage cluster	643; F = 515 and M = 128	All ages with 77% above 25 years
Sierra Leone 16	Amowitz et al., 2002, ¹² three camps and one town, 4 weeks in 2001	Sexual violence included rape and other forms of sexual assault.	Cross-sectional survey	Systematic and cluster sample interviewed	991 women reported on 9166 household members F = 5001 and M = 3983	24.8 [1–95]
Uganda 17	Kinyanda et al., 2010a, ⁴⁴ Northern Uganda, 2005	War-related sexual violence including single episode rape, gang rape, homosexual rape, sexual comforting and abduction with sex.	Cross-sectional/survey of those seeking services and screened (57,444 in camps)	Interview of camp residents	813; F = 573 and M = 240	89% were 24 years or more
18	Kinyanda et al., 2012, ⁴⁵ Eastern Uganda, n.a	No definition stated but war with physical and sexual torture seen as a causal factor in risky sexual behaviour	Cross-sectional	Interview. Multistage with cluster sampling of villages and random sampling of individuals	1560; F = 887 and M = 673	n.a [15 years plus]
Europe Croatia 19	Loncar et al., 2006, ⁴⁶ Zagreb, Apr 1992–Dec 1995	Study of systematic mass war time rape	Case series of those seeking care	Interviews of those seeking help	68; F = 68	32 [14–83]
20	Loncar et al., 2010, ²¹ Zagreb, 1995–1998	Sexual torture: rape, performing different sexual acts under threat, injuries	Case series of those seeking care	Interviews of those seeking help	60; M = 60	n.a

F, female; M, male; n.a, not available.
^a Median.
^b Characteristics provided only for 2565 subjects, in Duroch et al. study (2011).

Table 2 – War-related sexual violence experienced by subjects by sex and country.

Study no.	Authors, year	Number of subjects per sex	Mean and range of attackers	Rape (homosexual rape, heterosexual rape)	Gang rape	Forced to perform act with another civilian	Sexual slavery	Abduction	Forced marriage	Molestation ^a	Severe beating of/mutilation of person's genitals	Forced to undress/ stripped of clothing	Attempted rape
Females													
Africa													
Democratic Republic of Congo													
1	RFDA et al., 2005 ¹⁷	F = 492	3.0 [1–20]	21	79						12		
2	MSF 2007 ⁴⁷	F = 2462	n.a [1 to >9]	26	74			17					
4	Steiner et al., 2009 ⁴⁸	F = 20517	n.a	100	n.a								
5	Bartels et al., 2010 ^{b,39}	F = 1021	2.5 [1 to >15]	21	59		17						
6	Johnson et al., 2010 ¹⁴	F = 202	n.a	19	33	1	23	5	3	30		29 ^c	
8	Kelly et al., 2011 ¹⁸	F = 193	2.8 [1–10]	23	69			46					
12	Dossa et al., 2014 ²⁰	F = 67	n.a [1 to >3]	34	66			13					
Congo													
13	Hustache et al., 2009 ⁵¹	F = 178	2	100	n.a								
Liberia													
15	Kinyanda et al., 2010b ⁴³	F = 448	n.a	16	12			7	15				17
Sierra Leone													
16	Amowitz et al., 2002 ¹²	F = 94	3.2 [1–25]	89	33		15	33	10	14	4	37	
Uganda													
17	Kinyanda et al., 2010a ⁴⁴	F = 164	n.a	15	3	6 ^e		27	15				17
Europe													
Croatia													
19	Loncar et al., 2006 ⁴⁶	F = 68	n.a	100			31 ^f	37 ^g					
Males													
Africa													
Democratic Republic of Congo													
2	MSF 2007 ⁴⁷	M = 103	n.a	11	89			65					
6	Johnson et al., 2010 ¹⁴	M = 88	n.a	14	7	7	23	25	0	16		19 ^c	
Uganda													
17	Kinyanda et al., 2010a ⁴⁴	M = 16	n.a	63	0	25 ^e		25	25				13
Europe													
Croatia													
20	Loncar et al., 2010 ²¹	M = 60	n.a	3		25 ^d		78			68		

F, female; M, male; n.a, not available.

