

# Stalking behaviors and Personality Disorders: A systematic review

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## Abstract

**Background.** Stalking, only recently criminalized in some countries, involves persistent harassment with severe psychological effects. Research explores prevalence, typologies, personality profiles, gender differences and the need for prevention and treatment strategies.

**Methods.** A systematic search was conducted on Medline/Pubmed and Scopus in mixed clinical-forensic populations. The analysis included 2378 patients with stalking behavior, 14% of whom were female. Results: According to PRISMA (2021) guidelines, 12 papers were included in the systematic review from an initial sample of 200. A higher prevalence of PDs, particularly within Cluster B (i.e., antisocial, narcissistic, borderline; PD) was observed among stalkers. Moreover, PDs appear to be associated with recurrent stalking behavior, whereas findings remain inconsistent regarding their role in the development of violent behaviors.

**Conclusions.** PD diagnosis appears to be a risk factor associated with stalking behavior. A more precise research focus on the evaluation of the individual's psychological profile is warranted in order to prevent recidivism and plan tailored interventions. *Clin Ter 2026; 177 (5):1273-1280 doi: 10.7417/CT.2026.2129*

**Keywords:** Harassment; obsessional follower; gender-based violence; psychopathology; psychological traits; mental health.

## Introduction

The phenomenon of stalking is a long-standing behavior; however, it has only recently been criminalized, and solely in certain countries, even after its initial recognition as a criminal offense in the United States in 1990 (1). As reported in Meloy & Gothard's study (2), stalking is defined as the intentional, malicious, and repeated pursuit and harassment of another person, which threatens their safety.

The most frequent intrusive behaviors involve unwanted communications and contacts directed at the victim (e.g., messages, phone calls, approaches, and following), as well as threats and assaults on the victim, and the pursuit of people

close to them (3,4). Although most behaviors carried out in the context of stalking do not result in acts of physical violence, its impact on victims can be devastating, with high rates of psychological distress often resulting from long-term harassment (5-8). Occasionally, such episodes of violence can escalate over time, resulting in the perpetration of physical or sexual violence and occasionally in the killing of the victim (9). In support of this, several studies conducted in the US and the UK reveal that most murders or attempted murders of women were preceded by stalking behavior. These findings should raise concern about the prodromal role that persecutory acts may play in femicides (10-12). Reviewed studies have reported stalking prevalence rates between

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10.2% and 50%, with higher quality papers reporting a narrower range, from 13.9% and 14.3%. However, substantial variability in stalking definitions, methodological quality precluded precise prevalence estimation (13). An important contribution to the understanding of the phenomenon of stalking was provided by Mullen et al., who, in 1999 (14) identified five different types of stalkers, based on a sample of 145 stalkers from a forensic psychiatry center in Australia: the *rejected stalker*, characterized by feelings of rejection following the end of the relationship with the victim and a consequent desire for reconciliation or revenge; the *intimacy seeker*, who looks for a victim with whom to establish an intimate relationship due to a pervasive sense of loneliness; the *incompetent stalker*, who tries to establish intimate relationships but fails due to limited social and cognitive skills; the *resentful stalker*, identified as the subtype most prone to violence, who engages in such behaviors following real or perceived humiliations; finally, the *predatory stalker*, who follows the victim to gather information useful for carrying out a sexual assault (15). In the literature, research aimed at investigating possible associations between stalking behaviors and psychopathological traits appears dated and predominantly focused on Personality Disorders (PD), with particular attention to Cluster B. This interest is justified by multiple pieces of evidence that highlight how a substantial proportion of stalkers exhibit disturbed personality traits, especially pertaining to this Cluster (3, 4, 16, 17). Stalking is traditionally regarded as predominantly male-perpetrated, accounting for approximately 75–80% of offenders, with about 80% of victims being women, thereby framing it as a gender-based crime. However, a notable proportion of perpetrators are female, with prevalence estimates ranging from 7% to 33%, depending on the studies (18, 19). Despite this evidence, a significant gap remains in the literature. Many previous studies have focused exclusively on male offenders or have included mixed samples without systematically analyzing gender-specific patterns. This has hindered a more precise understanding of whether distinct personality profiles are associated with stalking across genders. In addition, the literature appears fragmented in terms of methodological approaches and often lacks a clear focus on clinically relevant outcomes such as recidivism and persistence of stalking behavior. This review distinguishes itself from prior literature by including a mixed-gender sample, enabling a comparative analysis of gender differences in the personality profiles of individuals who engage in stalking. In general, the availability of more up-to-date and robust information on the psychopathological profile of stalkers would allow the development of targeted preventive interventions and enhanced support for victims, as well as treatments for perpetrators. This is particularly relevant in light of current, discouraging data on recidivism rates, which approach or even exceed 50%, as well as the lack of effective therapeutic guidelines to mitigate it, as highlighted in a recent systematic review conducted by Travaini et al. (17, 20–23).

Considering these points, the aim of the present systematic review is to investigate the potential association between stalking behavior and PDs within mixed clinical-forensic samples, providing a contribution to the understanding of this phenomenon.

## Materials and methods

This systematic review was conducted in accordance with the Preferred Reporting Items for Systematic Review and Meta-Analyses (PRISMA) guidelines (24). A systematic literature search was undertaken to identify studies investigating the association between personality pathology and stalking behaviors. The search was performed across two major databases, Medline/PubMed and Scopus. The full search strategy is reported in detail in the dedicated subsection. Eligibility criteria were defined *a priori* and are outlined in the corresponding subsection, where both inclusion and exclusion criteria are specified. The study selection process was conducted in sequential stages. First, titles and abstracts retrieved from the database search were independently screened by two reviewers to evaluate their potential relevance. Subsequently, full-text articles were independently assessed against the predefined eligibility criteria. Any discrepancies between reviewers were resolved through discussion, with the involvement of a third reviewer when necessary. The study selection process is summarized in a PRISMA flow diagram. Disagreements were resolved by consensus or, when required, through consultation with a third reviewer. The application of the STROBE framework enabled a structured appraisal of reporting quality and supported the critical interpretation of the included studies. Given the heterogeneity of study designs, populations, and outcome measures, a quantitative synthesis (meta-analysis) was not appropriate. Therefore, findings were synthesized using a narrative approach, focusing on recurring patterns and clinically relevant associations across studies.

All methodological procedures described above are reported in greater detail in the corresponding subsections.

### Literature search

A systematic search strategy was employed to identify pertinent studies. The literature search was conducted on 2 October 2024. The Medline/PubMed and Scopus databases were searched by two investigators using the following keyword string applied to all fields (including titles, abstracts, keywords, and full text) to include the largest possible number of studies: “personality” AND (“disorder” OR “traits”) AND (“stalk\*” OR “harass\*” OR “obsess\* follow\*”).

### Inclusion and exclusion criteria

Each study included in this review assessed the relationship between PDs or dysfunctional personality traits and the phenomenon of stalking. To analyze comparable results, only studies conducted on perpetrators of stalking in clinical and/or forensic settings over the age of 18, of mixed gender, that investigated the presence of PDs were included. To focus the analysis on the research question, studies involving co-occurring diagnoses of major psychiatric disorders or cognitive delay or impairment were excluded. Only studies published in English or Italian were included; opinion papers, case reports, case series, reviews, meta-analysis and papers whose full text was unavailable even after contacting the corresponding author were excluded. Only studies including mixed-gender samples were considered to enhance

methodological consistency and comparability across findings. This criterion ensured a more representative overview of stalking offenders, in line with current international guidelines recommending the inclusion of both sexes to reduce selection bias and increase external validity (24, 25).

