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Systematic Review and Meta-analysis: Rates of Violence During First-Episode Psychosis (FEP)

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Background: Most people with psychotic disorders will never commit an act of violence. However, the risk of violence committed by people with schizophrenia is higher than the general population. Violence risk is also known to be highest during the first episode of psychosis compared to later stages of illness. Despite this, there have been no comprehensive reviews conducted in the past 10 years examining rates of violence during FEP. We aimed to provide an updated review of the rate of violence in people with FEP. **Study Design:** Meta-analytical techniques were used to identify pooled proportions of violence according to severity (less serious, serious, severe) and timing of violence (before presentation, at first presentation, after presentation to services). **Study Results:** Twenty-two studies were included. The pooled prevalence was 13.4% (95% CI [9.0%–19.5%]) for any violence, 16.3% (95% CI [9.1%–27.4%]) for less serious violence, 9.7% (95% CI [5.4%–17.0%]) for serious violence and 2.7% for severe violence, regardless of time point. The pooled prevalence of any violence was 11.6% (95% CI [6.8%–18.9%]) before presentation, 20.8% (95% CI [9.8%–38.7%]) at first presentation and 13.3% (95% CI [7.3%–23.0%]) after presentation to services. **Conclusion:** Overall, rates of violence appear to be lower in more recent years. However, due to the high between-study heterogeneity related to study design, the findings must be interpreted with consideration of sample characteristics and other contextual factors. The prevalence of violence remained high at all-time points, suggesting that more targeted, holistic, and early interventions are needed for clinical FEP groups.

Key words: violence/first-episode psychosis/early psychosis/schizophrenia/pooled prevalence/specialized early intervention

Introduction

Violence typically refers to behavior involving physical force towards other people and is often categorized based on severity, such as less serious, serious, and severe violence, within the psychosis literature.¹ Violence is also measured using different methods, such as self-reports and patient interviews; however, there are notable inconsistencies across studies.^{2,3} The general community, media, and governments often assume that individuals with severe mental illnesses such as psychotic disorder (eg, schizophrenia) and bipolar disorder are more likely to commit violence.⁴ Past reviews have also identified a higher incidence of violence in people with schizophrenia spectrum,⁴ personality and substance use disorders, compared to other psychiatric illnesses.⁵ Although most people with psychotic disorders will never commit violence, the risk of violence committed by people with schizophrenia is up to four to six times higher than the general population.^{6–9} Compared to later and more chronic stages of illness, the risk of violence perpetration is usually highest during the first episode of psychosis (FEP; up to 20-fold), with rates of any type of violence between 35% and 39% during this early illness phase.^{1,10} People experiencing FEP are considered an important group for early intervention, due to risks of poor long-term clinical and functional outcomes, especially if there is a history of violence-related incarceration.^{11–13}

Access to appropriate psychiatric care may be one reason for the decline in violence over the course of psychosis.^{8,10} One systematic review⁸ compared rates of homicide before and after treatment, and found that the annual rate of homicide was 15.5 times greater in people with FEP not treated for psychosis, compared to those who were treated. Similarly, one longitudinal study reported that after treatment initiation (antipsychotic medication or hospitalization to manage severe psychotic symptoms), up to 10 years since first entry to services, the rates of violence in people with FEP reduced to a level similar to that seen in the general population.¹⁴ While these findings highlight the potential effects of treatment in reducing the incidence of violence, they also suggest that the early stage of illness (ie, FEP), particularly before appropriate treatment initiation (ie, duration of untreated psychosis [DUP], which refers to the period between the onset of psychotic symptoms and start of treatment),^{7,15,16} is a time of vulnerability for violence perpetration.

Despite the incidence of violence being highest during FEP, there are very few recent reviews examining violence specifically during this early stage, with most including studies published between 1992 and 2011.^{1,7,10,17} Further, most studies only report the overall rate of violence, and the prevalence of different severities of violence (eg, less serious, serious, severe) are inconsistently reported. Consequently, the current rates of violence are unclear, and an updated review is needed. Although we aimed to conduct an updated review of the past 10 years, a broader time frame of 20 years was selected to capture the expansion of specialist early intervention (SEI) services for psychosis, which have been more broadly implemented over the past two decades.^{18,19} Systematic review and meta-analysis techniques were used to address the following question: “what are the rates of violence, according to severity, in people with FEP in more recent years (i.e., past 20 years)?”

Methods

Protocol Registration

This study was pre-registered with the International Prospective Register of Systematic Reviews (PROSPERO; registration number: CRD42021277673) on 8 October 2021.

Search Strategy

The initial search strategy was developed by analysing the title and abstract of 22 relevant studies,^{11,14,20–39} which were identified via Google Scholar. Four search plans (see [Supplementary tables 1–4](#)) were used to identify studies in MEDLINE, Embase, PsycINFO, and CINAHL. The search was limited to studies in English published between 2000 and 2023 (inclusive). All searches were

conducted on February 4, 2023. Additionally, the reference lists of relevant reviews were hand searched for additional articles.

Definition of Violence

Violence was defined as physical violence perpetrated towards other people, as measured by and/or classified using any method (eg, self-reports, interviews, police records). Studies referring to verbal aggression, violent victimization, and violence towards objects and the self (eg, suicide, self-harm) were excluded.

Violence was further grouped according to severity, based on definitions from Large and Nielssen,¹ to allow for comparisons with existing reviews: (1) less serious violence (physical violence against other people not causing injury and without weapon use); (2) serious violence (physical violence causing any degree of injury with or without weapon use or any sexual assault); (3) severe violence (physical violence towards others resulting in serious injury requiring treatment in hospital or permanent physical harm); and (4) any violence (any form of physical violence perpetrated towards other people). The term “any violence” was used when the severity of violence was not specified.