Numbers are percentages unless otherwise stated.

^a Molestation: the action of sexually harassing someone in an aggressive or persistent manner.

^b Additionally, 2.7% of the subjects reported being forced to perform act with another civilian, insertion of foreign objects into the genitals and/or being forced to undress.

^c Percentage of subjects stripped of clothing, 29% of females and 17% of males also reported being forced to undress.

^d Percentage of subjects forced to place objects in person's rectum, 22% also reported being forced of performing fellatio, 3% rape and 5% other forced sexual actions.

^e Forced incest.

^f Sexual slavery is equated to being raped every day.

^g Percentage of subjects that reported being raped in a Serbian war camp or a brothel camp.

mainly experienced gang rape [3–89%], rape [15–100%], abduction [5–46%], and sexual slavery [13–31%]. Males mainly experienced rape [3–63%], abduction [25–78%], and gang rape [0–89%]. Survivors often experienced torture before, during or after sexual violence. For instance, in DRC (study 3), 72% of the subjects were beaten, wounded with machetes, or burned, while 12.4% had objects (sticks, rifle barrels, etc.) inserted into their vaginas. Two studies reported the death of the victims (study 3 and 20). Some females were killed by shots fired into their vaginas, while some males did not survive their castration. However, no estimates on deaths as an outcome were provided.

Only a few studies provided information on care-seeking behaviours and health care access (studies 1, 4, 7, 8, 10, 13, 14, 16), all of them highlighting limited access and poor seeking behaviour. For instance, in study 10, 45% of the participants reported not receiving care after their sexual assault, while in study 8, 45% of the participants waited a year or more before seeking health care, 55% lived more than 1-day walking distance from a facility providing sexual and gender-based violence services and more than 95% could not access prophylactic care in time. Furthermore, studies 7 and 16 reported variable quality of care, limited services for victims of sexual violence, and shortage of human and material resources to provide adequate care.

The included studies provided prevalence rates for multiple physical, mental and social consequences of sexual violence. The outcomes that are tabulated in this manuscript were judged as being the most important, most closely related outcomes to the phenomenon of war-related sexual violence. The list of other outcomes reported by the included studies can be found in the [Supplementary Material \(Tables S4, S5, S6\)](#).

Physical consequences of sexual violence

[Table 3](#) summarizes 16 studies and shows that the most commonly reported consequences included pregnancy [11 studies, range: 3–46%], traumatic genital injuries/tears [7 studies, range: 2–29%], fistulae [6 studies, range: 9–41%], and sexual problems/dysfunction [6 studies, range: 20–57%]. In addition, one study in DRC (study 12) and one in Croatia (study 19) provided the prevalence of abortion as 3% and 59%, respectively.

Mental and social consequences of sexual violence

[Table 4](#) summarizes 17 studies and shows the main mental health disorders and social consequences experienced by the survivors. Mental health was sometimes evaluated using well-recognized tools and definitions, and mental health outcomes were often not clinically diagnosed. The most reported mental health outcome was post-traumatic stress disorder (PTSD) [11 studies, range: 3–95%], followed by anxiety [9 studies, range: 7–75%] and depression [8 studies, range: 9–76%]. The table also highlights the serious social consequences of sexual violence on the victims. High prevalence of stigmatization by family and/or community was reported, with rates as high as 29% (study 8).

Observations on differences between men and women

There were differences between male and female survivors. In study 6, the prevalence in females and males for traumatic genital injury was 29% and 13%, respectively. The prevalence of sexually transmitted diseases (STDs) in females (17%) and males (5%) also differed. In both study 6 and 14, females had higher rates of PTSD and depression, but males had higher prevalence of anxiety than females. Male survivors were more likely than women to abuse alcohol and other substances in study 6, with rates of 50% and 18%, respectively. However, this result was not replicated in study 14.