#### Data extraction

Titles and abstracts were screened by two reviewers independently, in duplicate, to determine whether retrieved studies met the above-outlined inclusion criteria. Full-text articles were obtained for studies apparently meeting inclusion criteria or where a decision could not be made from the title and/or abstract alone, for a detailed review against inclusion criteria. Full-texts articles were independently assessed for eligibility by two reviewers. Discrepancies were resolved by an initial discussion with a third reviewer, when required. A standardized form was used to extract data from the included studies to assist in evidence synthesis. Extracted information included: study setting, study design, participant characteristics, study methodology (e.g., screening tools), diagnosis frequency and authors' conclusions. Extraction was completed by two reviewers independently, in duplicate. A third reviewer was consulted when needed.

#### Quality evaluation

The assessment of studies' quality was conducted using the STROBE Statement Checklist (26). The STROBE Checklist contributes to improving the reporting quality

of reporting of observational studies by assessing 22 main items across the following sections: abstract, introduction, methods, results, and discussion. This scale provides a useful indication of the essential information needed to appraise the conduct of such studies (27). The STROBE Statement provides guidance to authors about how to improve the reporting of observational studies and facilitates critical appraisal and interpretation of studies by reviewers, journal editors, and readers (26).

#### Results

Out of a total of 464 records retrieved through database searches (PubMed = 100; Scopus = 364), 93 studies were identified as eligible for inclusion. After reviewing the full content of the papers, 81 were excluded for several reasons: 1 was not retrievable, 50 addressed a different research focus (i.e., other mental disorder than PD, victimization), 16 involved an inappropriate population, 8 had an inappropriate study design and 6 were written in other languages than English or Italian. The process of identifying eligible studies is outlined in Fig 1.

#### Studies, participants, and characteristics

The characteristics of the included studies are presented in Tables 1 and 2, which include key information for each selected study, such as the author, country of origin, data

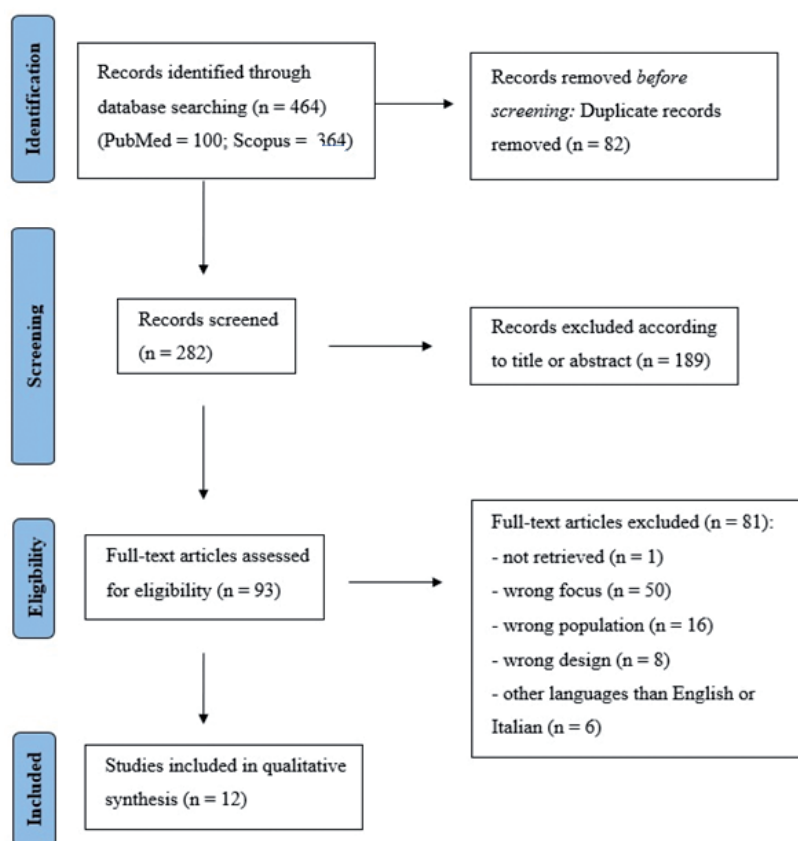


Fig. 1. PRISMA flow diagram

Table 1. Characteristics of the selected studies.

| Author (year)                     | Country                  | Data source                                                         | Sample                             | Design                             | Diagnostic criteria<br>Screening tools                                                                                        | Prevalence                                                               |
|-----------------------------------|--------------------------|---------------------------------------------------------------------|------------------------------------|------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|
| Catanesi et al. (2019)            | Italy                    | 28 Italian REMS - Residences for the Execution of Security Measures | N = 730 (89% male, 11% female)     | Cross-sectional study              | DSM-5                                                                                                                         | 32,3%                                                                    |
| James et Farnham (2003)           | United Kingdom           | North London Forensic Service                                       | N = 85 (85% male, 15% female)      | Cohort study                       | DSM-IV                                                                                                                        | 24%                                                                      |
| McEwan et Strand (2013)           | Australia                | Specialist community clinic in Melbourne                            | N = 211 (90% male, 10% female)     | Cohort study                       | DSM-IV-TR<br>MMPI-2<br>MCMI-III                                                                                               | 46,2%                                                                    |
| McEwan et al. (2016)              | Australia                | Stalking clinic in Melbourne                                        | N = 157 (91% male, 9% female)      | Cohort study                       | DSM-IV-TR<br>SCID-II<br>Item PD di HCR-20                                                                                     | 19,1%                                                                    |
| Meloy, Davis et Lovette (2001)    | United States of America | Forensic Evaluation Unit – Superior Court of San Diego County       | N = 59 (88,1% male, 11,9% female)  | Cohort study                       | No structured Diagnostic interview. All subjects were diagnosed using DSM-IV criteria                                         | 61%                                                                      |
| Meloy et al. (2000)               | United States of America | Forensic Evaluation Unit – Superior Court of San Diego County       | N = 65 (83% male, 17% female)      | Comparative non-experimental study | No structured diagnostic interview; Assessments by psychiatrists or psychologists                                             | 61,5%                                                                    |
| Mullen et al. (1999)              | Australia                | Psychiatric-forensic treatment centre in Melbourne                  | N = 145 (79% male, 21% female)     | Retrospective observational study  | DSM-IV                                                                                                                        | 51%                                                                      |
| Nijdam-Jones et al. (2018)        | United States of America | Community-based treatment program in New York City                  | N = 137 (94.2% male, 5.8% female)  | Cross-sectional study              | SCID-II<br>DSM-IV                                                                                                             | 49.6%                                                                    |
| Rosenfeld (2003)                  | United States of America | New York City Forensic Psychiatry Clinic                            | N = 189 (77% male, 23% female)     | Cohort study                       | DSM-IV-TR<br>Clinical-forensic evaluations                                                                                    | 36,5%                                                                    |
| Sandberg, McNiel et Binder (1998) | United States of America | UCSF Langley Porter Psychiatric Institute in San Francisco          | N = 17 (82% male, 18% female)      | Case-control study                 | Review of patients' medical records                                                                                           | 47%                                                                      |
| Strand et McEwan (2012)           | Sweden, Australia        | Swedish police and a stalking clinic in Melbourne                   | N = 550 (87,1% male, 12,9% female) | Cross-sectional study              | Assessment by a psychiatrist/psychologist in Australia. Assessment by police officers through structured guidelines in Sweden | 22,2%**<br>(**Axis II diagnoses were only made in the Australian sample) |
| Whyte et al. (2008)               | United Kingdom           | High-security Broad-moor Hospital                                   | N = 33 (84,8% male, 15,2% female)  | Cohort study                       | Review of patients' medical records                                                                                           | 60,6%                                                                    |

source, sample characteristics, study design, diagnostic criteria used, PDs' prevalence rates (Tab. 1), and main findings (Tab. 2).

