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REVIEW ARTICLE

Recent physical and sexual violence against adults with severe mental illness: a systematic review and meta-analysis

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ABSTRACT

People with severe mental illness (SMI) have high prevalence of lifetime victimization, but little is known about the extent and risk of recent domestic/sexual violence. The objective was to synthesize evidence on prevalence, odds, and risk factors for recent violence against people with SMI, with a focus on domestic and sexual violence. Relevant studies were identified through literature searches in Medline, Psychinf, Embase (for studies published in 2010–2015), and through existing systematic reviews (for studies published in 2000–2014). The review included 30 studies (with 16 140 SMI participants), including six on domestic violence and 11 on sexual violence. Prevalence of recent domestic violence ranged from 15–22% among women and from 4–10% among men/mixed samples; with little evidence on risk compared with the general population. Median prevalence of sexual violence was 9.9% (IQR = 5.9–18.1%) in women and 3.1% (IQR = 2.5–6.7%) in men; with 6-fold higher odds of victimization compared with the general population. There was little evidence on risk factors for domestic or sexual violence. In conclusion, people with SMI have a high prevalence of recent domestic and sexual violence, but little is known about risk factors for these violence types, or extent of domestic violence victimization compared to the general population.

Introduction

Domestic and sexual violence are important public health problems, with well-established associations with mental ill health (Ellsberg, Jansen, Heise, Watts, & Garcia-Moreno, 2008; World Health Organization, 2013). Evidence from longitudinal studies suggests that the relationship is likely to be bi-directional, with intimate partner violence (IPV) being associated with incident depression, and conversely depression being associated with incident IPV (Devries et al., 2013). The extent and correlates of recent violence against people with pre-existing mental disorders are important from public health and clinical perspectives, since victimization is associated with poorer quality-of-life and greater treatment resistance among psychiatric patients (Mueser, Rosenberg, Goodman, & Trumbetta, 2002; Neria, Bromet, Carlson, & Naz, 2005); and health professionals are well placed to detect and address victimization (Howard et al., 2010; NICE, 2014). This review focuses on recent physical and sexual violence against people with severe mental illness

(SMI), including violence perpetrated by partner or family members (domestic violence) as well as violence perpetrated by strangers or acquaintances (community violence). People with SMI may be particularly vulnerable to victimization (Hiday, Swartz, Swanson, Borum, & Wagner, 1999; Khalifeh, Johnson, et al., 2015; Latalova, Kamaradova, & Prasko, 2014; Maniglio, 2009; Teplin, McClelland, Abram, & Weiner, 2005) and their contact with psychiatric services provides a window of opportunity for intervention (Howard et al., 2010).

A recent systematic review on violence against people with diagnosed psychiatric disorders found a high prevalence and increased odds of adulthood and recent domestic violence against people with depressive disorders, anxiety and PTSD, with limited evidence for other diagnoses (Trevillion, Oram, Feder, & Howard, 2012). A systematic review on domestic violence against psychiatric patients estimated that a third of patients had been victims of adulthood domestic violence, but there was limited evidence for

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male patients and for recent victimization, and no comparative studies were identified (Oram, Trevillion, Feder, & Howard, 2013). Hughes et al. (2012) systematically reviewed the evidence on prevalence and risk of past-year physical or sexual violence by any perpetrator against people with disabilities—including people with common mental disorder or severe mental illness (SMI)—and estimated that around a quarter of people with mental illness had experienced recent physical violence—a 4-fold increased risk compared to those without mental illness—around 6% had experienced recent sexual violence and nearly 40% had experienced recent IPV. However, the above reviews had a number of limitations. They did not examine risk factors for victimization, and, due to data limitations, they did not examine victimization stratified by gender. These are important gaps, since a better understanding of victimization risk by gender and of the relative importance of different risk factor domains (e.g. socio-demographic vs clinical) is needed for developing effective, gender-sensitive interventions.

This systematic review aims to address the evidence gaps outlined above. The study objectives were: (1) to synthesize the evidence on the prevalence and relative odds of recent violence against people with SMI, stratified by gender; including (a) physical or sexual violence by any perpetrator; (b) physical or sexual domestic violence; and (2) to synthesize the evidence on risk factors for violence victimization among people with SMI (with a focus on risk factors for domestic or sexual violence). Relevant studies published in 2000–2015 were identified from published systematic reviews, and from a primary search of the literature for studies published in the period 2010–2015.

Methods

PRISMA and STROBE guidelines were followed (Liberati et al., 2009; Vandenbroucke et al., 2007).

Definitions of SMI and violence

Severe mental illness (SMI) was defined as either (a) having a psychotic disorder (i.e. schizophrenia, schizoaffective disorder, bipolar disorder, or depressive disorder with psychotic symptoms); measured using a validated diagnostic instrument or from clinical records; or (b) being under the care of secondary mental health services.

Violence was defined as any physical or sexual violence by any perpetrator, including (a) violence perpetrated by partners/ex-partner/family members (domestic violence) or (b) violence perpetrated by strangers or acquaintances (community violence). Sexual violence was defined as sexual harassment, unwanted sexual touching, rape or attempted rape by any perpetrator.

Recent violence was defined as violence occurring within the past 3 years. This was guided by the definition of 'recent violence' in relevant published studies, with most studies including violence occurring within the past 12 months, but a few studies including violence occurring within a longer time period of up to 3 years.

Study selection criteria

Study inclusion criteria were: (1) Randomized controlled trial (RCT), case-control, cross-sectional, or cohort study published in a peer-reviewed journal; (2) reported on prevalence or risk factors for recent physical or sexual violence against people with SMI (occurring within the past 3 years); (3) reported on experiences of people aged over 18; (4) written in English; and (5) published in the period 1 January 2000–17 February 2015. For odds estimates, an additional inclusion criterion was that the study reported on relative risk or odds of being a victim of recent violence among adults with vs those without SMI (or reported data from which this could be estimated). Studies were excluded if they (a) reported on any criminal victimization without separately reporting on violence, (b) included people with any mental illness (e.g. common mental disorders), without separately reporting on people with SMI, (c) did not specify whether violence was experienced in childhood (aged <16) or adulthood (age >16), (d) focused on selected populations (e.g. prisoners, homeless people, immigrants, forensic population, domestic violence shelter attendees, women with perinatal psychiatric disorders), or (e) would result in duplication of included data (for studies with multiple reports we included the study with the largest sample size).

Search strategy, data extraction, and quality measures

Studies were identified using two methods: (1) from a search of the primary literature for studies published in 2010–2015 (using the methods detailed below); (2) from five published systematic reviews on violence against people with SMI for studies published from 2000–2014 (Hughes et al., 2012; Latalova et al., 2014; Maniglio, 2009; Oram et al., 2013; Trevillion et al., 2012) This was supplemented by screening reference lists of retrieved studies.

Medline, Embase, and Psychinfo were searched for primary research studies published between 1 January 2010 and 17 February 2015 that reported on prevalence or relative odds/risk of violence against people with SMI in adulthood. A search strategy was developed and adapted for each database, including free text and index terms (see Appendix). Search terms were developed for the two categories of 'severe mental illness' ((mental* or psychiatric*) adj2 (ill or illness* or disorder* or patient*)) or (schiz* or bipolar or psychos* or psychot*) and 'violence victimization' ((viol* or assault* or abus* or agressi* or maltreat* or rape*) and (victim* or against)).