Range of outcomes and prevalence rates

[Table 5](#) presents a summary of 17 outcomes of sexual violence and shows wide ranges in prevalence of physical, mental and social outcomes. The commonest outcomes included PTSD (56%), depression (49%), social dysfunction (39%) and sexual dysfunction (35%). However, [Table 5](#) underlines the heterogeneity between the studies and the difficulty in interpreting pooled estimates. Due to the inappropriateness of conducting a meta-analysis, only the median, quartiles and minimum and maximum values are presented in the table and means have been removed.

Discussion

Overview of findings

This is the first systematic review on the health consequences of sexual violence on civilians in all conflict settings. We found little data, with research mainly in Africa. Only six countries are included in this review, while there were 18 wars with widespread rape and many other conflicts reporting rape in the time period.² The 20 studies had shortcomings, and comparisons across studies were hindered by heterogeneity in study design, subjects, definitions, and measurements. Nonetheless, they demonstrate the brutality and extent of wartime sexual violence and its consequences. This study showed that rapes, gang rapes, and abductions are salient features of wartime sexual violence. The whole community is targeted, irrespective of sex, age, level of education or marital status. Perhaps surprisingly, studies from Liberia and DRC highlighted that males were commonly victims and females sometimes perpetrators.^{14,41} The most commonly reported serious outcomes were unwanted pregnancy, psychological distress and mental illness including PTSD, depression or anxiety, and shame, anger or guilt. The outcomes of sexual violence are likely to be on those affected, their families and communities, their children and also on the perpetrators of these crimes.

It is difficult to draw definitive conclusions on the physical, mental or social consequences of sexual violence due to many factors. First, while some outcomes might be specific in samples with sexual violence such as traumatic genital injuries or fistulae, other outcomes such as mental health distress might not be caused by sexual violence alone. In addition, the differences in the type of sexual violence

Table 3 – Prevalence (% and 95% CI) of physical consequences of sexual violence by country and sex.

Study no.	Authors, year	Sex	Rectal and vaginal fistulae	Traumatic genital injury	Vaginal discharge	STDs	HIV/AIDS	Pregnancy	Sexual dysfunction	Infertility
Females										
Africa										
Democratic Republic of Congo										
1	RFDA et al., 2005 ¹⁷	F (492)	41 ^a (35–47)	14 (11–18)	85 (78–94)			10 (8–14)	37 ^g (32–43)	
2	MSF 2007 ⁴⁷	F (2695)			10 (9–11)			3 (3–4)		
3	Mukwege and Nangini 2009 ⁴⁰	F (7519)	16 (15–17)			21 ^c (20–22)	5 (4–5)			
5	Bartels et al., 2010 ³⁹	F (1021)			5 (4–7)			6 (5–8)		
6	Johnson et al., 2010 ¹⁴	F (202)		29 (22–37)		17 (12–24)		15 (11–22)		
7	Baelani and Dunser 2011 ⁵²	F (1343)	9 ^b (8–11)							
8	Kelly et al., 2011 ¹⁸	F (193)						13 (9–19)		
10	Kohli et al., 2012 ⁵⁰	F (657)				84 ^e (77–91)				
11	Mankuta et al., 2012 ⁴⁹	F (441)		2 (1–4)						
12	Dossa et al., 2014 ²⁰	F (67)	24 (15–39)					46 (33–66)	57 (41–78)	
Congo										
13	Hustache et al., 2009 ⁵¹	F (178)		22 (16–30)				11 (7–17)	33 (N = 64) (21–50)	
Liberia										
15	Kinyanda et al., 2010b ⁴³	F (448)	22 ^b (18–26)							22 (18–27)
Sierra Leone										
16	Amowitz et al., 2002 ¹²	F (369)				20 (16–25)		9 (7–13)		20 (N = 94) ^d (13–32)
Uganda										
17	Kinyanda et al., 2010a ⁴⁴	F (164)	14 ^{a,b} (9–21)	19 (13–27)	32 (24–42)	29 ^f (22–38)	5 (3–11)	10 (6–17)	20 (14–28)	36 (28–46)
Europe										
Croatia										
19	Loncar et al., 2006 ⁴⁶	F (68)						43 (30–61)	25 (16–40)	
Males										
Africa										
Democratic Republic of Congo										
6	Johnson et al., 2010 ¹⁴	M (88)		13 (7–23)		5 (2–12)		3 ^h (1–11)		
Europe										
Croatia										
20	Loncar et al., 2010 ²¹	M (60)		12 (6–24)					48 (34–70)	