#### *PD and risk of stalking*

Two studies evaluated the characteristics of a sample of stalkers by focusing primarily on psychopathological variables. In the study coordinated by Sandberg (28), the authors analyzed a sample of patients who stalked, threatened, or harassed medical staff after being discharged from the hospital. This sample was significantly more likely to have a diagnosis of PD or paranoid disorder (47%) compared to other types of psychiatric patients admitted to the same hospital ( $\chi^2 = 16.27$ ,  $p < .001$ ). Similarly, in the study conducted by Catanesi (29), the most common psychiatric diagnosis among those convicted of stalking was PD (36.2%).

#### *PD and stalking recidivism*

The works of McEwan et al. (21), McEwan and Strand (3), and Rosenfeld (23) provide data on the risk of stalking recidivism in association with a PD diagnosis. In the first two studies, PDs were found to be significantly correlated with recurrent stalking (57%,  $\chi^2 = 10.34$ ,  $p = .05$ ; 31%,  $\chi^2 = 5.56$ ,  $p = 0.02$ , respectively). In the third study, it emerged that perpetrators of stalking with a Cluster B PD (17.6%) (i.e., antisocial, borderline, and narcissistic personality disorders) had a significantly higher likelihood of recidivism compared to the rest of the sample, including those with Cluster A and Cluster C PD diagnoses ( $\chi^2 = 13.03$ ,  $p = .0003$ ).

#### *PD and stalking typology*

Five studies examined the characteristics of stalking behavior and their perpetrators. In the study conducted by

Table 2. Main results of the selected studies.

| Author (year)                     | Results                                                                                                                                                                                                                                                                                                                                        |
|-----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Catanesi et al. (2019)            | The most common diagnosis among those convicted of stalking is PD (36.2%). It is also the most common diagnosis in crimes against property (25.6%).                                                                                                                                                                                            |
| James et Farnham (2003)           | No association was found between serious violence (serious assault or murder) and the presence of a PD ( $\chi^2 = 1.51$ , $p = .219$ ).                                                                                                                                                                                                       |
| McEwan et Strand (2013)           | Serial stalkers are more likely to be diagnosed with a PD or present a highly problematic personality trait (57% vs. 36%, $\chi^2 = 5.56$ , $p = 0.02$ , OR = 2.4, 95% CI = 1.2 to 5.0).                                                                                                                                                       |
| McEwan et al. (2016)              | Personality disorders are significantly correlated with recurrent stalking, with a moderate effect-size ( $\chi^2 = 10.34$ , $p = .05$ ).                                                                                                                                                                                                      |
| Meloy, Davis et Lovette (2001)    | No statistically significant differences were found between violent and non-violent subjects regarding the presence of a PD ( $\chi^2 = 1.04$ , $p > .05$ ).                                                                                                                                                                                   |
| Meloy et al. (2000)               | Most "obsessional followers" have a diagnosable PD, typically belonging to Cluster B.                                                                                                                                                                                                                                                          |
| Mullen et al. (1999)              | Psychiatric diagnosis is associated with the number of harassing behaviours: in particular, individuals with PD engaged in a greater variety of stalking behaviours ( $F = 3.04$ , $p < .02$ ). Individuals with PD were approximately twice as likely to follow their victims compared with other stalker groups ( $z = 3.30$ , $p < .001$ ). |
| Nijdam-Jones et al. (2018)        | No significant differences were reported between stalkers with and without a Cluster B PD with regard to stalking characteristics involving former intimate partners. Similarly, no significant differences emerged between offenders with and without paranoid PD in relation to the nature of their relationship with the victim.            |
| Rosenfeld (2003)                  | Offenders with a Cluster B PD (i.e., antisocial, borderline, narcissistic) had a significantly higher probability of reoffending than other offenders, including those with other PD diagnoses ( $\chi^2 = 13.03$ , $p = .0003$ ).                                                                                                             |
| Sandberg, McNeil et Binder (1998) | Patients who stalked, threatened, or harassed medical staff after discharge from hospital were significantly more likely to have a diagnosis of PD and/or paranoid disorder, erotomanic subtype, compared with other psychiatric inpatients admitted to the same hospital ( $\chi^2 = 16.27$ , $p < .001$ ).                                   |
| Strand et McEwan (2012)           | Women are more significantly likely to be diagnosed with a PD than men (OR 3.2, 95% CI 1.2-8.8).                                                                                                                                                                                                                                               |
| Whyte et al. (2008)               | No significant differences were observed between stalkers and non-stalkers in terms of psychiatric diagnoses.                                                                                                                                                                                                                                  |

Meloy et al. most of the obsessional followers, primarily motivated by anger, both threatened and engaged in violence toward persons or property (16). Most obsessive stalkers were diagnosed with a PD (61, 5%), typically from Cluster B (9,2% ASPD). In the work of Mullen and colleagues (14), psychiatric diagnosis was associated with the number of harassing behaviors, and individuals with PDs engaged in a broader range of stalking behaviours ( $F = 3.04$ ,  $p < .02$ ). Contrasting findings emerged from the study by Meloy and colleagues (30), which did not find significant differences between violent ( $N=34$ ) and non-violent ( $N=21$ ) stalker groups in the presence of a PD ( $\chi^2 = 1.04$ ,  $p > .05$ ). Similarly, in the study by James and Farnham (31), it was not possible to demonstrate any association between PD diagnosis (24%) and severe violence in stalking behaviors ( $\chi^2 = 1.51$ ,  $p < .219$ ). Finally, in the study by Nijdam-Jones et al. (32), no significant differences were found between stalkers with Cluster B PD ( $N=54$ ) and those without ( $N=91$ ), with regard to stalking behaviors directed at former intimate partners.

#### PD and sex differences

Strand & McEwan (33) compared male and female stalkers ( $N = 550$ ; 87,1% male, 12,9% female), highlighting that female stalkers (71%) are more likely to receive a PD diagnosis than male stalkers (57%) (OR 3.2, 95% CI 1.2-8.8), specifically borderline, narcissistic, and dependent PD. Lastly, in contrast to the findings so far, in the study by Whyte et al. (34) conducted in a high-security psychiatric hospital, no statistically significant differences were

observed between stalker patients (9,1%) and non-stalker patients in terms of PD diagnoses.

#### Quality evaluation

Each article was assessed using the STROBE scale to evaluate its quality, as shown in Appendix A. While there is no specific threshold for item fulfilment that guarantees a high-quality article, a higher percentage generally indicates better reporting quality. The most comprehensive articles, in terms of completed items, were three (23, 31, 32); in these articles, only 3 items did not fully meet the STROBE standards. Most of the articles had between 4 and 6 incomplete items. Finally, only one had as many as 7 incomplete items (14). Overall, all the included studies can nevertheless be considered to be of high quality, as in most cases the criteria required by the studies under review were not applicable. Therefore, the overall quality of the present review can be regarded as moderate; however, this assessment should be interpreted with caution due to the limited generalizability of the STROBE tool.

#### Discussion

The findings of this review provide new insights into the role of PD in stalking, emphasizing the heterogeneity of patterns observed within this population. This review represents a significant update of the literature on the relationship between stalking and PDs. The adoption of strict

inclusion criteria, focusing on clinical-forensic samples, adult participants of both genders, and excluding major psychiatric comorbidities, allowed the contribution of PDs to be isolated. This work seeks to address the scarcity of systematic analyses on gender differences in the personality profiles of stalkers, offering a more nuanced and comparative perspective, and also addresses the limited focus on stalking persistence and recidivism, examined here in relation to Cluster B PDs.