References were managed using Endnote. One reviewer screened the titles/abstracts of all references for potential relevance and excluded studies which were clearly irrelevant or which clearly met one or more exclusion criteria. The reason for study exclusion was recorded, using a hierarchical list of inclusion/exclusion criteria (see Figure 1). A second reviewer assessed 10% of excluded studies and any disagreements re-exclusion were resolved by consensus. Two reviewers assessed the remaining references for eligibility for inclusion using full-text screening. A standard electronic form was used to extract data on all included studies, including data on study design
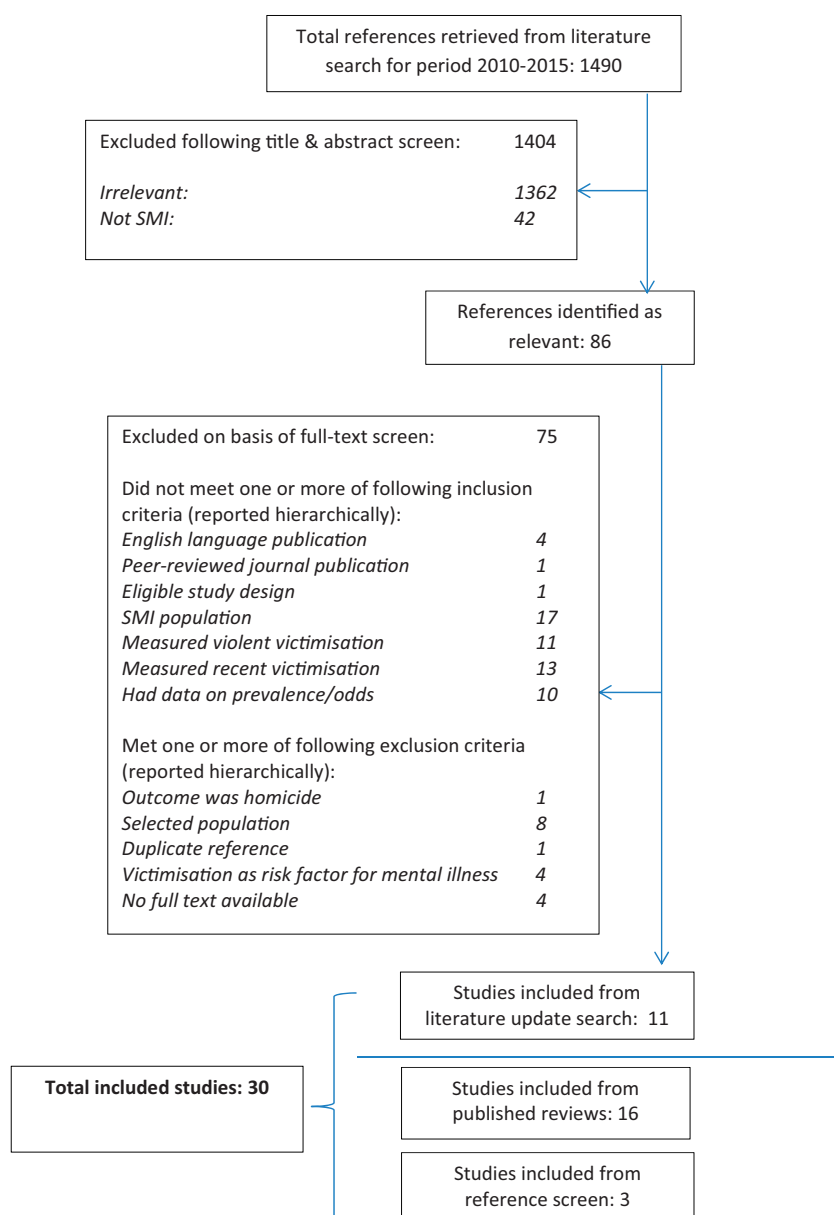

Figure 1. Flowchart of included studies.

and methods, population, outcomes (prevalence and risk), risk factors and quality-related measures.

Study quality was based on international standards, with an emphasis on standards to assess for bias and confounding in observational studies (Vandenbroucke et al., 2007). Six quality criteria were used for prevalence studies, and a further six criteria for comparative studies, with a maximum score of 12 for each (see Table S2). Studies which provided both prevalence and comparative data were assigned two separate quality scores. Study quality was assessed by two reviewers (with disagreements resolved by consensus). Study quality was used in the analysis by stratifying on total quality score and on individual quality measures in sub-group meta-analyses (since the total score can be biased and may fail to reflect the global quality of a study) (Higgins & Green, 2011).

Risk factor analyses

Risk factors were grouped into the following six domains: demographic, social, clinical, substance misuse, violence perpetration and childhood abuse. This was based on the World Health Organization's violence conceptual framework (Krug, 2002), and on past research on key risk factors for violence in the general population and among people with SMI (Abramsky et al., 2011; Maniglio, 2009; Witt, van Dorn, & Fazel, 2013). For each study, information was extracted about risk factors reported in univariate and multivariate analyses, including: (a) total number and number victimized among those with and without a given risk factor; (b) reported crude and adjusted ORs (with 95% confidence intervals/standard errors); and (c) risk factor domains included in the multivariate analyses. Where ORs were not reported, information was extracted on whether a given factor was reported as being associated or not with victimization, and the related p-value. For odds ratios reported in the text, the following qualitative descriptions were used: weak (OR = 1.2–1.5), moderate (OR = 1.6–2.5), and strong (OR > 2.5).

Heterogeneity analyses

The factors that could explain heterogeneity in the estimates of victimization prevalence/risk were grouped into the following four domains: (a) study design & setting: design, country, clinical setting (inpatient vs outpatient); (b) study population: gender (operationalized as percentage male) and diagnosis (operationalized as percentage with schizophrenia); (c) violence measures: violence timeframe, type

(physical or sexual vs physical only) and measure (long structured questionnaire vs brief questionnaire); and (d) study quality: sampling method, response rate, total number of participants, and total quality score.

Statistical analysis

Victimization prevalence was estimated using raw data. Exact binomial confidence intervals were calculated using the Clopper-Pearson method (a standard method for estimating confidence intervals based on proportions, using the binomial distribution) (Clopper & Pearson, 1934). Crude odds ratios (for victimization in people with vs without SMI (and for victimization among SMI people with vs without a given risk factor) were estimated using raw data where possible. Confidence intervals were calculated using Woolf's formula (a standard method for calculating confidence intervals based on ln(OR)) (Kirkwood & Sterne, 2003a). Where raw data was not available, the published ORs and their confidence intervals (CIs)/standard errors (SEs) were used. Where CIs/SEs were not reported but p-values were given, the SEs were calculated by converting p-values to z-values and then calculating the standard errors (Deeks, Higgins, & Altman, 2011). Meta-analyses were conducted using STATA version 12. Pooled prevalence and pooled ORs (with 95% CI) were estimated using a random effects model. This model was used since there was wide variation in the settings, populations and measures of SMI/violence in the included studies—such that the true effect was likely to vary between studies (Kirkwood & Sterne, 2003a). The Stata metan command was used, which employs the DerSimonian and Laird method (DerSimonian & Laird, 1986). Meta-analyses were only conducted where three or more studies reported a given estimate. Forest plots were used to graphically display study and pooled estimates, with 95% CIs. Based on past reviews, it was anticipated that the meta-analyses would show a high degree of heterogeneity (Hughes et al., 2012). In this review, meta-analyses were carried out and presented even where heterogeneity was high—in order to describe the extent of heterogeneity and to explore its potential sources. Heterogeneity for prevalence/risk estimates was tested using the I^2 statistic (reported with 95% CI). This estimates the proportion of variation across studies due to heterogeneity between study effect estimates rather than chance (Deeks et al., 2011). Potential sources of heterogeneity were explored using random-effects meta-analyses stratified by relevant sub-groups and by inspection of related

forest plots. It is recognized that, where heterogeneity is high, the pooled estimate is unlikely to be a valid summary of individual study findings and that the individual study estimates need to be inspected.

Risk of publication bias was assessed using funnel plots and Peter's test for odds ratio estimates (Peters, Sutton, Jones, Abrams, & Rushton, 2006).