CI, confidence interval; STD, sexually transmitted disease; HIV, human immunodeficiency virus; AIDS, acquired immune deficiency syndrome.

Studies are presented in chronological order of publication.

The first line is the prevalence (%), and the second is the 95%CI.

The corresponding N for each cell is provided in the [Supplementary Material \(Table S7\)](#).

^a Vaginal discharge of urine and faeces – signs of vesicovaginal and rectovaginal fistulas.

^b Percentage of subjects with vaginal fistulae. In Kinyanda et al., 2010, 7% of the subjects had rectal fistulae.

^c Percentage of subjects having genital infection. Of the subjects, 9% were also diagnosed with vaginal trichomonas, 3% with syphilis, 14% with candida infection and 18.2% with urinary infection.

^d Self-reported reproductive complication and/or miscarriage.

^e Symptoms similar to STDs and 18.9% with urinary infection.

^f Percentage of subjects having genital sores, which are commonly caused by herpes and other STDs.

^g Percentage of subjects with a feeling of disgust around sex, additionally 86% were reported having dyspareunia.

^h Pregnancies reported by male survivors of sexual violence forced into sexual servitude by female combatant who became pregnant.

Table 4 – Prevalence (% and 95% CI) of mental health disorders and social consequences of sexual violence by country and sex.

Study no.	Authors, year	Sex (N)	Post-traumatic stress disorder	Depression	Anxiety disorders including phobias	Social dysfunction	Suicide attempts	Suicidal ideation	Alcohol and substance abuse	Stigmatized by family and/or community	Spousal abandonment
Females											
Africa											
Democratic Republic of Congo											
1	RFDA et al., 2005 ¹⁷	F (492)			18 (15–22)	92 (83–100)					
2	MSF 2007 ⁴⁷	F (2695)			13 (12–15)						
3	Mukwege and Nangini 2009 ⁴⁰	F (836)									11 (9–13)
4	Steiner et al., 2009 ¹⁸	F (9109)								12 ^b (11–14)	
5	Bartels et al., 2010 ³⁹	F (1021)			25 (22–28)						6 (5–8)
6	Johnson et al., 2010 ¹⁴	F (174)	76 (64–90)	68 (57–81)	7 (4–12)		33 (25–42)	37 (29–47)	18 (13–25)	7 (4–2)	
8	Kelly et al., 2011 ¹⁸	F (193)								29 ^c (22–37)	26 (20–35)
9	Schalinski et al., 2011 ⁴²	F (53)	70 (51–96)	57 (40–81)							
10	Kohli et al., 2012 ⁵⁰	F (657)		44 (39–49)	30 (26–34)	12 (10–15)		0.3 (0–1)			20 (16–24)
11	Mankuta et al., 2012 ⁴⁹	F (440)	12 (9–16)								
Congo											
13	Hustache et al., 2009 ⁵¹	F (159)	3 ^a (1–8)	9 (5–15)	54 (44–67)	9 ^d (N = 64) (4–21)					
Liberia											
14	Johnson et al., 2008 ⁴¹	F (63)	60 (43–82)	49 (35–70)		13 (6–25)	10 (1–18)	18 (10–32)	3 (1–13)		
15	Kinyanda et al., 2010b ⁴³	F (448)	41 (36–48)				13 (10–17)		12 (9–16)		
Sierra Leone											
16	Amowitz et al., 2002 ¹²	F (94)								15 (9–25)	
Uganda											
17	Kinyanda et al., 2010a ⁴⁴	F (164)	68 (57–82)				19 (13–27)		20 (14–28)		
Europe											
Croatia											
19	Loncar et al., 2006 ⁴⁶	F (68)	31 (20–47)	76 (58–100)	75 (57–99)	62 (46–84)	37 (25–54)				
Males											
Africa											
Democratic Republic of Congo											
6	Johnson et al., 2010 ¹⁴	M (87)	56 (43–75)	48 (35–64)	14 (8–24)		23 (15–36)	39 (31–59)	50 (38–68)	3 (1–11)	
Liberia											
14	Johnson et al., 2008 ⁴¹	M (33)	36 (21–64)	33 (18–60)		39 (23–68)	4 (0–11)	15 (6–36)	3 (0–22)		
Europe											
Croatia											
20	Loncar et al., 2010 ²¹	M (60)	95 ^e (73–100)		62 ^f (45–85)	67 (49–91)					