All studies report similar demographic characteristics for the samples examined. The findings indicate a prevalence of male offenders, an age range corresponding to the third to fourth decade of life, a high level of education, a higher IQ level compared to the average found in perpetrators of other crimes, and employment (16). Only one study found that the category of stalkers was economically disadvantaged (34). These findings suggest that stalking is not necessarily associated with socio-economic disadvantage, but may instead be a product of specific personality traits and coping mechanisms. This pattern is not observed among other violent offenders (17, 35).

Clinical evaluations were conducted almost entirely using the diagnostic criteria of the Diagnostic and Statistical Manual of Mental Disorders (DSM), particularly the DSM-IV (36) and DSM-IV-TR (37) versions. A primary finding is the significant presence of PDs in stalkers. In research that differentiates between personality clusters, borderline, narcissistic, and antisocial PDs are the most commonly diagnosed. This would suggest that stalking behavior is closely related to the dysfunctional core features of these disorders: immaturity, emotional dysregulation, and interpersonal difficulties. The findings are in line with Mullen's description and classification of stalkers (14): those with borderline characteristics would stalk to seek intimacy, while those with narcissistic characteristics would be more prone to stalk in response to rejection, perceived as a profound devaluation of the self, capable of threatening their sense of identity. The results indicate that antisocial PD is less common among stalkers than among more physically violent offenders, whereas psychopathy appears more likely to prevail in predatory types of stalking (38). A possible explanation is that both antisocial and psychopathic individuals experience relationships with others in a utilitarian way, showing difficulties in creating interpersonal affective connections. Furthermore, stalking behaviors could be aimed at the subjection and exploitation of the victim. A mention should be given to dependent PD, more commonly reported among females, which shares with borderline disorder a marked fear of abandonment and difficulties in maintaining a sense of self-worth without external validation. Such dysfunctional traits may constitute the underlying basis of stalking behaviors exhibited by women, thereby contributing to the comparatively higher prevalence of PD observed among women who engage in this form of criminal conduct. Histrionic PD does not figure prominently, which may suggest that attention-seeking is not a primary driver of stalking behavior. In conclusion, it is evident that various underlying factors may contribute to the same deviant behavior.

Between 30% and 60% of stalking victims experience threats, and between 25% and 50% are physically assaulted (14). However, in most cases, these violent acts are non-fatal

and aimed solely at intimidation. A study conducted by Mullen in 1999 showed that the most severe and violent stalking behaviors were perpetrated by individuals with diagnoses of PDs (14). Our findings present conflicting perspectives on whether dysfunctional personality traits increase the risk of stalking behaviors, particularly those involving violent conduct. This suggests that other contributing factors, such as substance abuse, may also play a role (28). As previously discussed, individuals with antisocial or psychopathic traits are more likely to engage in sexual or physical violence associated with stalking behaviors.

If research on risk factors for violence associated with stalking is relatively robust, the literature lacks data on risk factors associated with persistence (i.e., increased duration) and recurrence (i.e., repetition of episodes) of stalking. Nevertheless, psychopathological factors can help characterize behavior in this context as well. Based on the studies included in this review, PDs appear to be significantly associated with recurrent stalking (3, 21). Moreover, stalkers with a Cluster B PD (i.e., antisocial, borderline, narcissistic) seem to have a significantly higher likelihood of recurrence compared to other offenders, including those with different PD diagnoses (23). The underlying reasons may vary depending on individual personality characteristics: for those with borderline traits, persistent difficulties in managing intense emotions such as anger may be predominant, while narcissistic and antisocial traits can lead to a lack of empathy for the victim. Additionally, individuals with antisocial or psychopathic traits may exhibit a lack of guilt and remorse, as well as an inability to learn from experience or punishment, which can contribute to the repetition of deviant behaviors. The decision to include only studies with mixed-gender samples was made to ensure greater methodological consistency and comparability across findings. This approach allowed for the examination of the relationship between personality disorders and stalking behaviors within homogeneous clinical-forensic contexts, minimizing variability that might otherwise arise from gender-specific diagnostic practices or sampling procedures. As the main objective of this review was not to examine gender differences per se but to explore the psychopathological correlates of stalking behaviors, focusing on mixed-gender samples allowed for a clearer assessment of the primary variable of interest, PD, without confounding effects related to gender distribution.

### Limitations and future directions

Unlike previous reviews that were limited to male samples (38), this study focused on mixed-gender samples without co-occurring major psychiatric disorders. This inclusion criterion reduced the number of eligible studies and clearly limits the generalizability of the findings to individuals without such comorbidities, but it allowed for a more controlled assessment of the personality disorder per se, minimizing the influence of additional potentially confounding variables. Regarding the limitations of the selected studies, it is important to note the heterogeneity in diagnostic assessments and their varying quality. Some studies had small sample sizes, and reliance on categorical diagnoses may oversimplify the identification of risk factors. The find-

ings can be interpreted within a dimensional framework such as the Hierarchical Taxonomy of Psychopathology (HiTOP) (39), which conceptualizes psychopathology as continuous spectra rather than discrete categories, in contrast to the Diagnostic and Statistical Manual of Mental Disorders (DSM-5). Adopting a dimensional approach, would allow for a more precise identification of transdiagnostic maladaptive personality traits, offering a more nuanced understanding of the phenomenon and enabling the development of targeted interventions. From this perspective, stalking behaviours may reflect transdiagnostic vulnerabilities—particularly antagonism, disinhibition, and negative affectivity—helping to explain the heterogeneity and comorbidity observed in these populations. However, this interpretation remains cautious, as most studies rely on categorical diagnoses and heterogeneous methods. Therefore, HiTOP is used here primarily as a conceptual lens rather than an empirically tested framework, highlighting the need for future research based on explicitly dimensional assessments to better clarify associations with persistence, recidivism, and violence. Gilbert and Daffern (40) provided an illustrative example of this approach. This method could also be beneficial in cases of stalkers without mental illness or with subclinical diagnoses. In this context, the study by Gamache et al. (41) demonstrates how this framework can provide a valid basis for studying stalking and represents an initial step toward identifying personality-based risk factors. Additionally, it is important to note that all the selected articles were observational studies, which may limit the strength of the evidence and the overall quality of the review.

## Conclusions

The study aimed to determine whether psychopathological profiles, particularly PDs, could be considered risk factors for stalking, thereby informing prevention and intervention strategies. In response to the research question, the collective results of the studies included in this review suggest an association between stalking behaviors and PDs or dysfunctional personality traits, especially considering Cluster B PDs. In terms of gender differences, the prevalence of PDs is even higher in the female sample of stalkers, attributable both to the increased frequency of diagnoses of certain disorders among female perpetrators (e.g., borderline PD) and to differing underlying motivations for stalking behavior that are influenced by the individual's gender.

Future research should aim for methodologically robust designs, such as longitudinal or quasi-experimental studies, while also addressing cyber-stalking and other manifestations of the phenomenon. Adopting a dimensional approach and further clarifying newly identified constructs will be essential to broaden the current literature, which remains limited to the significance of stalking.

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## Appendix A: STROBE Statement

Checklist of each article analysed.