Inclusion Criteria

Participants Studies were included if participants had a diagnosis of FEP of any non-affective (schizophrenia, schizophreniform disorder, brief psychotic disorder, delusional disorder) or affective psychotic disorder (bipolar disorder, schizoaffective disorder, major depressive disorder with psychotic features), or psychotic disorder not otherwise specified (NOS). As recommended by a previous review,⁴⁰ FEP was defined broadly as the early stage of psychotic illness, not necessarily the first “episode” of psychosis. Although it has been recommended to define FEP based on duration of illness (typically around 2–5 years from first diagnosis), we did not include restrictions around the period of illness to ensure that relevant studies were not excluded. Studies were excluded if they: (1) did not specify whether participants were experiencing FEP or early psychosis; (2) did not use a well-validated diagnostic tool (eg, Diagnostic and Statistical Manual of Mental Disorders [DSM], International Classification of Diseases [ICD]); (3) did not specify method of diagnosis; and/or (4) only included forensic samples (eg, prison populations). Although the age of onset for FEP is typically during adolescence and early adulthood between 15 and 30 years,⁴¹ as FEP can occur at any age,⁴² there was no limitation on the age of participants. Diagnoses such as bipolar disorder were included to allow for greater generalizability, and to be more inclusive of samples given bipolar disorder and manic symptoms are often overlooked in existing violence and FEP literature.⁴³

Violence Studies were included if the prevalence of violence was reported (% or *n*). There was no time limit on when the violence was committed (eg, at presentation, before or after first entry to service). Studies only examining aggression were included if aggression included physical violence towards others. Similar to existing reviews (eg, Large and Nielssen¹), studies were excluded if they claimed to assess verbal aggression or violence towards the self or objects only, and not in addition to physical violence towards other people. Studies were excluded if they claimed to assess violence but did not specify whether this included violence towards other people.

Procedure

The Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) guidelines were used for the guide screening and selection of studies as well as reporting of findings.⁴⁴

Study Selection During the first stage, two researchers (SY and SM) independently screened titles and abstracts of studies, using broad inclusion criteria. Studies were selected if: (1) participants were diagnosed with FEP of any psychotic disorder; and (2) violence or aggression was assessed. Studies were still included if FEP status was not specified. In the next stage, full-text articles were screened by SY and SM according to the full inclusion criteria above. Lastly, studies with overlapping samples were identified and excluded if the study was: (1) not the original study (ie, later publication year) or (2) included limited information about measurement, definition, or classification of violence compared to the original study. Screening was conducted via Covidence (Covidence Systematic Review Software), and all conflicts were resolved via discussion.

Data Extraction The following variables were extracted independently by SY and SM: author; year of publication; title; country; recruitment method; recruitment period; sample size; sample demographics (age, gender); diagnostic method; method of classification, measurement, or definition of violence; timing of violence; rate and proportion of violence. For studies that reported separate rates for violence towards others, self, and/or objects, only the rate of violence towards others was included. If studies did not include specific rates for violence towards others, but reported an overall rate of unspecified violence, the latter was included.

Quality Appraisal of Studies

The methodological quality of studies was assessed by SY and SM using an adapted version of the Joanna Briggs Institute (JBI) Critical Appraisal Checklist for Studies

Reporting Prevalence Data (see [Supplementary table 5](#)). This is 9 item scale pertaining to quality of methodologies used in a study. A response of “yes,” “no,” or “unsure” was given for each item. “Yes” responses were scored “1” whilst “no” and “unsure” responses were scored “0.”

Statistical Analysis

Statistical analyses were conducted using R Version 4.1.1 (R Core Team, 2020). The *metaprop* function was used to calculate pooled proportions of violence, according to severity: less serious violence, serious violence, severe violence, and any violence. When calculating the pooled proportions of violence, non-independent samples were excluded. To do this, when studies reported rates of violence across multiple timepoints for all types of violence (ie, any, less serious, serious, severe violence), only the rate of violence at one timepoint (at presentation or the earliest timepoint) was included for each single analysis.

Additional pooled proportions were calculated for any violence at different timepoints, regardless of severity: before presentation (at least 3 months or unspecified period before presentation to services), at first presentation (“baseline” or less than 3 months before or after first presentation to services), and after presentation to services (at least 3 months since treatment initiation). For these analyses, studies were excluded if they did not specify the timepoint at which violence was committed. Due to the small number of studies, this timepoint was not separated into additional subgroups (eg, 1-year follow-up, 2-year follow-up). Considerable between-study heterogeneity was expected due to differences in variables such as age, sociodemographic factors, definition, measurement, and timing of violence across studies. Given this, a random-effects model was chosen a priori to calculate pooled proportions. Heterogeneity of studies was assessed using Cochran’s *Q* and *I*² statistic. *I*² values greater than 75% indicated very high heterogeneity.⁴⁵ Publication bias was assessed using Egger’s test and P-Curve analysis, unless between-study heterogeneity was high (*I*² > 75%), as the results are considered non-acceptable.⁴⁶

Sensitivity analyses were conducted using subgroup analyses (*update.meta* function) to compare pooled proportions of violence between timepoints (before presentation, at first presentation, after presentation to service). Meta-regression analyses (*metareg* function) were also conducted to compare rates of violence according to publication year.

Results

Search Results

A total of 3680 studies were identified via database search and through hand searching reference lists of relevant

studies. Following the removal of 1543 duplicates, 1967 studies were determined as not relevant based on title and abstract screening, and an additional 161 studies were excluded following full-text screening. This led to the inclusion of 22 studies (see figure 1 for PRISMA flowchart). Table 1 outlines relevant study details for included studies. There was a total of 8284 participants across studies (M sample size = 376.5, SD = 576.1), with the percentage of males ranging between 51.4%³⁹ and 85.5%,⁴⁷ and mean age ranging between 18.5²⁶ and 33.3 years.³⁰ FEP diagnoses were generally broad and included all psychotic disorders (eg, schizophrenia, schizoaffective disorder) or mood disorders (eg, bipolar disorder, major depressive disorder) with psychotic features, usually based on the DSM-IV and ICD-10 criteria. A majority of studies included samples from both inpatient and general community outpatient services,^{22,25–28,32,47,48} inpatient and SEI outpatient services,^{30,36}

SEI outpatient services for FEP only,^{11,14,39,49,50} hospital inpatient services only,^{12,43,51–54} and community outpatient mental health services only.²¹ Most studies were conducted in the United Kingdom (22.7%) and United States (18.2%). Approximately 17 disagreements were identified and all were resolved through discussion. See figure 1 for a flowchart with the number of studies screened, excluded, and included for analysis, with reasons for exclusion.