CI, confidence interval.

The corresponding N for each cell is provided in the [Supplementary Material \(Table S8\)](#).^a Percentage of subjects diagnosed with PTSD; 24.6% were diagnosed with acute stress disorder and 3.1% with adjustment disorder.^b Percentage of subjects rejected by family in 2005, the researchers also report approximately 6% of family rejection in 2006 and 2.4% in 2007.^c Percentage of subjects rejected by family, 6% also reported being rejected by community.^d Percentage of subjects with quite intense anhedonia.^e Percentage of subjects reporting reviving the trauma through nightmares and flashbacks.^f Percentage of subjects reporting tachycardia.

Table 5 – Summary of percentage prevalence of selected (a) physical, (b) mental and (c) social outcomes of sexual violence in conflict settings.

Outcome	Number of studies reporting	Median prevalence	25th percentile	75th percentile	Minimum reported prevalence	Maximum reported prevalence
(a) Physical						
Fistula	6	19	15	24	9	41
Traumatic genital injury	7	14	13	21	2	29
Vaginal discharge	4	21	9	45	5	85
STDs	6	21	18	27	5	84
HIV/AIDS	2	5	5	5	5	5
Pregnancy	11	10	8	14	3	46
Sexual dysfunction	6	35	27	45	20	57
Infertility	3	22	21	29	20	36
(b) Mental						
PTSD	11	56	34	69	3	95
Depression	8	49	41	60	9	76
Anxiety	9	25	14	54	7	75
Social dysfunction	7	39	13	65	9	92
Suicide attempts	7	19	12	28	4	37
Suicidal ideation	6	28	16	37	0.3	39
Alcohol and substance abuse	6	15	5	20	3	50
(c) Social						
Stigmatized by family and/or community	5	12	7	15	3	29
Spousal abandonment	4	16	10	22	6	26

CI, confidence interval; STD, sexually transmitted disease; HIV, human immunodeficiency virus; AIDS, acquired immune deficiency syndrome; PTSD, post-traumatic stress disorder.

Table S9 provides the summary of percentage prevalence of selected (a) physical, (b) mental and (c) social outcomes of sexual violence in conflict settings, by sex.

experienced by the participants in the included studies might explain some of the heterogeneity. For instance, in the study by Bartels et al.,³⁹ pregnancy was 37 times commoner following sexual slavery than following other types of sexual violence, while the high rate of pregnancy in Croatia might be due to the fact that many women were forcibly impregnated, with some held in rape camps until they were too far into their pregnancies to abort the 'ethnically cleansed' child.^{46,53,54}