Catanesi et al. (2019)

| Item No              |   | Recommendation                                                                                                                           |     |
|----------------------|---|------------------------------------------------------------------------------------------------------------------------------------------|-----|
| Title and abstract   | 1 | (a) Indicate the study’s design with a commonly used term in the title or the abstract                                                   | YES |
|                      |   | (b) Provide in the abstract an informative and balanced summary of what was done and what was found                                      | YES |
| Introduction         |   |                                                                                                                                          |     |
| Background/rationale | 2 | Explain the scientific background and rationale for the investigation being reported                                                     | YES |
| Objectives           | 3 | State specific objectives, including any prespecified hypotheses                                                                         | YES |
| Methods              |   |                                                                                                                                          |     |
| Study design         | 4 | Present key elements of study design early in the paper                                                                                  | YES |
| Setting              | 5 | Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection          | YES |
| Participants         | 6 | (a) Give the eligibility criteria, and the sources and methods of selection of participants                                              | YES |
| Variables            | 7 | Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable | YES |

|                              |     |                                                                                                                                                                                                   |     |
|------------------------------|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| Data sources/<br>measurement | 8*  | For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group              | YES |
| Bias                         | 9   | Describe any efforts to address potential sources of bias                                                                                                                                         | NO  |
| Study size                   | 10  | Explain how the study size was arrived at                                                                                                                                                         | YES |
| Quantitative<br>variables    | 11  | Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why                                                                      | YES |
| Statistical methods          | 12  | (a) Describe all statistical methods, including those used to control for confounding                                                                                                             | YES |
|                              |     | (b) Describe any methods used to examine subgroups and interactions                                                                                                                               | NO  |
|                              |     | (c) Explain how missing data were addressed<br>Missing data for some variables (age, duration of illness) were reported.                                                                          | YES |
|                              |     | (d) If applicable, describe analytical methods taking account of sampling strategy                                                                                                                | NO  |
|                              |     | (e) Describe any sensitivity analyses                                                                                                                                                             | YES |
| Results                      |     |                                                                                                                                                                                                   |     |
| Participants                 | 13* | (a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed | YES |
|                              |     | (b) Give reasons for non-participation at each stage                                                                                                                                              | NO  |
|                              |     | (c) Consider use of a flow diagram                                                                                                                                                                | NO  |

|                   |     |                                                                                                                                                                                                              |     |
|-------------------|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| Descriptive data  | 14* | (a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders                                                                     | YES |
|                   |     | (b) Indicate number of participants with missing data for each variable of interest                                                                                                                          | YES |
| Outcome data      | 15* | Report numbers of outcome events or summary measures                                                                                                                                                         | YES |
| Main results      | 16  | (a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included | YES |
|                   |     | (b) Report category boundaries when continuous variables were categorized                                                                                                                                    | NO  |
|                   |     | (c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period                                                                                             | NO  |
| Other analyses    | 17  | Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses                                                                                                               |     |
| <b>Discussion</b> |     |                                                                                                                                                                                                              |     |
| Key results       | 18  | Summarise key results with reference to study objectives                                                                                                                                                     | YES |
| Limitations       | 19  | Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias                                                   | YES |
| Interpretation    | 20  | Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence                                   | YES |
| Generalisability  | 21  | Discuss the generalisability (external validity) of the study results                                                                                                                                        | YES |

| Other information |    |                                                                                                                                                               |    |
|-------------------|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| Funding           | 22 | Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based | NO |

*James & Farnham (2003)*

| Item No              |   | Recommendation                                                                                                                               |
|----------------------|---|----------------------------------------------------------------------------------------------------------------------------------------------|
| Title and abstract   | 1 | (a) Indicate the study’s design with a commonly used term in the title or the abstract. YES                                                  |
|                      |   | (b) Provide in the abstract an informative and balanced summary of what was done and what was found YES                                      |
| Introduction         |   |                                                                                                                                              |
| Background/rationale | 2 | Explain the scientific background and rationale for the investigation being reported. YES                                                    |
| Objectives           | 3 | State specific objectives, including any prespecified hypotheses. YES                                                                        |
| Methods              |   |                                                                                                                                              |
| Study design         | 4 | Present key elements of study design early in the paper. YES                                                                                 |
| Setting              | 5 | Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection. YES         |
| Participants         | 6 | (a) Cohort study—Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up. YES |

|                              |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|------------------------------|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                              |    | <p><i>Case-control study</i>—Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls</p> <p><i>Cross-sectional study</i>—Give the eligibility criteria, and the sources and methods of selection of participants</p> <hr/> <p><i>(b) Cohort study</i>—For matched studies, give matching criteria and number of exposed and unexposed YES</p> <p><i>Case-control study</i>—For matched studies, give matching criteria and the number of controls per case</p> |
| Variables                    | 7  | Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable. YES                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Data sources/<br>measurement | 8* | For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group. YES                                                                                                                                                                                                                                                                                                                                                                              |
| Bias                         | 9  | Describe any efforts to address potential sources of bias YES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Study size                   | 10 | Explain how the study size was arrived at. YES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Quantitative<br>variables    | 11 | Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why. YES                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Statistical methods          | 12 | <i>(a)</i> Describe all statistical methods, including those used to control for confounding. YES                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                              |    | <i>(b)</i> Describe any methods used to examine subgroups and interactions YES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                              |    | <i>(c)</i> Explain how missing data were addressed NO                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                              |    | <p><i>(d) Cohort study</i>—If applicable, explain how loss to follow-up was addressed NO</p> <p><i>Case-control study</i>—If applicable, explain how matching of cases and controls was addressed</p>                                                                                                                                                                                                                                                                                                                                                                  |

|                                                                                                              |                                                                                                                                                                                                                      |
|--------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Cross-sectional study</i> —If applicable, describe analytical methods taking account of sampling strategy |                                                                                                                                                                                                                      |
| (e) Describe any sensitivity analyses. NO                                                                    |                                                                                                                                                                                                                      |
| <b>Results</b>                                                                                               |                                                                                                                                                                                                                      |
| Participants                                                                                                 | 13* (a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed. NO            |
|                                                                                                              | (b) Give reasons for non-participation at each stage NO                                                                                                                                                              |
|                                                                                                              | (c) Consider use of a flow diagram. NO                                                                                                                                                                               |
| Descriptive data                                                                                             | 14* (a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders. YES                                                                    |
|                                                                                                              | (b) Indicate number of participants with missing data for each variable of interest NO                                                                                                                               |
|                                                                                                              | (c) <i>Cohort study</i> —Summarise follow-up time (eg, average and total amount) NO                                                                                                                                  |
| Outcome data                                                                                                 | 15* <i>Cohort study</i> —Report numbers of outcome events or summary measures over time. YES                                                                                                                         |
|                                                                                                              | <i>Case-control study</i> —Report numbers in each exposure category, or summary measures of exposure                                                                                                                 |
|                                                                                                              | <i>Cross-sectional study</i> —Report numbers of outcome events or summary measures                                                                                                                                   |
| Main results                                                                                                 | 16 (a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included. YES |
|                                                                                                              | (b) Report category boundaries when continuous variables were categorized YES                                                                                                                                        |

|                          |    |                                                                                                                                                                                 |
|--------------------------|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                          |    | (c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period                                                                |
| Other analyses           | 17 | Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses. YES                                                                             |
| <b>Discussion</b>        |    |                                                                                                                                                                                 |
| Key results              | 18 | Summarise key results with reference to study objectives. YES                                                                                                                   |
| Limitations              | 19 | Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias. YES                 |
| Interpretation           | 20 | Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence. YES |
| Generalisability         | 21 | Discuss the generalisability (external validity) of the study results. YES                                                                                                      |
| <b>Other information</b> |    |                                                                                                                                                                                 |
| Funding                  | 22 | Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based YES               |