Definition, Measurement, and Classification of Violence

Studies varied greatly with respect to operationalizations of violence (including the method of assessment, definition, and timing of violence; see table 2). Violence was usually defined broadly, and at times, based on definitions from previous studies, dictionaries, or standardized assessment tools (eg, Psychiatric and Personal History

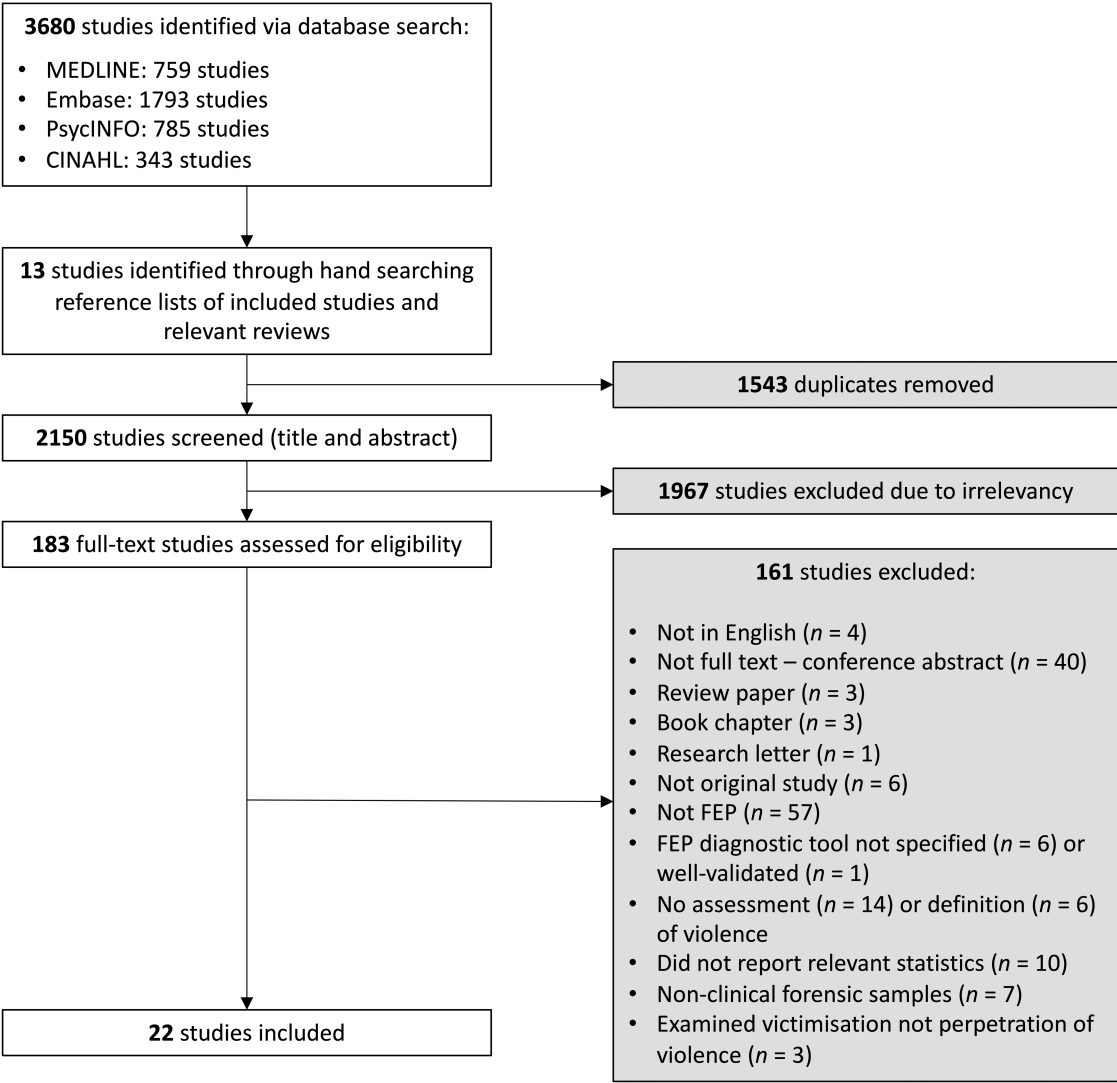


Fig. 1. PRISMA flowchart.

Table 1. Study Details, Demographic Information, Diagnostic Details, and Quality Scores of 28 Studies