Results

Included studies

Figure 1 shows the study selection flowchart. Thirty studies on recent violence by any perpetrator against people with SMI were identified, with a total of 16 140 participants with SMI. Details of all included studies are given in Table 1, and their characteristics are summarized in Table 2. Of these 30 studies, six studies reported on recent domestic violence (DV); including three studies that reported exclusively on intimate partner violence (Chang et al., 2011; McPherson, Delva, & Cranford, 2007; Morgan, Zolese, McNulty, & Gebhardt, 2010) and three studies that reported separately on domestic and community (see Table 4) (Bengtsson-Tops & Ehliasson, 2012; Katsikidou et al., 2013; Khalifeh, Moran, et al., 2015).

Prevalence and odds of any or physical violence (all perpetrators)

For this analysis where data were reported separately for physical and sexual violence we used prevalence for physical violence, otherwise we used prevalence for any (physical or sexual) violence. Thirty studies reported on prevalence of any/physical violence (regardless of perpetrator). The results are shown in Table 1 and in Figure 2, stratified by patient gender where this data were available. The 30 studies included a total of 16 140 participants, 2702 (16.7%) of whom reported being a victim of any/physical violence (median prevalence = 18.6%, interquartile range (IQR) = 10.9–26.2%). The median prevalence of any/physical victimization was 20.7% in women (IQR = 12.6–27.1%) and 17.8% in men (IQR = 9.9–25.6%). Pooled prevalence is shown in Figure 2, but heterogeneity was high so this was unlikely to be a valid summary of individual study estimates. There was no evidence that any of the variables examined (relating to study design & setting, population, violence measures and study quality) accounted for the heterogeneity in prevalence estimates. The pooled crude OR of any/physical victimization in women compared with men was 1.1 (CI = 0.90–1.4, $p = .31$; $I^2 = 72\%$; $n = 16$ studies), suggesting a lack of association with gender.

Nine studies reported odds for any/physical victimization in people with vs without SMI. Results are shown in Table 3 and Figure 3 (in the latter stratified by gender where data were available). These studies included a total of 3403 people with SMI and 106 328 people without SMI. All studies showed increased crude odds of victimization among people with vs those without SMI; including studies of women with vs without SMI (pooled crude OR = 9.2, CI = 3.2–26.7, $I^2 = 95\%$; $n = 3$ studies), of men with vs without SMI (pooled crude OR = 5.4, CI = 2.2–13.1, $I^2 = 92\%$; $n = 3$ studies) and of men or women with vs without SMI (pooled crude OR = 5.6, CI = 3.7–8.6, $I^2 = 74\%$; $n = 6$ studies).

Prevalence and odds of any or physical domestic violence

Six studies reported on past-year violence perpetrated by family members and/or partners (see Table 4 and Figure 4). The results are difficult to synthesize quantitatively due to heterogeneity in violence definitions and victim gender. Three studies reported the prevalence of DV against women (prevalence range = 15–22%) (Khalifeh, Moran, et al., 2015; McPherson et al., 2007; Morgan et al., 2010); three studies reported the prevalence of DV against men or women (prevalence range = 3–15%) (Bengtsson-Tops & Ehliasson, 2012; Chang et al., 2011; Katsikidou et al., 2013) and only one study reported prevalence of DV against men (6% for family violence and 9% for partner violence) (Khalifeh, Moran, et al., 2015). Two studies reported findings separately for partner and family violence, and found similar prevalence for these violence sub-types (Bengtsson-Tops & Ehliasson, 2012; Khalifeh, Moran, et al., 2015).

Only two studies reported odds of DV in people with SMI compared with the general population; with one UK study reporting 3–7-fold higher odds (Khalifeh, Moran, et al., 2015); and one Greek study reporting 22-fold higher odds (Katsikidou et al., 2013).

Prevalence and odds of sexual violence (all perpetrators)

The prevalence of sexual victimization (regardless of perpetrator) is shown in Table 1 and in Figure 5, stratified by gender where this data were available. A sub-set of 11 prevalence studies provided estimates for recent sexual violence victimization. These studies included 5427 participants, 310 (5.7%) of whom reported being a victim of recent sexual violence. The

Table 1. Details of all included studies.

Reference	Year	Design	Country	Setting	Inclusion criteria	SMI n	Sex	Mean age (SD)/range	Time (months)	Violence type	Prevalence (95% CI)	Quality score (Max =12)[a]	Recent domestic violence reported?
Bengtsson-Tops and Ehliasson (2012)	2012	CS	Sweden	OP (multi-centre)	Psychosis, ongoing service contact, living in community	174	M&F	46	12	Any Physical Sexual	33.3 (26.4–40.9) 19.5 (13.9–26.2) 14.9 (10.0–12.1)	8	Yes (sub-type)
Bengtsson-Tops, Markstrom, and Lewin (2005)	2005	CS	Sweden	OP&IP (regional)	Contact with services; excluded acute psychosis, LD	1382	F	39 (13)	12	Physical Sexual	5.9 (4.7–7.2) 3.2 (2.3–4.3)	7	No
Brekke, Prindle, Bae, and Long (2001)	2001	CS	USA	OP (local)	Schizophrenia	172	M&F	33 (7)	36	Any Physical Sexual	34.3 (27.2–41.9) 16.3 (11.1–22.7) 0.6 (0–3.1)	4	No
Chang et al. (2011)	2011	CS	USA	OP&IP (local)	SZ, bipolar, PTSD, anxiety	428	M&F	39	12	Physical (IPV) Sexual (IPV)	10.3 (7.6–13.6) 5.6 (3.6–8.2)	6	Yes (exclusively)
Chapple et al. (2004)	2004	CS	Australia	OP&IP (multi-centre)	Psychosis	962	M&F	18–64	12	Physical	17.9 (15.5–20.4)	6	No
Crisanti, Frueh, Crisanti, and Frueh (2014)	2014	CS	USA	OP (multi-centre)	SZ, bipolar, major depression, PTSD, PD	2208	M&F	42	6	Any	12.3 (11.0–13.8)	8	No
Dean et al. (2007)	2007	Cohort	UK	OP&IP (multi-centre)	Psychosis, 2+ past admission; excluded primary substance misuse, brain disorder	632	M&F	38 (11)	24	Physical	23.1 (19.9–26.6)	7	No
Fitzgerald et al. (2005)	2004	CS	Australia	OP&IP (regional)	Schizophrenia spectrum	348	M&F	34 (10)	1	Any	4.3 (2.4–7.0)	5	No
Fortugno et al. (2013)	2013	CS	UK	IP (multi-centre)	Schizophrenia spectrum	357	M&F	36	12	Physical	37.8 (32.8–43.1)	5	No
Fortugno et al. (2013)	2013	CS	Europe (6 countries)	IP (multi-national)	Schizophrenia spectrum	543	M&F	40	12	Physical	28.0 (24.3–32.0)	5	No
Goodman et al. (2001)	2001	CS	USA	OP&IP (multi-centre)	SZ, SZA, bipolar, major depression	782	M&F	43 (10)	12	Any Physical Sexual	35.0 (31.7–38.5) 30.3 (27.1–33.7) 12.7 (10.4–15.2)	7	No
Hahn, Rigby, and Galletly (2014)	2014	CS	Australia	OP (multi-centre)	SZ, SZA, bipolar, psychotic depression	399	M&F	18–64	12	Any	23.1 (19.0–27.5)	4	No
Havassy and Mericle (2013)	2013	CS	USA	IP (local)	Service contact, no or public insurance, HIV−ve	419	M&F	18–50	1	Any	34.4 (29.8–39.1)	7	No
Hiday et al. (2001)	2001	RCT	USA	IP (multi-centre)	Psychosis; ill ≥1 year, treatment in past year, functionally impaired, OPC	331	M&F	41	4	Any	8.2 (5.4–11.6)	5	No
Hodgins, Alderton, Cree, Aboud, and Mak (2007)	2007	CS	UK	IP (local)	SZ, SZA, bipolar, major depression, drug/alcohol induced psychosis	205	M&F	38 (11)	6	Any	51.2 (44.2–58.2)	6	No
Honkonen, Henriksson, Koivisto, Stengard, and Salokangas (2004)	2004	Cohort	Finland	IP (multi-centre)	SZ (not sza/schizophrenifrom)	666	M&F	15–64	36	Any	5.5 (3.9–7.5)	6	No
Hsu et al. (2009)	2009	CS	Taiwan	OP&IP (local)	SZ, SZA, 'major affective'	155	M&F	37 (12)	12	Any	7.1 (3.6–12.3)	7	No