The difference in the measurements or definitions can also explain some of the heterogeneity. For instance, in one study,⁴⁴ the HIV prevalence was estimated from self-report or observation rather than a formal medical diagnosis. Variation in outcomes is also related to access to health care and care-seeking behaviour. Many people relied on self-medication¹⁷ or sought health care when their health status had already deteriorated¹⁶ and only a minority received emergency contraception or prophylaxis. Some outcomes such as infertility or pelvic pain might result from STDs or inflammatory diseases associated with sexual violence.^{44,55}

With regard to mental health disorders, differences in definitions and measurements might explain some of the cross-study variability. Some measurement tools might not measure all the relevant consequences of psychological trauma⁵⁶ or might not be valid in conflict contexts.^{51,57} For instance, the TSQ tool used in the study by Hustache et al.⁵¹ showed a low prevalence of PTSD (3%). The researchers recognized their result were different from European or North American studies where posttrauma PTSD prevalence was between 60% and 80%.⁵¹ However, other studies found a high prevalence of PTSD.^{14,41,42,44} The possibility of culturally and

contextually different responses to trauma, particularly its later complications, remains. Mental health disorders might differ depending on the type of sexual violence experienced. Some studies conducted in peace-time environments found no effect for weapon use on posttrauma distress,^{58–60} but Bownes et al.⁶¹ identified that victims with PTSD had experienced more weapon use than those without PTSD. Given this, we might have expected high levels of PTSD in conflict zones so the validity of measurement tools needs evaluation. Dissociation might also be a major contribution factor for higher prevalence of PTSD in victims of sexual violence.^{42,62,63} In addition, with regard to PTSD, it has been shown that the multiplicity of traumatic experiences influences the prevalence of PTSD⁶⁴ and also the rate of recovery.⁶⁵ Hence, mental health disorders might not be caused by sexual violence alone given the numerous traumatic experiences in war zones. The difference in the recall period could have contributed to the heterogeneity of the prevalence rates.^{14,18,46,66} Finally, the extreme high prevalence rates reported in some studies might reflect selection and reporting bias. For instance, the prevalence rates of fistulae ranged from 9% to 41%, while according to Onsrud et al.,⁶⁷ only 4% of all fistulae treated in the Panzi Hospital (DRC) were resulting from sexual violence. In addition, the studies in Croatia seemed to be outliers in having extremely adverse consequences. This might reflect the small sample size, enrolment from a centre for treatment of survivors of torture or the scale and extent of the violence during the war. A large number of traumatized survivors was highlighted in the literature,^{68,69} and the war narratives, especially from detention camps, relate highly traumatic events such as

castration, circumcision, prisoners forced to bite off the testicles of other prisoners, and people forced at gunpoint to anally rape each other.^{9,70}

Mutually reinforcing consequences of sexual violence

Social consequences can lead to psychological and physical suffering and vice-versa.^{18,47} Social rejection/stigmatization might result in late care seeking and then high prevalence of related complications. Physical problems can trigger social ones, e.g., unwanted pregnancy was linked to community isolation, and as an obstacle to mental recovery.¹⁸ However, the social outcomes might change over time. Steiner et al.⁴⁸ highlight that the prevalence of social exclusion/stigma during their study period (2005–2007) decreased substantially, possibly because ‘...so many women throughout the society have been sexually assaulted that discrimination against them lessens’.

The intergenerational effects of war-related sexual violence

Reports show that many victims are children.^{16,22,71} A number of studies performed in both peace-time and conflict environments suggest that experiencing sexual violence, especially as a child, has negative consequences throughout an individual's life cycle.^{18,72} Sexual violence also has effects that extend beyond the victims. Many survivors have to raise unwanted children, perhaps without family/community support. Those ‘children of bad memories’⁷³ are subject to negative social pressure and are particularly vulnerable, e.g., to malnutrition, not being educated, and exploitation and ostracization.^{74–77} Mukwege et al.⁷⁸ reported that since 2003, of children conceived as a result of rape under the care of Panzi Hospital, 11% were HIV positive and 10% were orphans.