Study	Country	<i>n</i>	Mean Age (<i>SD</i>)	Male <i>n</i>	Diagnosis	Diagnostic Method	Quality Score
Björkenstam et al. (2014)	Sweden	2819	22.6 (3.6)	1632	FEP of schizophrenia spectrum disorders and affective psychosis	ICD-9, ICD-10	5
Chang et al. (2015)	China	700	21.2 (3.4)	360	FEP of schizophrenia spectrum disorders and affective psychosis	ICD-10	6
Coid et al. (2013)	United Kingdom	458	30.7 (10.1)	280	FEP of schizophrenia spectrum disorders and affective psychosis	DSM-IV	6
Crebbin et al. (2009)	United Kingdom	62	NR	53	FEP of schizophrenia, drug induced psychosis	ICD-10	2
Dean et al. (2007)	United Kingdom	495	30.8 (10.8)	287	FEP of schizophrenia, mania, and major depressive disorder with psychotic features	ICD-10	5
Fekih-Romdhane et al. (2022)	Tunisia	55	27.2 (5.8)	29	FEP of schizophrenia spectrum disorders	DSM-5	2
Foley et al. (2005)	Ireland	157	28.2 (12.2)	87	FEP of schizophrenia spectrum disorders and affective psychosis	DSM-III	5
Harris et al. (2010)	Australia	85	18.5 (3.2)	NR	FEP of schizophrenia spectrum disorders and affective psychosis	DSM-IV, ICD-10	5
Hodgins et al. (2011)	United Kingdom	301	NR	168	FEP of schizophrenia, bipolar disorder, major depressive disorder with psychotic features	ICD-10	5
Huber et al. (2016)	Germany	52	20.7 (4.4)	38	FEP of schizophrenia spectrum disorders and affective psychosis	DSM-IV	3
Keane et al. (2019)	Ireland	132	33.3 (11.7)	70	FEP of schizophrenia spectrum disorders and affective psychosis	DSM-IV	4
Khalsa et al. (2018)	United States	216	31.2 (13.1)	117	FEP of bipolar disorder I	DSM-IV	2
Langeveld et al. (2014)	Norway and Denmark	178	NR	NR	FEP of schizophrenia spectrum disorders and affective psychosis	DSM-IV	3
Lopez-Garcia et al. (2019)	United States	449	19.6 (4.2)	330	FEP of schizophrenia spectrum disorders and affective psychosis	DSM-IV, K-SADS	4
Marion-Veyron et al. (2015)	Australia	647	21.3 (3.6)	425	FEP of schizophrenia spectrum disorders and affective psychosis	DSM-IV	4
Milton et al. (2001)	United Kingdom	166	NR	98	FEP of schizophrenia spectrum disorders and affective psychosis	ICD-10	3
Moulin et al. (2019)	Switzerland	265	23.9 (4.8)	171	FEP of schizophrenia and other psychotic disorders ⁴	DSM-IV	5
Ramsay et al. (2011)	United States	109	23.1 (4.7)	83	FEP of schizophrenia spectrum disorders	DSM-IV	1
Ramsay Wan et al. (2014)	United States	191	24.2 (4.8)	139	FEP of schizophrenia spectrum disorders	DSM-IV	1
Salvatore et al. (2021)	United States	329	31.6 (NR)	NR	FEP of schizoaffective disorder, affective psychosis	DSM-5	2
Verma et al. (2002)	Singapore	272	NR	160	FEP of schizophrenia or schizophreniform disorder	DSM-IV	3
Verma et al. (2005)	Singapore	146	28.7 (6.5)	77	FEP of schizophrenia spectrum disorders and affective psychosis	DSM-IV	5

Note: NR, not reported; schizophrenia spectrum disorders typically include schizophrenia, schizoaffective disorder, schizophreniform disorder, delusional disorder, brief psychotic disorder, psychosis not otherwise specified (NOS); affective psychosis typically includes manic episode or bipolar disorder with psychotic features, major depressive disorder with psychotic features, mood disorder with psychotic features NOS; maximum quality score = 7; DSM, Diagnostic and Statistical Manual of Mental Disorders; ICD, International Classification of Diseases; K-SADS, Kiddie Schedule for Affective Disorders and Schizophrenia.

Schedule [PPHS], Modified Overt Aggression Scale [MOAS]). The terms aggression and violence were often used interchangeably, and violence was frequently considered a subcategory of aggression (eg, serious aggression only).^{17,32}

Various methods were used to *measure* violence. The most commonly used methods were case notes,^{11,22,30,53}

medical records,^{14,22,25,32,43,47–49,53} self-reports,^{28,50} and patient interviews,^{12,14,21,22,26,32,36,39,43,48,49,52–55} which included questions (eg, “during the last year, have you ever exposed other people to your aggression through verbal or physical threats, non-severe physical violence, or serious physical violence?”) and standardized assessments (eg, MOAS). Commonly used standardized

Table 2. Study Information Related to Violence for 28 Studies

Study	Method of Measurement	Standardized Assessment Tool/s	Definition and/or Classification	Timing
Björkenstam et al. (2014)	Crime registers	NR	Violent crime (ie, serious or severe violence) defined as “homicide, assault, robbery, arson, sexual offense (rape, sexual coercion, child molestation, indecent exposure, or sexual harassment), illegal threats or intimidation”.	NR
Chang et al. (2015)	Patient and informant interviews, medical records, police records	NR	Violent behavior defined as “an act involving use of physical force which is intended to hurt or injure another person”. Serious violence defined as “assault resulting in injury or involving use of a weapon, threat with a weapon or sexual assault.” Other violence (ie, less serious violence) defined as “assault without injury or weapon use.” Definitions based on MacArthur Violence Risk Assessment Study ⁵⁷	Before presentation (unspecified period before entry to service), after presentation (3-year follow-up)
Coid et al. (2013)	Patient interviews	MacArthur Community Violence Interview	Minor violence (ie, less serious violence) defined as “simple assault without injury or weapon use.” Serious violence defined as “assault resulting in injury or involving use of a lethal weapon, threat with a lethal weapon, or sexual assault”	Before presentation (past 12 months)
Crebbin et al. (2009)	Medical records	NR	Violence defined as “physical harm towards others”	At presentation (unspecified)
Dean et al. (2007)	Patient and informant interviews, medical records	Psychiatric and Personal History Schedule (PPHS)	Violence defined as “physical assault, threat with a weapon, arson, or other extensive property damage”	Before presentation (unspecified), at presentation (unspecified)
Fekih-Romdhane et al. (2022)	Patient interviews	NR	Violent offences defined as any crime against persons	Before presentation (unspecified)
Foley et al. (2005)	Medical records, incident reports	Modified Overt Aggression Scale (MOAS)	Violence defined as “the exercise or an instance of physical force” towards other people, themselves or property. Definition based on the Collins English Dictionary and Thesaurus.	At presentation (week prior to and after presentation with FEP)
Harris et al. (2010)	Patient and informant interviews	Aggressive Behaviour Questionnaire (ABQ)	Serious aggression (ie, serious violence) defined as “physical aggression against another person, using a weapon or committing a sexual assault.” Definitions based on MacArthur Violence Risk Assessment Study ⁵⁷	Before presentation (past 3 months)
Hodgins et al. (2011)	Official police records	NR	Violent offences defined as “violence against the person, sexual offences and robbery”	Before presentation (prior to onset of FEP)
Huber et al. (2016)	Self-reports	Early Psychosis File Questionnaire (EPFQ)	Forensic history (ie, any violence) defined as any contact with legal system for any conviction ⁴	Before presentation (unspecified)
Keane et al. (2019)	Medical records	Modified Overt Aggression Scale (MOAS)	Violence defined as “exercise or an instance of physical force” and classified into two groups: serious violence defined as “assault resulting in injury, any use of a weapon or any sexual assault.” Also included any other violence. Definitions based on MacArthur Violence Risk Assessment Study ⁵⁷	At presentation (week prior to and after presentation with FEP)
Khalsa et al. (2018)	Patient interviews, medical records	NR	Serious physical aggression (ie, serious violence) defined as “assault with homicidal ideation and behaviours, attempted homicide”	After presentation (4 weeks since presentation)
Langeveld et al. (2014)	Patient interviews, medical records	NR	Less serious violence defined as “verbal or physical threats, or physical violence against objects or assault not causing physical harm.” Serious violence defined as “assault causing some degree of injury, any use of a weapon, or any sexual assault” ¹¹	After presentation (10-year follow-up)
Lopez-Garcia et al. (2019)	Patient interviews, informant reports, medical records	Modified Overt Aggression Scale (MOAS)	Physical aggression (ie, less serious violence) defined as “pushing others, shaking others, hitting, kicking, scratching, and pinning down.” Physical aggression with threat or injury (ie, serious violence) defined as “physical aggression with threat of injury—hitting and kicking people with threat to do more, suicide attempts, causing injury, potentially or actually lethal”	Before presentation (unspecified)