(continued)

Table 1. Continued

Reference	Year	Design	Country	Setting	Inclusion criteria	SMI n	Sex	Mean age (SD)/range	Time (months)	Violence type	Prevalence (95% CI)	Quality score (Max =12)[a]	Recent domestic violence reported?
Kamperman et al. (2014)	2014	CS	Netherlands	OP (multi-centre)	Psychosis, bipolar, major depression (> 2 years)	956	M&F	45 (10)	12	Physical / Sexual	6.4 (4.9–8.1) / 5.4 (4.1–7.1)	9	No
Katsikidou et al. (2013)	2013	CS	Greece	OP (local)	SZ, SZA, bipolar (DSM-IV), past IP treatment; exc. dementia, organic, sub mis	150	M&F	43 (12)	12	Physical / Sexual	28.7 (21.6–36.6) / 16.4 (8.8–27.0)	3	Yes (as subtype)
Khalifeh, Moran, et al., 2015	2015	CS	UK	OP (local)	CMHT care	303	M&F	41 (6)	12	Any (IPV) / Sexual	19.1 (14.9–24.0) / 6.3 (3.8–9.8)	8	Yes (as sub-type)
McPherson et al. (2007)	2007	Cohort	USA	OP&IP (local)	SZ, SZA, bipolar, major depn; caring for child aged 4–16	324	F	36 (5)	12	Any (IPV)	22.2 (17.8–27.1)	6	Yes (exclusively)
Morgan et al. (2010)	2010	CS	UK	OP (multi-centre)	CMHT care	71	F	50 (14)	12	Physical (IPV)	15.5 (8.0–26.0)	7	Yes (exclusively)
Schomerus et al. (2008)	2008	CS	Europe (UK, France, Germany)	OP&IP (multi-national)	SZ; no hospital past year, not homeless, not planning move	1204	M&F	41 (11)	30	Any	10.0 (8.4–11.9)	8	No
Silver et al. (2011)	2011	Cohort	USA	IP (multi-centre)	Recently discharged, civil admission	826	M&F	30 (6)	2.5	Any	19.4 (16.7–22.2)	7	No
Silver, Arseneault, Langley, Caspi, and Moffitt (2005)	2005	Cohort	New Zealand	Birth cohort (local)	Schizophrenia spectrum	38	M&F	21 (0)	12	Physical / Sexual	57.9 (40.8–73.7) / 13.2 (4.4–28.1)	7	No
Silver (2002)	2002	CS	USA	IP (local)	SZ/bipolar/ depression/ 'psychosis'/ sub mis/PD	270	M&F	18–40	2.5	Any	15.2 (11.1–20.0)	5	No
Sturup, Sorman, Lindqvist, and Kristiansson (2011)	2011	CS	Sweden	IP (local)	Recently discharged, social sec no.	390	M&F	37 (12)	12	Any	21.3 (17.3–25.7)	8	No
Teplin et al. (2005)	2005	CS	USA	OP&IP (local)	Psychosis/ major affective disorder, ever hospitalized, medication past 2 years; excluded 1st contact, in crisis	936	M&F	42 (11)	12	Any / Physical / Sexual	25.3 (22.6–28.2) / 19.0 (16.6–21.7) / 2.6 (1.6–3.8)	10	No
Tsigebrhan, Shibre, Medhin, Fekadu, and Hanlon (2014)	2014	CS	Ethiopia	Household survey (regional)	SZ, SZA, bipolar I	201	M&F	40 (8)	12	Any / Sexual	17.4 (12.4–23.4) / 2.5 (0.82–5.7)	9	No
White, Chafetz, Collins-Bride, and Nickens (2006)	2006	CS	USA	IP (local)	Contact with services	308	M&F	38	6	Any	25.6 (20.9–30.9)	3	No

Time: violence timeframe; CS: cross-sectional; OP: outpatients; IP: inpatients; M: male; F: female; IPV: intimate partner violence; CI: confidence interval; NR: not reported; NA: not applicable; SZ: schizophrenia; SZA: schizoaffective; sub mis: substance misuse; QoL: quality-of-life.
[a]See Supplementary Table S2 for details.

Table 2. Summary of characteristics of prevalence studies.

Characteristics	Number of studies (Total $n = 30$)
Design	
Cross-sectional	24
Cohort	5
RCT	1
Country	
USA	11
UK	5
Rest of Europe	8
Australia/New Zealand	4
Other (Taiwan, Ethiopia)	2
Setting	
Clinical inpatients	10
Clinical inpatients & outpatients	10
Clinical outpatients	8
General population	2
Gender	
Men and women	27
Women only	3
Violence timeframe	
1–6 months	8
12 months	18
24–36 months	4
Violence type	
Physical or sexual (not disaggregated by type)	14
Physical or sexual (disaggregated by type)	11
Physical violence only	5
Violence perpetrator	
Any (not disaggregated by perpetrator)	24
Any (disaggregated for community & domestic violence)	2
Intimate partner violence	4

median prevalence of sexual victimization was 9.9% (IQR = 5.9–18.2%) in women and 3.1% in men (IQR = 2.5–6.7%). Pooled prevalence is shown in Figure 5, but heterogeneity was high so this was unlikely to be a valid summary of individual study estimates. The pooled crude OR of sexual victimization was 3-fold higher in women compared with men (pooled crude OR = 3.4, CI = 2.5–4.6, $p < .001$; $I^2 = 0$; $n = 6$ studies). Six studies reported odds for sexual victimization in people with vs without SMI (see Figure 6), with pooled crude ORs ranging from 5-fold to 17-fold higher odds (pooled OR = 5.8, CI = 2.8–12.1; $I^2 = 87\%$).

Prevalence of sexual domestic violence

Two studies reported on recent sexual victimization by partners or family members. In Sweden, Bengtsson-Tops and Ehliasson (2012) estimated that 1–3% of male or female patients had been recently sexually assaulted by each of a partner, an ex-partner, or a family member—with 18% of all sexual assault victims being assaulted by an ex-partner. In Greece, Katsikidou et al. (2013) estimated that 0.7% of male or female patients had been recently sexually assaulted

by a family member (including partners), with 7% of all sexual assault victims being assaulted by a family member. Results were not reported disaggregated by gender.

Risk factors for violence (all perpetrators)

Eighteen studies reported associations between risk factors and recent violent victimization (by any perpetrator) (see Table 5). Meta-analyses of crude odds ratios showed that victimization was strongly associated with homelessness (pooled OR = 2.6, CI = 2.1–3.2, $I^2 = 15\%$), substance misuse (pooled OR = 2.4, CI = 1.8–3.0, $I^2 = 63\%$) and violence perpetration (OR = 4.4, CI = 2.5–7.6, $I^2 = 84\%$). Victimization was moderately associated with illness severity (e.g. as measured by impaired function, young illness onset, and the number of admissions) and weakly associated with symptom cluster. Victimization was not associated with any demographic factors (gender, ethnicity, or age), diagnosis, or socio-economic status at the 5% significance level (see Table 5).