*McEwan Strand (2013)*

|                           | <b>Item No</b> | <b>Recommendation</b>                                                                      |
|---------------------------|----------------|--------------------------------------------------------------------------------------------|
| <b>Title and abstract</b> | 1              | (a) Indicate the study's design with a commonly used term in the title or the abstract YES |

|                          |    |                                                                                                                                                                                      |     |
|--------------------------|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
|                          |    | (b) Provide in the abstract an informative and balanced summary of what was done and what was found                                                                                  | YES |
| <b>Introduction</b>      |    |                                                                                                                                                                                      |     |
| Background/rationale     | 2  | Explain the scientific background and rationale for the investigation being reported                                                                                                 | YES |
| Objectives               | 3  | State specific objectives, including any prespecified hypotheses                                                                                                                     | YES |
| <b>Methods</b>           |    |                                                                                                                                                                                      |     |
| Study design             | 4  | Present key elements of study design early in the paper                                                                                                                              | YES |
| Setting                  | 5  | Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection                                                      | YES |
| Participants             | 6  | (a) Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up                                                           | YES |
|                          |    | (b) For matched studies, give matching criteria and number of exposed and unexposed                                                                                                  | NO  |
| Variables                | 7  | Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable                                             | YES |
| Data sources/measurement | 8* | For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group | YES |
| Bias                     | 9  | Describe any efforts to address potential sources of bias                                                                                                                            | YES |
| Study size               | 10 | Explain how the study size was arrived at                                                                                                                                            | YES |
| Quantitative variables   | 11 | Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why                                                         | YES |
| Statistical methods      | 12 | (a) Describe all statistical methods, including those used to control for confounding                                                                                                | YES |
|                          |    | (b) Describe any methods used to examine subgroups and interactions                                                                                                                  | YES |

|                   |     |                                                                                                                                                                                                              |     |
|-------------------|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
|                   |     | (c) Explain how missing data were addressed                                                                                                                                                                  | NO  |
|                   |     | (d) If applicable, explain how loss to follow-up was addressed                                                                                                                                               | NO  |
|                   |     | (e) Describe any sensitivity analyses                                                                                                                                                                        | NO  |
| <b>Results</b>    |     |                                                                                                                                                                                                              |     |
| Participants      | 13* | (a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed            | YES |
|                   |     | (b) Give reasons for non-participation at each stage                                                                                                                                                         | NO  |
|                   |     | (c) Consider use of a flow diagram                                                                                                                                                                           | NO  |
| Descriptive data  | 14* | (a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders                                                                     | YES |
|                   |     | (b) Indicate number of participants with missing data for each variable of interest                                                                                                                          | NO  |
|                   |     | (c) Summarise follow-up time (eg, average and total amount)                                                                                                                                                  | NO  |
| Outcome data      | 15* | Report numbers of outcome events or summary measures over time                                                                                                                                               | YES |
| Main results      | 16  | (a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included | YES |
|                   |     | (b) Report category boundaries when continuous variables were categorized                                                                                                                                    | YES |
|                   |     | (c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period                                                                                             | NO  |
| Other analyses    | 17  | Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses                                                                                                               | YES |
| <b>Discussion</b> |     |                                                                                                                                                                                                              |     |
| Key results       | 18  | Summarise key results with reference to study objectives                                                                                                                                                     | YES |

|                          |    |                                                                                                                                                                            |     |
|--------------------------|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| Limitations              | 19 | Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias                 | YES |
| Interpretation           | 20 | Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence | YES |
| Generalisability         | 21 | Discuss the generalisability (external validity) of the study results                                                                                                      | YES |
| <b>Other information</b> |    |                                                                                                                                                                            |     |
| Funding                  | 22 | Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based              | YES |

*McEwan (2016)*

| Item No            |   | Recommendation                                                                                           |
|--------------------|---|----------------------------------------------------------------------------------------------------------|
| Title and abstract | 1 | (a) Indicate the study’s design with a commonly used term in the title or the abstract YES               |
|                    |   | (b) Provide in the abstract an informative and balanced summary of what was done and what was found. YES |
| Introduction       |   |                                                                                                          |

|                          |    |                                                                                                                                                                                                                                                                                                                                                      |
|--------------------------|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Background/rationale     | 2  | Explain the scientific background and rationale for the investigation being reported. YES                                                                                                                                                                                                                                                            |
| Objectives               | 3  | State specific objectives, including any prespecified hypotheses YES                                                                                                                                                                                                                                                                                 |
| <b>Methods</b>           |    |                                                                                                                                                                                                                                                                                                                                                      |
| Study design             | 4  | Present key elements of study design early in the paper. YES                                                                                                                                                                                                                                                                                         |
| Setting                  | 5  | Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection. YES                                                                                                                                                                                                                 |
| Participants             | 6  | (a) <i>Cohort study</i> —Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up. YES<br><i>Case-control study</i> —Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls   |
|                          |    | <i>Cross-sectional study</i> —Give the eligibility criteria, and the sources and methods of selection of participants<br><br>(b) <i>Cohort study</i> —For matched studies, give matching criteria and number of exposed and unexposed.<br><i>Case-control study</i> —For matched studies, give matching criteria and the number of controls per case |
| Variables                | 7  | Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable. YES                                                                                                                                                                                                        |
| Data sources/measurement | 8* | For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group. YES                                                                                                                                                            |
| Bias                     | 9  | Describe any efforts to address potential sources of bias NO                                                                                                                                                                                                                                                                                         |
| Study size               | 10 | Explain how the study size was arrived at YES                                                                                                                                                                                                                                                                                                        |

|                        |     |                                                                                                                                                                                                                                                                                                           |
|------------------------|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Quantitative variables | 11  | Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why YES                                                                                                                                                                          |
| Statistical methods    | 12  | (a) Describe all statistical methods, including those used to control for confounding. YES                                                                                                                                                                                                                |
|                        |     | (b) Describe any methods used to examine subgroups and interactions. YES                                                                                                                                                                                                                                  |
|                        |     | (c) Explain how missing data were addressed NO                                                                                                                                                                                                                                                            |
|                        |     | (d) <i>Cohort study</i> —If applicable, explain how loss to follow-up was addressed<br><i>Case-control study</i> —If applicable, explain how matching of cases and controls was addressed<br><i>Cross-sectional study</i> —If applicable, describe analytical methods taking account of sampling strategy |
|                        |     | (e) Describe any sensitivity analyses NO                                                                                                                                                                                                                                                                  |
| Results                |     |                                                                                                                                                                                                                                                                                                           |
| Participants           | 13* | (a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed. YES                                                                                                    |
|                        |     | (b) Give reasons for non-participation at each stage NO                                                                                                                                                                                                                                                   |
|                        |     | (c) Consider use of a flow diagram NO                                                                                                                                                                                                                                                                     |
| Descriptive data       | 14* | (a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders. YES                                                                                                                                                             |
|                        |     | (b) Indicate number of participants with missing data for each variable of interest. NO                                                                                                                                                                                                                   |
|                        |     | (c) <i>Cohort study</i> —Summarise follow-up time (eg, average and total amount) NO                                                                                                                                                                                                                       |
| Outcome data           | 15* | <i>Cohort study</i> —Report numbers of outcome events or summary measures over time. YES                                                                                                                                                                                                                  |

|                          |    |                                                                                                                                                                                                                   |
|--------------------------|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                          |    | <i>Case-control study</i> —Report numbers in each exposure category, or summary measures of exposure                                                                                                              |
|                          |    | <i>Cross-sectional study</i> —Report numbers of outcome events or summary measures                                                                                                                                |
| Main results             | 16 | (a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included. YES |
|                          |    | (b) Report category boundaries when continuous variables were categorized YES                                                                                                                                     |
|                          |    | (c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period                                                                                                  |
| Other analyses           | 17 | Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses. YES                                                                                                               |
| <b>Discussion</b>        |    |                                                                                                                                                                                                                   |
| Key results              | 18 | Summarise key results with reference to study objectives. YES                                                                                                                                                     |
| Limitations              | 19 | Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias. YES                                                   |
| Interpretation           | 20 | Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence. YES                                   |
| Generalisability         | 21 | Discuss the generalisability (external validity) of the study results. YES                                                                                                                                        |
| <b>Other information</b> |    |                                                                                                                                                                                                                   |
| Funding                  | 22 | Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based. YES                                                |