Table 2. Continued

Study	Method of Measurement	Standardized Assessment Tool/s	Definition and/or Classification	Timing
Marion-Veyron et al. (2015)	Medical and official records	NR	Violence-related offences defined as those against persons (physical aggression), and sexual offenses (sexual abuse of another person)	Before presentation (unspecified forensic history)
Milton et al. (2001)	Patient interviews, informant reports, medical, forensic, and legal records	MacArthur Community Violence Instrument, Psychiatric and Personal History Schedule (PPHS)	Serious aggression (ie, serious violence) defined as “weapon use or threat, sexual assault, or any other violence with injury to a victim.” Lesser aggression (ie, less serious violence) included all other acts	Before presentation (before onset of FEP), after presentation (3-year follow-up)
Moulin et al. (2019)	Self-reports, informant reports, forensic reports	Staff Observation Aggression Scale, Revised (SOAS-R)	Serious violence defined as “assault causing any degree of injury, any use of a weapon or any sexual assault.” The term any violence was used when the severity of the violence was not specified	Before presentation (unspecified), after presentation (3-year follow-up)
Ramsay et al. (2011)	Patient interviews	NR	Violence defined as “assault or battery/fighting, domestic violence/child abuse”	At presentation (unspecified)
Ramsay Wan et al. (2014)	Patient interviews	NR	Violence defined as “assault, robbery, arson, any sexual offence, illegal threats, intimidation”	Before presentation (during DUP)
Salvatore et al. (2021)	Patient and informant interviews, medical records	NR	Homicidal behavior (ie, severe violence) defined as “violent assault toward another person with plan/intent to kill” ^b	Before presentation (prodromal)
Verma et al. (2002)	NR	NR	Violence classified as binary variable (yes/no). Violence defined as “physical assault, sexual assault, destruction of property, threatening behaviour”	NR
Verma et al. (2005)	Patient and informant reviews, official police records	MacArthur Community Violence Instrument	Serious aggression (ie, serious violence) defined as “weapon use or threat, sexual assault, or any other violent act with injury to a victim.” All other acts of aggression (ie, less serious violence or any violence) included ones of lesser aggression	Before presentation (unspecified)

Note. NR, not reported.

^aOnly violence-related convictions were included for the study.

^bThis study only assessed rates of homicide, not overall violence; FEP, first-episode psychosis; DUP, duration of untreated psychosis.

measures included the Modified Overt Aggression Scale (MOAS),⁵⁶ the MacArthur Community Violence Instrument (MCVI),⁵⁷ and the Psychiatric and Personal History Schedule (PPHS).⁵⁸ Overall, there were inconsistencies in the type of behavior that was measured (see [Supplementary table 6](#)). Most instruments (eg, ABQ, LHA, MOAS, PPHS, SOAS-R) assessed for a wide range of behaviors including verbal aggression, violence towards self, others, and objects. Other measures focused on physical violence towards others only (eg, MCVI) or past forensic history (eg, EPFQ). Occasionally, studies did not include subscales that were deemed irrelevant to their study (eg, suicide and self-harm).⁵⁹ Incidents of violence and aggression were usually rated on a Likert or dichotomous scale (yes/no), and the frequency of behaviors were occasionally reported.

In terms of *classification*, violence was usually grouped based on severity level and timing of violence. Several studies categorized violence into “any” and “serious” violence and had definitions similar to those of the current review. However, the time periods were highly varied. The timepoint before treatment (ie, “before presentation to

services”) ranged from an undefined period^{11,12,27,36,39,53,54} to 3 months before treatment initiation,²⁶ and the follow-up period (ie, “after presentation to services”) ranged between 4 weeks⁴³ and 10 years¹⁴ following entry to services (see [table 2](#)). These services typically included specialized early intervention programs,^{39,50} hospital admissions,^{14,43} and other unspecialized treatments in the broader community.³²

Quality Appraisal

[Table 1](#) includes a summary of quality scores for included studies. Item five from the original measure was excluded as there were no subgroup analyses in the included studies. Item nine was also excluded as we did not conduct a survey study and hence, low response rates were not applicable. An overall score was given for each study, with a potential maximum score of 7. Approximately 10 disagreements were identified and were all resolved through discussion. Quality scores ranged between 0^{12,52} and 6,^{21,39} and the average score was 3.68. Most studies included representative samples with large sample sizes

and provided sufficient information about the sample and study setting. About half of the studies recruited participants from both inpatient and community services and collected data consistently across researchers. Only a few studies (11 studies) used standardized measurement tools or existing definitions for assessing violence. No studies reported all relevant statistics (n , %, CI).