Risk factors for domestic violence

Only one study reported risk factors for recent IPV (McPherson et al., 2007), and two studies reported risk factors for adulthood (but not recent) IPV (Chang et al., 2011; Morgan et al., 2010). McPherson et al. (2007) reported correlates of past-year physical or sexual partner violence among 379 mothers with SMI who were followed up prospectively. Victimization was associated with younger age, but not with other socio-demographics (ethnicity, marital status, and education). Clinically it was associated with alcohol or drug misuse and some markers of illness severity (number of hospitalizations, number of symptoms), but not with illness duration or diagnosis. Chang et al. (2011) reported correlates of adulthood (not recent) physical and sexual IPV among 428 male and female psychiatric patients. Physical IPV was commoner among women (OR = 4.7, CI = 2.7–8.2) and patients with a diagnosis of substance misuse or PTSD. Sexual IPV was commoner among women (OR = 12.4, CI = 4.9–31.1) and patients with a diagnosis of substance misuse or anxiety. Morgan et al. (2010) reported correlates of adulthood (not recent) physical partner violence among 70 female psychiatric outpatients. They found that victimization was associated with having children, a history of overdose, and sexual abuse since the age of 16; but it was not

Table 3. Details of comparative studies (on victimization among people with vs without SMI).

Reference	Design	Country	Gender	SMI population	Control population	SMI n	Control n	Violence type	Crude OR (95% CI)	Adjusted OR (95% CI)	Quality score
Hsu et al. (2009)	CS	Taiwan	Mixed	OP&IP (local)	National CVS data	155	10 487	Any	1.9 (1.0–3.5)	NR	3
Kamperman et al. (2014)	CS	Netherlands	Mixed	OP (local)	National CVS data	956	38 227	Physical	6.1 (4.6–8.1)	4.9 (3.7–6.4)[a]	8
								Sexual	3.5 (2.6–4.7)	3.9 (3.1–5.1)[a]	
Katsikidou et al. (2013)	CS	Europe	Mixed	OP (local)	Relative of general hospital inpatients	150	150	Physical	4.6 (2.3–9.2)	NR	4
								Sexual	2.1 (0.8–5.7)		
Khalifeh, Johnson, et al. (2015)	CS	UK	Mixed	OP (local)	National CVS data	308	22 606	Any	7.7 (6.1–9.7)	2.4 (1.5–3.9)[b]	8
								Sexual	5.5 (3.1–9.9)	2.1 (0.98–4.7)[b]	
Silver (2002)	CS	USA	Mixed	IP (local)	Neighbourhood residents	270	477	Any	2.4 (1.5–3.9)	1.8 (1.0–3.3)[c]	7
Silver et al. (2005)	Cohort	New Zealand	Mixed	Dunedin birth cohort	Dunedin birth cohort	38	562	Physical	5.3 (2.7–10.5)	3.2 (1.5–6.7)[d]	10
								Sexual	16.9 (4.7–61.2)	1.9 (0.6–2.9)[d]	
Sturup et al. (2011)	CS	Europe	Mixed	IP (local)	National CVS data	390	1 170	Any	6.9 (4.7–10.2)	NR	7
Teplin et al. (2005)	CS	USA	Mixed	IP&OP (local)	National CVS data	936	32 449	Any	NR	11.8 (9.9–14.0)[e]	6
								Physical		15.0 (12.5–18.1)[e]	
								Sexual		17.1 (10.6–27.7)[e]	
Tsigebrhan et al. (2014)	CS	Ethiopia	Mixed	OP (local)	OP (local)	200	200	Any	4.0 (1.9–8.3)	2.2 (0.95–5.1)[f]	7
								Sexual	2.5 (0.49–13.2)	NR	

[a]Weighted by demographics (sex, age, ethnicity) and education; matched by region.
[b]Adjusted for demographics (sex, age, ethnicity, marital status), SES (employment, housing tenure), area deprivation.
[c]Adjusted for demographics (sex, age, ethnicity), SES, violence perpetration, area characteristics.
[d]Adjusted for demographics (sex, co-habiting), SES (family SES, education, employment), violence perpetration.
[e]Weighted by demographics (sex, age, ethnicity), income; matched for city.
[f]Adjusted for demographics (sex, age, marital status), SES (education, income, employment), substance misuse.
CS: cross-sectional; CVS: Crime Victimization Survey; NR: not reported.

Table 4. Prevalence of recent domestic violence (partner violence (PV) or family violence (FV)).

Reference, country	SMI *n*	Definition of DV	Time frame (months)	Prevalence in women	Prevalence in men	Prevalence in mixed samples: % (95% CI)
Bengtsson-Tops et al. (2012), Sweden	174 men and women	Physical partner/ family violence	12			PV 4.0 (1.6–8.1) FV 2.9 (0.94–6.6)
Chang et al. (2011), USA	428 men and women	Physical or sexual partner violence	12			PV 10.3 (7.6–13.6)
Katsikidou et al. (2013), Greece	150 men and women	Physical or sexual partner/family violence	12			FV 14.7 (9.4–21.4)
Khalifeh, Moran, et al., 2015, UK	133 women, 170 men	Physical or sexual partner/family violence	12	PV 16.9 (10.8–24.7) FV 15.8 (10.0–23.1)	PV 9.4 (5.2–15.3) FV 6.5 (3.3–11.3)	
McPherson et al. (2007), USA	324 women	Physical or sexual partner violence	12	PV 22.2 (17.8–27.1)		
Morgan et al. (2010), UK	71 women	Physical partner violence	12	PV 15.5 (8.0–26.0)		

Figure 2. Meta-analysis: prevalence of any or physical violence, stratified by gender where data available.
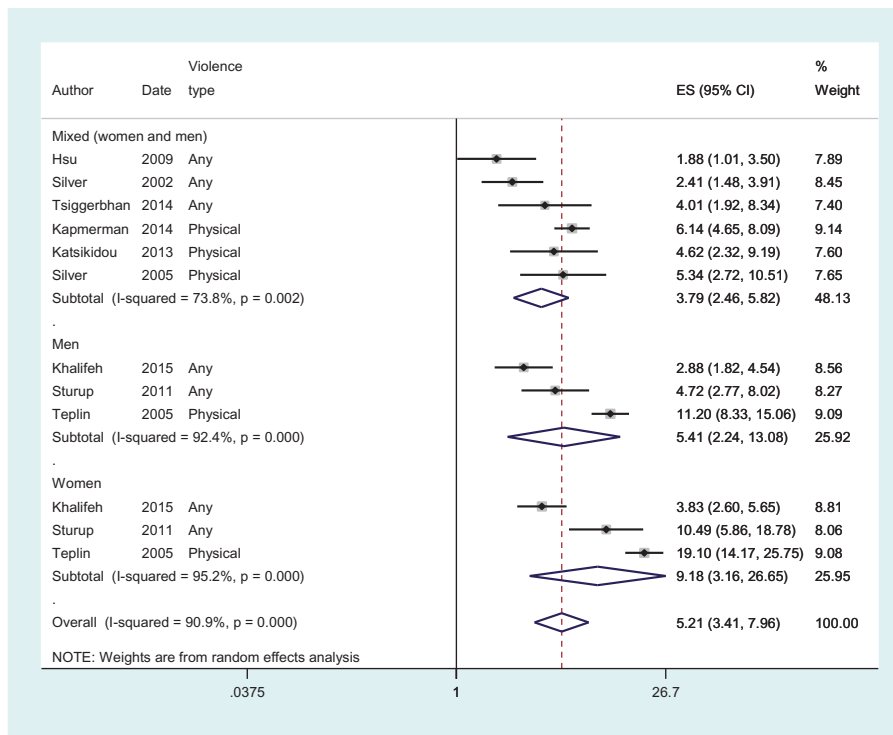
Figure 3. Meta-analysis: crude OR for any or physical victimization in people with compared with those without SMI.
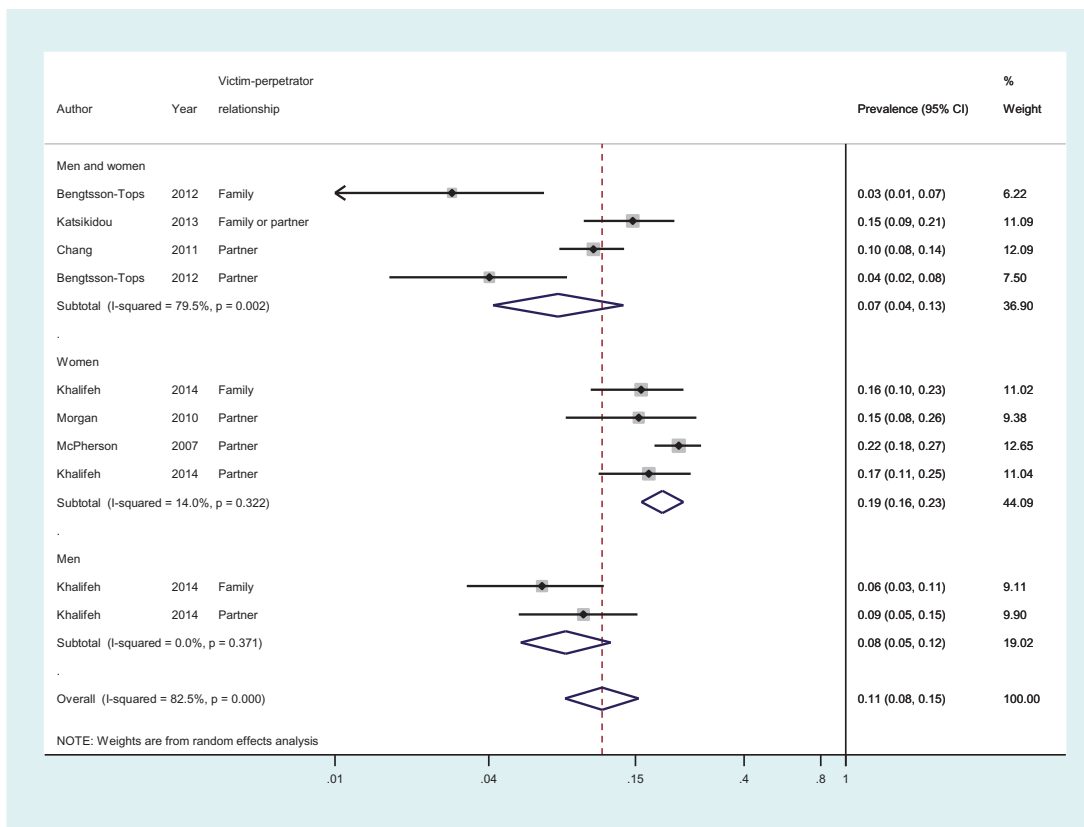