Inadequate access to health services

In DRC, Johnson et al.¹⁴ estimated that 1.31 million women and 0.76 million men are survivors of sexual violence and might need specialist health services. In DRC rural areas, only a few healthcare centres are still functioning and many cannot adequately address the more complicated cases.⁵² In cities, hospitals are stretched beyond capacity and unable to deal with all the cases presented.¹⁷ The mental health needs of survivors are often the least well addressed in low resource or conflict settings.^{41,43} Vulnerable populations such as survivors with fistulae also need specialized, long-term services that are currently lacking.^{8,18} It is crucial that treatment programmes for survivors meet their time-sensitive medical needs and provide them with culturally appropriate psychological care. This review also raises the question of the rights of women regarding access to abortion, since abortion is illegal in some countries, e.g., in DRC.

Limitations of the review

This systematic review has limitations. It is founded upon an MPH dissertation, which was independent work by IB (supervised by RSB). The protocol for the MPH project was an evolving document to support the development of the project.

For this paper, RSB independently examined all references by Medline, and no changes to the selection were made. He also examined the data in the main tables against the original papers. RSB and IB conferred an agreed all the changes that resulted.

In addition, the search strategy did not include regional or psychological databases for study identification. However, while these databases were not part of the formal strategy, in the finalization of this manuscript, these databases were searched and no additional article was found.

Furthermore, this review excluded studies with fewer than 50 people and those in languages other than English, Spanish and French. Some excluded studies have interesting conclusions despite their small sample size^{54,55,68,79,80} or their languages.⁸¹ Small studies from Croatia/Bosnia and Herzegovina indicated rates of pregnancy, PTSD and depression similar to this review,^{54,55,68} while others gave insight into conflicts in Syria and Peru.^{79,80}

The MMAT was chosen to assess the quality of the included studies, as it has been designed for systematic literature reviews of complex and mixed-method studies. The tool gave us insights into the variable and sometimes low quality of included studies. While other quality appraisal tools might be equally, or more, applicable, it is unlikely that deeper insights will be obtained. The MMAT appraisal shows the challenge for researchers to enhance the quality of studies, notwithstanding the difficulties of the topic and the settings where the research is conducted.

Finally, although sexual violence is a global phenomenon, the search identified studies from predominantly DRC (60% of the included studies) and thus limits the generalizability of our findings to other contexts. Besides, research is mostly being done in those conflicts that are known to have pervasive sexual violence and characterized by sexual violence with extreme brutality and therefore likely worse outcomes. The interpretation of the calculated confidence intervals is problematic as they are rarely based on random samples of the at-risk population. Sociodemographic characteristics, type of sexual violence, associated violence, and healthcare seeking behaviour may also be unequally distributed across the studies making across-study comparison difficult. This study cannot attribute the health outcomes to sexual violence alone although they are likely to be partly causally connected. In addition, the outcomes included reflect the ones reported in the literature, while others of importance (e.g. death) are not available.

Conclusion

This study is the first systematic review on the health consequences of war-related sexual violence in civilians. It highlights that the number and quality of the studies conducted is not consistent with the extent or the significance of the problem. There is limited precise, valid, systematic data documenting the scope, frequency and consequences of sexually violent acts committed against civilians during conflicts, to support fully informed evidence-based policy decisions. This study highlights the importance of including men as victims in conceptualizations of sexual violence, as well as the importance that future research agrees upon a common framework to define war-related sexual violence so

as to be able to meaningfully compare the consequences across conflicts and combatant groups. The health research community needs to build on the evidence summarized here to effect change in preventing and responding to the problem we have studied.

Author statements

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Ethical approval

Not required. IB, in conjunction with RSB, determined that the proposed research did not pose reasonably foreseeable ethical risks. Self-audit checklist for level 1 ethical review was completed as required from the University of Edinburgh. The completed and signed level 1 form approved by the University of Edinburgh can be provided upon request.

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Competing interests

None declared.

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Appendix A. Supplementary Material

Supplementary material related to this article can be found at <http://dx.doi.org/10.1016/j.puhe.2016.07.019>.