Meta-analysis of Rates of Violence According to Severity

Any Violence A meta-analysis of 17 studies^{11,12,14,21,27,28,30,32,39,43,47,48,50,51,54} including 4269 participants, found a pooled prevalence of 13.4% (95% CI [9.0%–19.5%]) for any violence, regardless of timepoint (ie, before presentation, at first presentation or after presentation to services). This value included less serious,^{14,21,39,49,55} serious,^{11,12,14,21,22,25–27,30,32,39,48,50,51} and severe^{25,43,50,51} violence. The prevalence of any violence ranged between 3.8%⁵⁰ and 43.6%.⁴⁷ The between-study heterogeneity was very high ($I^2 = 95.3\%$, 95% CI [93.7%–96.5%]; $Q = 340.4$, $df = 16$, $P < .0001$). The exclusion of outliers led to lower between-study heterogeneity ($I^2 = 84.8\%$ vs 95.3%) however, outliers were not removed as the between-study heterogeneity remained high ($I^2 > 75$), and the removal of outliers led to a large reduction in sample size (from 17 to 11 studies). [Supplementary figure 1](#) displays a forest plot of included studies and relevant statistics.

Less Serious Violence Four studies^{21,25,32,49} reported the prevalence of less serious violence. The pooled proportion was 16.3% (95% CI [9.1%–27.4%]) amongst 1230 participants (see [Supplementary figure 2](#)), and the prevalence ranged between 11.5%²⁵ and 26.4%.²¹ Between-study heterogeneity was very high ($I^2 = 90.9\%$, 95% CI [79.7%–95.9%]; $Q = 33.3$, $df = 3$, $P = .0001$). No outliers were identified.

Serious Violence The pooled prevalence of serious violence, regardless of time period was 9.7% (95% CI [5.4%–17.0%]; see [Supplementary figure 3](#)). This value was pooled from seven studies,^{21,25,30,32,36,39,49,55} which included a total of 2208 participants. The prevalence of serious violence ranged between 2.6%²⁵ and 19.6%.⁴⁹ Between-study heterogeneity was very high ($I^2 = 91.6\%$, 95% CI [85.3%–95.2%]; $Q = 88.3$, $df = 6$, $P < .0001$). No outliers were identified.

Severe Violence Two studies^{26,53} reported rates of severe violence. The pooled proportion was 2.2% (95% CI [0.0%–61.7%]) based on 414 participants (see [Supplementary figure 4](#)), and ranged between 0.0%²⁶ and 2.7%.⁵³ There was no between-study heterogeneity ($I^2 = 0.0\%$) or outliers.

Meta-analysis of Rates of Any Violence According to Timing of Violence

Before Presentation to Services The pooled proportion of any violence before entry to services was 11.6% (95% CI [6.8%–18.9%]; see [Supplementary figure 5](#)). This figure was pooled from 11 studies,^{11,12,21,22,26–28,32,39,50,54} which included a total of 3415 participants. The prevalence ranged between 3.8%⁵⁰ and 38.2%.²¹ Between-study heterogeneity was very high ($I^2 = 96.5\%$, 95% CI [95.1%–97.5%]; $Q = 284.3$, $df = 10$, $P < .0001$). Although the removal of outliers led to a small reduction in between-study heterogeneity ($I^2 = 83.6\%$ vs 96.5%), the heterogeneity remained very high ($I^2 > 75$), and the removal led to a reduction in sample size (from 11 to 9 studies). Hence, outliers were not removed.

At First Presentation to Services A meta-analysis of five studies^{22,25,30,47,52} with 955 participants revealed a pooled proportion of 20.8% (95% CI [9.8%–38.7%]; see [Supplementary figure 6](#)) for any violence at first presentation to services. The prevalence ranged between 8.3%⁵² and 43.6%.⁴⁷ Between-study heterogeneity was very high ($I^2 = 88.8\%$, 95% CI [76.6%–94.7%]; $Q = 35.8$, $df = 4$, $P < .0001$). No outliers were identified.

Following Treatment Initiation Five studies^{14,32,39,43,50} reported rates of violence following entry to services, amongst a total of 1525 participants. The pooled proportion of any violence following treatment initiation (ie, since first entry to services) was 13.3% (95% CI [7.3%–23.0%]) and the prevalence ranged between 7.3%¹⁴ and 23.4%.³² (see [Supplementary figure 7](#)). The between-study heterogeneity was very high ($I^2 = 91.3\%$, 95% CI [82.6%–95.6%]; $Q = 45.9$, $df = 4$, $P < .0001$). No outliers were found.

Comparison of Pooled Proportions Across Timepoints The pooled proportion was highest at first presentation to services (20.8%) compared to other timepoints (before presentation, after presentation to services) and there was a decrease in the pooled proportion of violence following entry to services (20.8% vs 13.3%). Subgroup analyses revealed statistically significant differences in pooled proportions across timepoints (before presentation, at presentation, after treatment initiation; 17 studies, $Q = 7.0$, $df = 2$, $P = .03$). Additional subgroup analyses revealed significantly lower rates of any violence after first presentation (ie, following treatment) compared to rates before service contact (12 studies, $Q = 0.6$, $df = 1$, $P = .45$; risk ratio = 1.01, standard error = 0.03) and at initial contact with services (7 studies, $Q = 7.0$, $df = 6$, $P < .0001$; risk ratio = 1.61, standard error = 0.06). There were no significant differences in rates of any violence before versus at first presentation to services (15 studies, $Q = 2.7$, $df = 1$, $P = .10$). According to meta-regression analyses, later publication year (ie, more recent