Figure 4. Meta-analysis: prevalence of any or physical domestic violence (perpetrated by partner or family member).
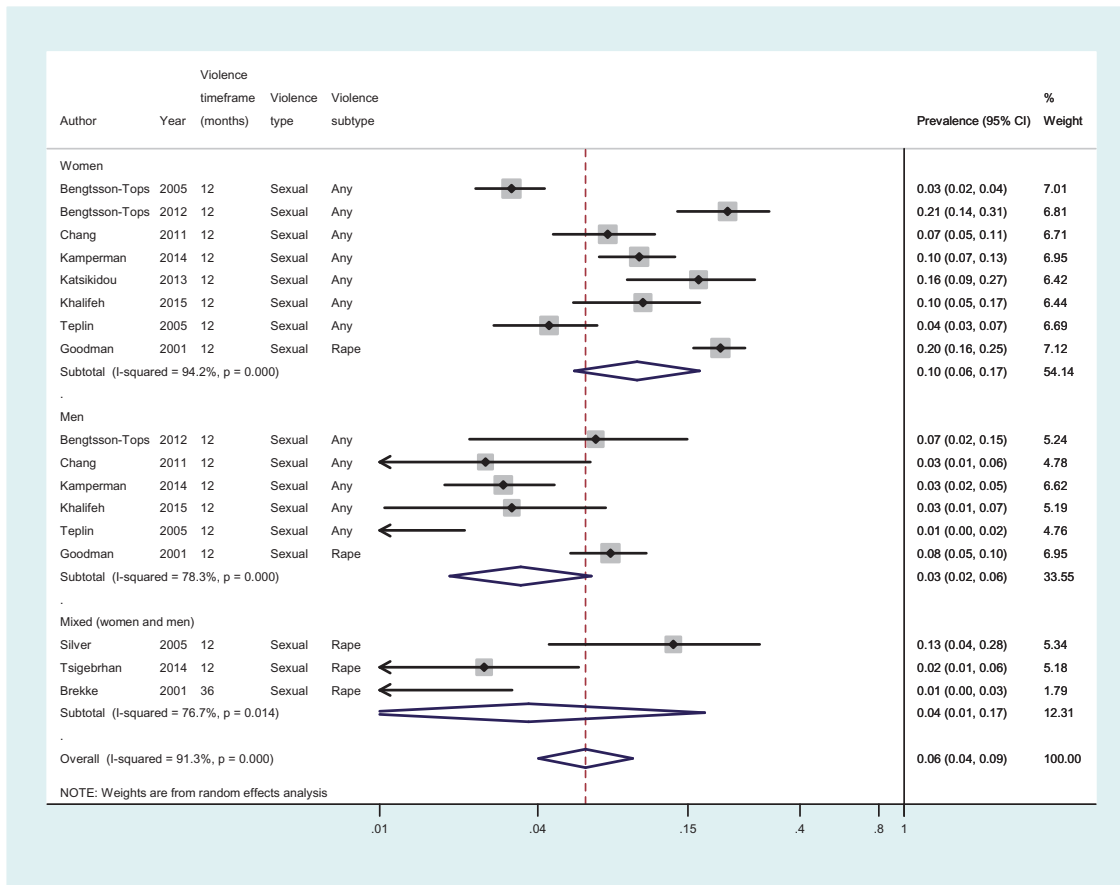
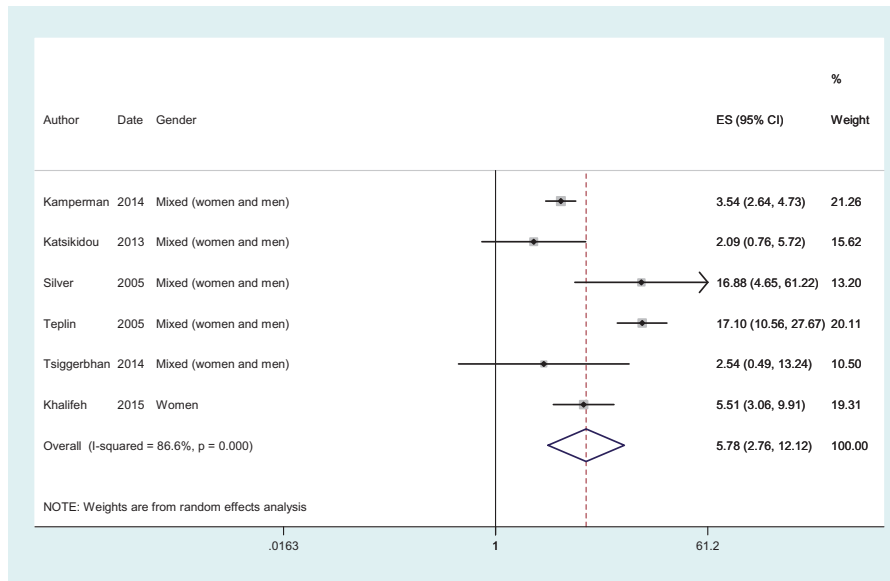**Figure 5.** Meta-analysis: prevalence of sexual violence, stratified by gender where data available.

Figure 6. Meta-analysis: crude OR for sexual victimization in people with compared with those without SMI.

Table 5. Meta-analyses of crude ORs for the association between risk factors and victimization.