Meloy, Davis & Lovette (2001)

| Item No              |   | Recommendation                                                                                                                                                                     |
|----------------------|---|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Title and abstract   | 1 | (a) Indicate the study’s design with a commonly used term in the title or the abstract. YES                                                                                        |
|                      |   | (b) Provide in the abstract an informative and balanced summary of what was done and what was found YES                                                                            |
| Introduction         |   |                                                                                                                                                                                    |
| Background/rationale | 2 | Explain the scientific background and rationale for the investigation being reported YES                                                                                           |
| Objectives           | 3 | State specific objectives, including any prespecified hypotheses. YES                                                                                                              |
| Methods              |   |                                                                                                                                                                                    |
| Study design         | 4 | Present key elements of study design early in the paper YES                                                                                                                        |
| Setting              | 5 | Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection. YES                                               |
| Participants         | 6 | (a) Cohort study—Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up YES                                        |
|                      |   | Case-control study—Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls |

|                              |    |                                                                                                                                                                                                                                                                                                           |
|------------------------------|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                              |    | <i>Cross-sectional study</i> —Give the eligibility criteria, and the sources and methods of selection of participants                                                                                                                                                                                     |
|                              |    | <i>(b) Cohort study</i> —For matched studies, give matching criteria and number of exposed and unexposed. NO                                                                                                                                                                                              |
|                              |    | <i>Case-control study</i> —For matched studies, give matching criteria and the number of controls per case                                                                                                                                                                                                |
| Variables                    | 7  | Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable YES                                                                                                                                                              |
| Data sources/<br>measurement | 8* | For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group YES                                                                                                                  |
| Bias                         | 9  | Describe any efforts to address potential sources of bias YES                                                                                                                                                                                                                                             |
| Study size                   | 10 | Explain how the study size was arrived at. YES                                                                                                                                                                                                                                                            |
| Quantitative<br>variables    | 11 | Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why. YES                                                                                                                                                                         |
| Statistical methods          | 12 | <i>(a)</i> Describe all statistical methods, including those used to control for confounding YES                                                                                                                                                                                                          |
|                              |    | <i>(b)</i> Describe any methods used to examine subgroups and interactions YES                                                                                                                                                                                                                            |
|                              |    | <i>(c)</i> Explain how missing data were addressed. NO                                                                                                                                                                                                                                                    |
|                              |    | <i>(d) Cohort study</i> —If applicable, explain how loss to follow-up was addressed<br><i>Case-control study</i> —If applicable, explain how matching of cases and controls was addressed<br><i>Cross-sectional study</i> —If applicable, describe analytical methods taking account of sampling strategy |
|                              |    | <i>(e)</i> Describe any sensitivity analyses NO                                                                                                                                                                                                                                                           |
| Results                      |    |                                                                                                                                                                                                                                                                                                           |

|                  |     |                                                                                                                                                                                                                  |
|------------------|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Participants     | 13* | (a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed YES            |
|                  |     | (b) Give reasons for non-participation at each stage NO                                                                                                                                                          |
|                  |     | (c) Consider use of a flow diagram NO                                                                                                                                                                            |
| Descriptive data | 14* | (a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders. YES                                                                    |
|                  |     | (b) Indicate number of participants with missing data for each variable of interest YES                                                                                                                          |
|                  |     | (c) <i>Cohort study</i> —Summarise follow-up time (eg, average and total amount) YES                                                                                                                             |
| Outcome data     | 15* | <i>Cohort study</i> —Report numbers of outcome events or summary measures over time YES                                                                                                                          |
|                  |     | <i>Case-control study</i> —Report numbers in each exposure category, or summary measures of exposure                                                                                                             |
|                  |     | <i>Cross-sectional study</i> —Report numbers of outcome events or summary measures                                                                                                                               |
| Main results     | 16  | (a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included YES |
|                  |     | (b) Report category boundaries when continuous variables were categorized YES                                                                                                                                    |
|                  |     | (c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period                                                                                                 |
| Other analyses   | 17  | Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses YES                                                                                                               |

|                          |    |                                                                                                                                                                                |
|--------------------------|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Discussion</b>        |    |                                                                                                                                                                                |
| Key results              | 18 | Summarise key results with reference to study objectives YES                                                                                                                   |
| Limitations              | 19 | Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias YES                 |
| Interpretation           | 20 | Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence YES |
| Generalisability         | 21 | Discuss the generalisability (external validity) of the study results YES                                                                                                      |
| <b>Other information</b> |    |                                                                                                                                                                                |
| Funding                  | 22 | Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based. YES             |

*Meloy et al. (2000)*

| Item No            |   | Recommendation                                                                                             |
|--------------------|---|------------------------------------------------------------------------------------------------------------|
| Title and abstract | 1 | (a) Indicate the study’s design with a commonly used term in the title or the abstract<br>YES              |
|                    |   | (b) Provide in the abstract an informative and balanced summary of what was done and what was found<br>YES |
| Introduction       |   |                                                                                                            |

|                          |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |
|--------------------------|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| Background/rationale     | 2  | Explain the scientific background and rationale for the investigation being reported                                                                                                                                                                                                                                                                                                                                                                                               | YES |
| Objectives               | 3  | State specific objectives, including any prespecified hypotheses                                                                                                                                                                                                                                                                                                                                                                                                                   | YES |
| <b>Methods</b>           |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |
| Study design             | 4  | Present key elements of study design early in the paper                                                                                                                                                                                                                                                                                                                                                                                                                            | YES |
| Setting                  | 5  | Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection                                                                                                                                                                                                                                                                                                                                                    | YES |
| Participants             | 6  | <p>(a) <i>Cohort study</i>—Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up</p> <p><i>Case-control study</i>—Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls</p> <p><i>Cross-sectional study</i>—Give the eligibility criteria, and the sources and methods of selection of participants</p> | YES |
|                          |    | <p>(b) <i>Cohort study</i>—For matched studies, give matching criteria and number of exposed and unexposed</p> <p><i>Case-control study</i>—For matched studies, give matching criteria and the number of controls per case</p>                                                                                                                                                                                                                                                    |     |
| Variables                | 7  | Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable.                                                                                                                                                                                                                                                                                                                                          | YES |
| Data sources/measurement | 8* | For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group                                                                                                                                                                                                                                                                                               | YES |
| Bias                     | 9  | Describe any efforts to address potential sources of bias                                                                                                                                                                                                                                                                                                                                                                                                                          | YES |
| Study size               | 10 | Explain how the study size was arrived at                                                                                                                                                                                                                                                                                                                                                                                                                                          | YES |

|                        |     |                                                                                                                                                                                                   |     |
|------------------------|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| Quantitative variables | 11  | Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why                                                                      | YES |
| Statistical methods    | 12  | (a) Describe all statistical methods, including those used to control for confounding                                                                                                             | YES |
|                        |     | (b) Describe any methods used to examine subgroups and interactions                                                                                                                               |     |
|                        |     | (c) Explain how missing data were addressed                                                                                                                                                       |     |
|                        |     | (d) Cohort study—If applicable, explain how loss to follow-up was addressed                                                                                                                       |     |
|                        |     | Case-control study—If applicable, explain how matching of cases and controls was addressed                                                                                                        |     |
|                        |     | Cross-sectional study—If applicable, describe analytical methods taking account of sampling strategy                                                                                              |     |
|                        |     | (e) Describe any sensitivity analyses                                                                                                                                                             |     |
| Results                |     |                                                                                                                                                                                                   |     |
| Participants           | 13* | (a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed | YES |
|                        |     | (b) Give reasons for non-participation at each stage                                                                                                                                              | NO  |
|                        |     | (c) Consider use of a flow diagram                                                                                                                                                                | NO  |
| Descriptive data       | 14* | (a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders                                                          | YES |
|                        |     | (b) Indicate number of participants with missing data for each variable of interest                                                                                                               | NO  |
|                        |     | (c) Cohort study—Summarise follow-up time (eg, average and total amount)                                                                                                                          |     |
| Outcome data           | 15* |                                                                                                                                                                                                   |     |