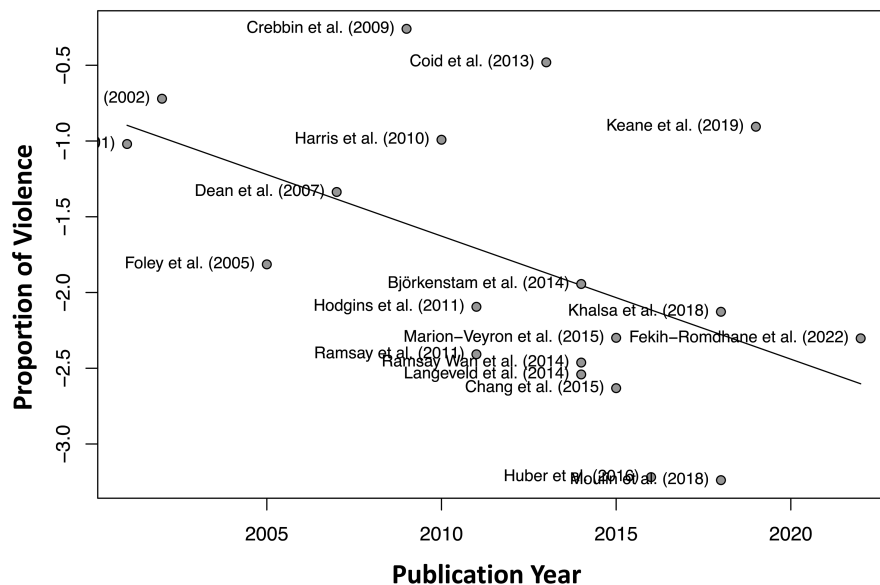


Fig. 2. Meta-regression results comparing publication year and proportion of violence.

publication year) was significantly associated with lower rates of violence (19 studies, $\beta = -.08$, 95% CI = $[-0.15, -0.02]$, $P = .04$; see figure 2).

Frequency of Violent Episodes Only two studies^{26,32} included additional information about the frequency of violent behavior. One study³² reported six episodes of less serious and 14 incidents of serious violence amongst participants before presentation to services, and an additional 121 and 25 episodes of less serious and serious violence, respectively, after treatment initiation. In another study,²⁶ 25 people engaged in one to three episodes of violent episodes, five people had 4–10 incidents, and only one person had over 10 episodes of violence prior to first presentation to services.

Discussion

This study is the first comprehensive review conducted in the past 10 years to specifically examine violence according to both severity (ie, less serious, serious, severe) and the time point at which violence was committed (ie, before treatment, at first presentation to services, after treatment initiation), during FEP. This provided greater detail regarding the nature of the violence perpetrated and the potential impacts of treatment on reducing violence.

There are three main findings. First, the overall rate of any violence in people with FEP, regardless of time point (13.4%), was lower than those reported in older reviews^{1,10,17} (between 28%¹⁷ and 35.4%¹) however, similar to a more recent study,⁶⁰ which found reported a prevalence of 20.3%. Our findings also revealed lower rates of serious violence (9.7%) compared to previous findings,

which have reported pooled proportions between 13%¹⁷ and 16.6%.^{1,10} One explanation for this decline is the potential effects of SEI services, which have been more broadly implemented over the past 20 years.^{18,19} SEI programs differ from standard treatment practices by focusing on the early detection of people experiencing prodromal symptoms and preventing the onset of psychotic illness in these groups. These services aim to prevent the worsening of illness amongst those in the early stages of full-threshold psychotic disorder.^{55,61,62} SEIs also aim to treat known risk factors of violence, including substance misuse,^{1,10,17,25} positive symptoms (eg, delusions, hallucinations)^{14,17} and longer duration of untreated psychosis (DUP),^{1,7} which may subsequently lead to lower violence risk. However, this is speculative and further research is needed to clarify whether other factors may be influencing this trend. Additionally, whilst the rate of severe violence (2.2%) was higher than those reported in previous reviews (0.6%¹), this finding should be interpreted with caution given the small sample size of two studies. One possible explanation for this difference is that severe acts of violence may have not been included in earlier studies due to the severity of behavior (eg, incarcerated for violent crimes).

Second, the pooled proportion of violence was highest at first presentation to services (20.8%) and significantly lower post-contact with services (13.3%), with the risk of violence perpetration being almost two times lower following treatment initiation (ranged between 4 weeks⁴³ and 10 years¹⁴ following entry to services). This was consistent with previous reviews, which found significant reductions in rates of violence¹⁴ and homicide⁸ following treatment. In the current review, treatment typically involved community-based specialized early

intervention programs,^{39,50} hospital admissions,^{14,43,63} and other unspecialized treatments in the broader community.³² Further, given the rate of violence was highest at first presentation to services, our findings suggest that this period is associated with increased vulnerability for violence. It was not possible to identify the exact time point at which the risk of violence was highest, as most studies did not specify the time range at which violence was assessed at first presentation (eg, within the first week of presentation). While our findings are consistent with most previous reviews, one earlier study found that rates of serious aggression (ie, violence) was not significantly different pre- and post-contact with services.¹⁷ It is possible that differences in the defined time periods (ie, pre- and post-contact) may have contributed to this discrepancy. It is also likely that other treatment related factors such as involuntary treatment^{1,64} and non-adherence to psychological and pharmacological treatment,^{2,65,66} as well as clinical presentations such as comorbid substance use^{1,12,32,67,68} and longer DUP,^{7,36} may have contributed to the non-significant reduction in rates post treatment initiation.