Risk domain	n studies	n people with SMI	n victims	Random effects pooled OR (95% CI)	p	I²
Demographic	18					
Sex (F vs M)	16	10 181	1826	1.1 (0.9–1.4)	.31	72
Younger age	5	2313	540	0.98 (0.97–1.0)	.11	77
Ethnic minority	7	4464	838	1.2 (1.0–1.5)	.003	31
Social	11					
Socio-economic[a]	9	4812	923	1.1 (0.81–1.5)	.56	77
Socio-economic: unemployment	6	3487	787	1.0 (0.75–1.4)	.10	62
Social contact[b]	3	1532	433	1.0 (0.5–2.1)	.93	87
Homelessness	10	6381	1219	2.6 (2.1–3.2)	<.001	15
Area of residence (urban vs rural)[c]	2	1001	64	NA	–	–
Substance misuse[d]	8	6302	1151	2.4 (1.8–3.0)	<.001	63
Substance misuse: current	5	2544	352	3.0 (1.7–5.4)	<.001	69
Substance misuse: lifetime	5	5015	1064	2.2 (1.7–2.8)	<.001	61
Violence perpetration (recent)	5	4663	729	4.4 (2.5–7.6)	<.001	84
Clinical	11					
Diagnosis (SZ vs. affective)	7	2335	574	0.94 (0.74–1.2)	.61	28
Co-morbid PD[e]	2	963	173	NA	–	–
Illness severity[f]	7	4981	954	1.7 (1.1–2.5)	<.01	81
Illness severity: admissions history	5	33 878	636	1.5 (0.90–2.5)	.12	85
Symptom cluster[g]	6	2532	496	1.2 (1.0–1.4)	.01	79
Symptom cluster: positive symptoms	3	1570	324	1.0 (0.98–1.1)	.35	0
Childhood abuse[h]	1	782	274	NA	–	–

[a]Socio-economic: includes two studies on educational attainment, one on poverty, and six on unemployment.
[b]Social contact: includes two studies on any social contact and one study on contact with family members.
[c]Urban residence: Two studies reported no association: Hiday reported a crude OR of 1.5 (CI = 0.6–3.6) and Honkonen reported a crude OR of 0.5 (CI = 0.2–1.1).
[d]Substance misuse: includes five studies on lifetime abuse (three any, one drugs, one alcohol) and five studies on current misuse (two any, two drugs, one alcohol).
[e]Co-morbid personality disorder: Dean reported a positive association (crude OR = 6.2, CI = 3.8–10.3), whilst Hiday reported no association (crude OR = 0.4, CI = 0.2–1.0).
[f]Illness severity: includes one study on impaired function, one study on early illness onset and five studies on admission.
[g]Symptoms cluster: includes one study on disorganization, two on manic symptoms, and three on positive symptoms.
[h]Goodman reported positive association with childhood physical abuse (crude OR = 2.8, CI = 2.1–3.9) and childhood sexual abuse (crude OR = 1.9, CI = 1.6–3.5). Morgan reported a 'significant' crude association with childhood abuse, but did not report ORs.
NA, not applicable (meta-analysis not carried out as less than three studies investigated the given risk factor).

associated with age, ethnicity, employment, or hospital admission history.

Discussion

Key findings

The review identified 30 studies on recent violence by any perpetrator against people with severe mental illness (SMI), with a total of 16 140 participants with SMI. However, only six studies reported on recent domestic violence and 11 on recent sexual violence. The median prevalence of recent physical violence by any perpetrator was 20.7% (IQR = 12.6–27.1%), with no difference in odds of victimization by gender (OR = 1.1, CI = 0.9–1.4, p = .31). The prevalence of past-year domestic violence ranged from 15–22% for violence against women, with very limited data on violence against men. The median prevalence of recent sexual violence was 9.9% (IQR = 5.9–18.1%) in women and 3.1% (IQR = 2.5–6.7%) in men; with 3-fold higher odds in women than in men (OR = 3.4, CI = 2.5–4.6, p < .001; I² = 0). When comparing people with SMI vs those without SMI, the odds of physical, sexual, and domestic violence were elevated in all

comparative studies, with a range of 2–22-fold higher odds (with most studies reporting elevated odds of 3–6-fold); with very limited evidence for relative odds of domestic violence. Overall victimization (i.e. regardless of perpetrator) was strongly associated with homelessness (pooled crude OR = 2.6, CI = 2.1–3.2; I² = 15%), substance misuse (pooled crude OR = 2.4, CI = 1.8–3.0, I² = 63%), and violence perpetration (pooled crude OR = 4.4, CI = 2.5–7.6; I² = 84%). There was no association between victimization and demographic factors, socioeconomic status, or diagnosis. There was very limited evidence for risk factors specifically for domestic or sexual violence.

Findings in context of past evidence

This review provides an updated gender-specific synthesis on the prevalence and risk of victimization among people with SMI, and the first quantitative synthesis of risk factors for victimization in this population. The findings of previous related systematic reviews are summarized in Supplementary Table S1. Oram et al. (2013) estimated that a third of women in contact with psychiatric inpatients or outpatients had

a history of adulthood IPV. In this review, we found that around one in five women with SMI experienced recent DV—so the abuse for many patients was ongoing whilst under psychiatric care. Limited evidence suggested that family violence was as common as partner violence, but there was little evidence on its nature or impact. For sexual violence, Hughes et al. (2012) previously estimated that ∼5% of people with any mental illness (including common mental disorder or SMI) experienced recent sexual violence, but did not report prevalence by gender. We estimated that around one in ten women (and 3% of men) with SMI experienced recent sexual violence.

In the general population men are at higher risk of physical violence and women are at much higher risk of sexual and domestic violence (Krug, 2002; World Health Organization, 2013). This review found that men and women with SMI had a similarly high prevalence of physical violence victimization—such that the protective effect of female gender in the general population was lost in the SMI population. Data on domestic violence against men were too limited to allow a gender comparison. For sexual violence, and like in the general population, women with SMI had a higher prevalence of sexual victimization than men with SMI. However, the protective effect of being male was less pronounced in the SMI population than in the general population—with some studies reporting a similar prevalence of sexual violence against men with SMI to that against women in the general population (Khalifeh, Moran, et al., 2015). Overall, people with SMI were at greater risk of both physical and sexual violence than the general population, with a narrowing of the gender gap found in the general population for both types of violence.

The pooled estimate of 5-fold relative odds for any physical violence in people with SMI compared to those without mental illness found in this review is in line with the 4-fold risk reported in the systematic review by Hughes et al. (2012) (which mainly related to people with common mental disorders), and somewhat higher than the 3-fold risk of domestic violence in the review by Trevillion et al. (2012). In all studies the elevated risk persisted after taking into account socio-demographic differences, so this effect is unlikely to be due to confounding.

This review provides the first quantitative synthesis of risk factors for victimization among people with SMI. Due to the lack of primary data, however, it was not possible to consider risk factors separately by gender or by type of violence, and the extent to which risk factors are relevant to violence experienced by

both men and women and for domestic and sexual violence is unclear. The odds of any victimization were 4-fold higher among those with a history of violence perpetration, 3-fold higher among those with a history of substance misuse or homelessness, and 2-fold higher among those with greater illness severity. This reflects the findings by Maniglio (2009), who identified the same key risk factors, but did not quantify their effects. The finding that violence perpetration and substance misuse are key risk factors for being a victim is not surprising. There are well-established links between victimization and perpetration in the general population and among people with SMI, although their relevance to women's experiences of domestic and sexual violence are less well understood (Hiday, Swanson, Swartz, Borum, Wagner, Hiday, et al., 2001; Krug, 2002; Silver, Piquero, Jennings, Piquero, & Leiber, 2011). A recent systematic review on violence perpetration by people with psychosis found that being a victim of violence was associated with 6-fold higher odds of being a perpetrator (Witt et al., 2013). Several mechanisms have been suggested to explain this association, some of which apply to those without mental illness; for example, living in socially deprived neighbourhoods, where social and economic conditions foster violence norms (Sampson & Groves, 1989) or involvement in a violent sub-culture, especially one involving drug misuse (Goldstein, 1985; Krug, 2002; Sampson, Morenoff, & Gannon-Rowley, 2002). Other proposed mechanisms are specific to mental illness, for example acutely ill patients displaying disturbed or psychotic behaviour, which may evoke hostile reactions and attempts at social control from others, leading in turn to conflict and mutual violence (Silver, 2002). However, in this review there was greater support for risk factors shared with the general population than for illness-specific factors. In contrast to the strong associations found with substance misuse, homelessness and violence perpetration, diagnosis and positive symptoms were not associated with the risk of victimization.