Third, consistent with previous reports,^{2,3} we found notable inconsistencies in the definition, measurement, and classification of violence. Our results showed that across studies violence has been defined according to varying sources (eg, existing reviews, dictionaries, standardized assessment tools), whilst some studies appeared to have defined violence arbitrarily or failed to provide any definition. Violence has also been measured differently across studies (eg, patient interview, self-reports, police records), and classified inconsistently based on severity and timing of violence. Most studies used a combination of methods, which has been previously recommended,² as single measures are likely to cause selective and partial reporting of violence. Overall, the discrepancies in the definition, measurement and classification of violence make it difficult to compare rates across studies,² and are likely to contribute to the very high between-study heterogeneity that was observed in the current study. Other methodological factors such as differences in study design (eg, inpatient versus community samples) may also contribute to the disparity in results.³ This could be associated with variations in the threshold for inclusion/exclusion of participants (eg, only including those with specific diagnoses of mental illness), further contributing to the between-study heterogeneity. Moving forward, this field would benefit from using consistent methods to examine violence, as rates can vary depending on the measurement tool used. For instance, it has been reported that the use of structured, standardized assessment tools (eg, MOAS, PPHS) has led to increased reporting of aggression and violence compared to unstructured assessments (35% vs 26%), whilst the use of self-reports has led to the reporting

of higher rates of violence (34%) compared to case notes (31%) or criminal records (27%).¹⁷

Clinical Implications

The findings of this study suggest that the overall rate of violence appears to have declined in the last 20 years; however, it is important to consider potential factors that may be contributing to this decline, such as changes in how violence has been defined and measured over time. Furthermore, findings show that rates of violence amongst FEP populations are higher at first presentation to services until people are effectively treated.

The prevalence of any violence was higher at first presentation to services (20.8%), indicating that more timely intervention is needed prior to this period, particularly during the DUP stage or the ultra-high risk (UHR) stage, which is considered the putatively prodromal stage of psychosis.⁶⁹ This will be important for preventing poor clinical and functional outcomes, including future acts of violence.¹ Previous incarceration, including those related to violent behavior, can lead to treatment delay of up to 2 years,^{11,12} more severe positive symptoms (eg, delusions, hallucinations), poorer premorbid adjustment, and disruptions in the continuity of care and maintenance of existing social support networks.^{12,70} One way to enhance prevention is to address the barriers to early treatment, including the poor integration of mental health services and the criminal justice system. Families of people with psychosis often make several attempts to access services before finally receiving treatment,^{71,72} and many people rely on the criminal justice system as a provider of mental health services or the “last resort” (State of Victoria, 2021). By the time they access treatment, particularly if DUP is significantly lengthened, the risk of committing violence is likely to be higher,^{1,7,73} and opportunities to intervene early and prevent violence may be missed. It may also be important to involve other services such as police and drug and alcohol services, since previous offending³⁹ and substance use^{1,10,17,25} are associated with a greater risk of violence perpetration.

Although our findings showed a significant reduction in violence following treatment initiation, the prevalence remained high. One possible explanation is that existing interventions may not be suitable or effective in reducing violence in non-offender populations with psychotic disorders.^{71,74,75} Although interventions such as cognitive behavioral therapy (CBT) appear to be effective amongst offender populations, its effectiveness and appropriateness for clinical populations are unclear, as most interventions targeting violence and aggression are developed from offender populations.⁷⁴ Whilst this highlights the need for interventions that specifically target risk for violence in clinical populations,¹⁷ there is also a need for more holistic approaches to maximize recovery and prevent violence, such as a combination of individual and

group-level interventions,^{76,77} risk assessment and appropriate safety planning, in addition to pharmacological treatment (eg, antipsychotic medication).

Limitations and Future Directions

The current review has a few limitations. First, we did not examine predictors of violence as this was beyond the scope of the review. Second, we adopted a stricter approach to inclusion, particularly around FEP groups, which may have led to the exclusion of potentially relevant studies and thus, limit the generalizability of findings. Studies were excluded if they did not specify what diagnostic method was used to define FEP or early psychosis, or if well-validated tools were not used (eg, DSM, ICD). This was to ensure that studies were of high quality, and that diagnoses were made using standardized tools, particularly given diagnoses can be difficult to establish during early stages of illness. Third, we included studies even if they claimed to assess violence or used measures of aggression (eg, MOAS), but did not specify whether they included physical violence towards people *only*. Consequently, there is potential for the inclusion of irrelevant outcomes, such as rates of verbal aggression, or violence towards objects. However, the exclusion of these studies would have led to a significant reduction in sample size and the loss of important data related to violence towards others. Fourth, we did not conduct thorough analyses of heterogeneity, as this was outside the scope of the review. However, differences in methodological factors such as the definition, measurement and classification of violence, timing of violence, and sample characteristics (eg, inpatient versus community outpatient versus SEI services) are likely to contribute to the high heterogeneity. Future studies may consider using subgroup analyses based on study design to investigate reasons for the high between-study heterogeneity. However, this may be challenging due to the limited information around study methodology. Fifth, due to selecting articles that were only written in English, there is potential for language and publication bias, and the inability to examine cross-cultural differences in rates of violence. The exclusion of gray literature may also contribute to publication bias.

Although we used existing definitions from previous reviews¹ to allow for comparability, there was notable heterogeneity in the definition, measurement, and classification of violence across studies. Future studies are encouraged to use a combination of various data sources (eg, patient interviews, medical records, official police data, self-reports), standardized assessment tools (eg, MOAS, PPHS), and existing definitions of violence, in a standardized way. A universally accepted data collection protocol may be helpful for addressing these inconsistencies. It is also recommended that studies report specific rates for different severities of

violence, rather than only reporting the overall rate of any violence. This can provide richer data about the type of violent behavior committed by people with FEP.

Conclusion

Overall, the rate of violence during FEP appears to be lower in more recent years compared to those reported in previous reviews, although further research is needed to identify potential factors that may be contributing to this trend. Treatment appears to be effective for reducing violence however, rates remain high following service contact. Consequently, more targeted, early and accessible treatment is needed to prevent violence, and other negative outcomes such as longer DUP and worsening of clinical symptoms. A greater integration of mental health and criminal justice services could allow for the early identification of and better access to treatment in those at risk of perpetuating violence. Specialized and holistic interventions are also needed for clinical FEP populations with a history of violence to prevent future offending. Future studies are encouraged to use standardized measures to ensure consistent measurement of violence.

Supplementary Material

Supplementary material is available at <https://academic.oup.com/schizophreniabulletin/article/50/4/757/7615032>.

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Conflict of interest

All authors declare that they have no conflicts of interest.

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