Interestingly, key factors which are associated with victimization in the general population, such as gender, age, and social deprivation, were not associated with victimization in the SMI population. In the general population, young men are at highest risk of physical violence, in part due to lifestyle and socialization with delinquent peers (Krug, 2002). The risk decreases with age as men acquire employment and move to independent living with family responsibilities (Coid & Yang, 2010). Therefore, older age and employment are protective. It could be argued that

the lack of meaningful social roles and social integration for the majority of people with SMI could leave them vulnerable to victimization, regardless of age or gender.

Only two of the included studies assessed childhood abuse, and both found an association with victimization risk. In the general population childhood abuse is associated with greater victimization risk in adulthood (Coid et al., 2001; Widom, Czaja, & Dutton, 2008). People with SMI have high rates of childhood abuse (Varese et al., 2012), and this may be an important risk factor in their vulnerability to violence as adults. There is a need for greater understanding of the mechanisms linking early abuse to later vulnerability; which are likely to include long-term effects of insecure attachment, poor self-esteem, and inter-personal difficulties in forming trusting relationships, setting boundaries, and managing conflict (Fonagy, 2003). These mechanisms are likely to be present in any victims of childhood abuse, but those who develop SMI have additional challenges in forming and maintaining supportive relationships, due to the direct and indirect effects of their illness (Thornicroft, Brohan, Rose, Sartorius, & Leese, 2009). This may compound the psychological and social effects of childhood abuse.

Whether the above findings are specifically applicable to DV is uncertain. DV advocates and mental health service users, however, have long been critical of 'biomedical' treatment models that emphasize diagnosis and individualize what is a social problem (Humphreys & Thiara, 2003; Trevillion et al., 2014). Echoing this, the review findings suggest that treatment approaches that focus only on psychiatric symptoms are likely to be insufficient in reducing risk of violent victimization. We found that there was very limited evidence on risk factors specifically for domestic or sexual violence against people with SMI. In the general population, factors associated with domestic or sexual victimization include younger age, witnessing DV as a child, substance misuse, poverty, and childhood sexual abuse (Krug, 2002). These factors are more prevalent among people with SMI and may in part account for the excess risk. The evidence reviewed here suggests that illness severity and substance misuse are important correlates; these factors could both precede and follow victimization. A more recent study found a strong association between childhood abuse and adulthood domestic and sexual violence among both men and women with SMI—with emotional childhood abuse having particularly strong associations with adulthood victimization (Anderson,

Howard, Dean, Moran, & Khalifeh, 2016). However, aetiological factors also occur at the level of the relationship (e.g. having a partner who misuses substances or who was a victim of childhood abuse), community (e.g. high population density, unemployment, and social isolation), and society or culture (e.g. gender and social inequalities, and health, economic, and social policies) (Krug, 2002; Oram, Khalifeh, & Howard, 2016) There was a lack of evidence on risk factors operating at these levels, but they are likely to be key in this population.

The findings highlight the importance of improving mental health service responses to domestic, sexual, and other forms of violence victimization. Mental health professionals are accustomed to assessing what risk their patients pose to others, but are less practiced in asking about patients *experiences* of violence; it is estimated that only 10–30% of cases of domestic violence are identified and that sexual violence is similarly under-detected (Chapman & Monk, 2015; Howard et al., 2010; Oram et al., 2016) Several countries now require that mental health professionals routinely enquire about violence victimization (Agar & Read, 2002; Department of Health, 2010; Eilenberg, Fullilove, Goldman, & Mellman, 1996). In order to do so safely, mental health professionals should be trained in identifying and responding to violence victimization, including awareness of the increased risk of being a victim of violence compared to the general population and of the gender differences in the types of violence experienced. Clear referral pathways to specialist support and advice for people who have experienced violence should be implemented. However, efforts to improve the identification and response to violent victimization among mental health service users, including the refinement of risk assessments and implementation of prevention strategies, would benefit from research to elucidate whether and how risk factors differ for men and women and for different forms of abuse.

Strengths and limitations

Strengths of this review include a gender-specific focus (lacking in previous reviews), new quantitative synthesis of evidence on risk factors and rigorous evaluation of study quality, and potential sources of heterogeneity. Due to time and resource limitations, the literature search was conducted for studies published over a limited time period, with identification of earlier studies relying on published systematic reviews. Therefore, it is possible that some earlier studies may have been missed. This is likely to be

mitigated by screening of reference lists from more recent studies. Authors and experts were not contacted. The review only included studies published in English, so may have missed some relevant studies published in other languages. The study settings, populations, and methods were highly varied. In this review SMI was defined as having either a psychotic illness or being under the care of psychiatric services. This was in part a pragmatic choice, based on the populations included in the relevant published studies. The definition is potentially problematic, as those under the care of secondary services might well include patients with a range of non-psychotic disorders, but there is no widely agreed definition of SMI, with inconsistency in whether SMI is restricted to certain diagnoses or is defined by illness severity, functional impairment, and the need for secondary care (Charlwood, Mason, Goldacre, Cleary, & Wilkinson, 1999). The pooled prevalence estimates had high levels of statistical heterogeneity, where the findings from individual studies were more different from each other than would be expected by chance. Therefore, the pooled prevalence estimates may not be a valid summary of individual study findings, and the individual study estimates need to be inspected. Although a broad range of potential sources of heterogeneity were explored (related to study setting, design, methods, and quality), none explained the heterogeneity in violence prevalence estimates. This might be either because the true prevalence varies across settings and populations, or because there were multiple differences in design, methods, and quality across studies that could not be adequately accounted for in the heterogeneity analyses. The risk factor meta-analyses had little or moderate heterogeneity, so these meta-analyses have greater validity.

The quality of many included studies was limited by non-random recruitment, low response rates, and brief, poorly validated violence measures. Many had a primary focus other than victimization, with victimization included in a battery of measures on quality-of-life, or investigated as a risk factor for violence perpetration. None of the studies reported correlates of sexual violence only; but rather reported risk factors for either physical violence only, or physical and sexual violence combined. Therefore, it was not possible to compare risk factors for physical and sexual violence. Future research should acknowledge domestic, sexual, and other forms of violence as public mental health problems and seek to understand risk pathways for different types of violence at the individual, inter-personal, community, and societal levels, within a lifespan or developmental framework. Given the high burden and excess risk of victimization among people with SMI, future research should evaluate complex interventions for improving detection of and response to victimization experiences within mental health services.

Conclusion

The review synthesized evidence from 30 studies and found that around a fifth of people with severe mental illness had experienced recent violence, regardless of their age, gender, socio-economic position, or diagnosis. More limited evidence suggested that 15–20% of women with SMI experienced recent domestic violence (with a similar burden of partner and family violence) and one in 10 experienced recent sexual violence. Men and women with SMI were at higher risk of physical and sexual violence than the general population, with a narrowing of the gender gap. Many of the risk factors for victimization among people with SMI were shared with the general population rather than being illness-specific, and included violence perpetration, substance misuse, and homelessness. There was a lack of evidence on risk factors specifically for domestic and sexual violence, and on the extent of domestic and sexual violence against men with SMI. Future studies should address these evidence gaps, in order to guide clinical practice and policy on gender-sensitive violence prevention measures in this group.

Disclosure statement

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