|                          |    |                                                                                                                                                                                                              |     |
|--------------------------|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
|                          |    | <i>Cohort study</i> —Report numbers of outcome events or summary measures over time                                                                                                                          | /   |
|                          |    | <i>Case-control study</i> —Report numbers in each exposure category, or summary measures of exposure                                                                                                         | /   |
|                          |    | <i>Cross-sectional study</i> —Report numbers of outcome events or summary measures                                                                                                                           | /   |
| Main results             | 16 | (a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included | YES |
|                          |    | (b) Report category boundaries when continuous variables were categorized                                                                                                                                    | NO  |
|                          |    | (c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period                                                                                             | NO  |
| Other analyses           | 17 | Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses                                                                                                               | NO  |
| <b>Discussion</b>        |    |                                                                                                                                                                                                              |     |
| Key results              | 18 | Summarise key results with reference to study objectives                                                                                                                                                     | YES |
| Limitations              | 19 | Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias                                                   | YES |
| Interpretation           | 20 | Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence                                   | YES |
| Generalisability         | 21 | Discuss the generalisability (external validity) of the study results                                                                                                                                        | YES |
| <b>Other information</b> |    |                                                                                                                                                                                                              |     |

|         |    |                                                                                                                                                               |     |
|---------|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| Funding | 22 | Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based | YES |
|---------|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|

*Mullen et al. (1999)*

| Item No              |   | Recommendation                                                                                                                             |
|----------------------|---|--------------------------------------------------------------------------------------------------------------------------------------------|
| Title and abstract   | 1 | (a) Indicate the study’s design with a commonly used term in the title or the abstract. YES                                                |
|                      |   | (b) Provide in the abstract an informative and balanced summary of what was done and what was found YES                                    |
| Introduction         |   |                                                                                                                                            |
| Background/rationale | 2 | Explain the scientific background and rationale for the investigation being reported YES                                                   |
| Objectives           | 3 | State specific objectives, including any prespecified hypotheses YES                                                                       |
| Methods              |   |                                                                                                                                            |
| Study design         | 4 | Present key elements of study design early in the paper NO                                                                                 |
| Setting              | 5 | Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection YES        |
| Participants         | 6 | (a) Cohort study—Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up NO |

|                              |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|------------------------------|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                              |    | <p><i>Case-control study</i>—Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls</p> <p><i>Cross-sectional study</i>—Give the eligibility criteria, and the sources and methods of selection of participants</p> <hr/> <p><i>(b) Cohort study</i>—For matched studies, give matching criteria and number of exposed and unexposed</p> <p><i>Case-control study</i>—For matched studies, give matching criteria and the number of controls per case</p> |
| Variables                    | 7  | Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable. YES                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Data sources/<br>measurement | 8* | For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group YES                                                                                                                                                                                                                                                                                                                                                                           |
| Bias                         | 9  | Describe any efforts to address potential sources of bias. YES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Study size                   | 10 | Explain how the study size was arrived at. YES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Quantitative<br>variables    | 11 | Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why. YES                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Statistical methods          | 12 | <i>(a)</i> Describe all statistical methods, including those used to control for confounding. YES                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                              |    | <i>(b)</i> Describe any methods used to examine subgroups and interactions YES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                              |    | <i>(c)</i> Explain how missing data were addressed. NO                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                              |    | <p><i>(d) Cohort study</i>—If applicable, explain how loss to follow-up was addressed.</p> <p><i>Case-control study</i>—If applicable, explain how matching of cases and controls was addressed</p> <p><i>Cross-sectional study</i>—If applicable, describe analytical methods taking account of sampling strategy</p>                                                                                                                                                                                                                                             |

|                                          |     |                                                                                                                                                                                                                   |
|------------------------------------------|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (e) Describe any sensitivity analyses NO |     |                                                                                                                                                                                                                   |
| <b>Results</b>                           |     |                                                                                                                                                                                                                   |
| Participants                             | 13* | (a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed. YES            |
|                                          |     | (b) Give reasons for non-participation at each stage. YES                                                                                                                                                         |
|                                          |     | (c) Consider use of a flow diagram. NO                                                                                                                                                                            |
| Descriptive data                         | 14* | (a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders. YES                                                                     |
|                                          |     | (b) Indicate number of participants with missing data for each variable of interest. YES                                                                                                                          |
|                                          |     | (c) <i>Cohort study</i> —Summarise follow-up time (eg, average and total amount)                                                                                                                                  |
| Outcome data                             | 15* | <i>Cohort study</i> —Report numbers of outcome events or summary measures over time                                                                                                                               |
|                                          |     | <i>Case-control study</i> —Report numbers in each exposure category, or summary measures of exposure                                                                                                              |
|                                          |     | <i>Cross-sectional study</i> —Report numbers of outcome events or summary measures                                                                                                                                |
| Main results                             | 16  | (a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included. YES |
|                                          |     | (b) Report category boundaries when continuous variables were categorized. NO                                                                                                                                     |
|                                          |     | (c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period NO                                                                                               |

|                          |    |                                                                                                                                                                                 |
|--------------------------|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Other analyses           | 17 | Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses NO                                                                               |
| <b>Discussion</b>        |    |                                                                                                                                                                                 |
| Key results              | 18 | Summarise key results with reference to study objectives YES                                                                                                                    |
| Limitations              | 19 | Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias YES                  |
| Interpretation           | 20 | Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence. YES |
| Generalisability         | 21 | Discuss the generalisability (external validity) of the study results YES                                                                                                       |
| <b>Other information</b> |    |                                                                                                                                                                                 |
| Funding                  | 22 | Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based. YES              |

*Nijdam-Jones et al. (2018)*

| <b>Item No</b>            |   | <b>Recommendation</b>                                                                               |     |
|---------------------------|---|-----------------------------------------------------------------------------------------------------|-----|
| <b>Title and abstract</b> | 1 | (a) Indicate the study's design with a commonly used term in the title or the abstract              | YES |
|                           |   | (b) Provide in the abstract an informative and balanced summary of what was done and what was found | YES |

|                          |    |                                                                                                                                                                                      |  |     |
|--------------------------|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----|
| <b>Introduction</b>      |    |                                                                                                                                                                                      |  |     |
| Background/rationale     | 2  | Explain the scientific background and rationale for the investigation being reported                                                                                                 |  | YES |
| Objectives               | 3  | State specific objectives, including any prespecified hypotheses                                                                                                                     |  | YES |
| <b>Methods</b>           |    |                                                                                                                                                                                      |  |     |
| Study design             | 4  | Present key elements of study design early in the paper                                                                                                                              |  | YES |
| Setting                  | 5  | Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection                                                      |  | YES |
| Participants             | 6  | (a) Give the eligibility criteria, and the sources and methods of selection of participants                                                                                          |  | YES |
| Variables                | 7  | Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable                                             |  | YES |
| Data sources/measurement | 8* | For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group |  | YES |
| Bias                     | 9  | Describe any efforts to address potential sources of bias                                                                                                                            |  | YES |
| Study size               | 10 | Explain how the study size was arrived at                                                                                                                                            |  | YES |
| Quantitative variables   | 11 | Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why                                                         |  | YES |
| Statistical methods      | 12 | (a) Describe all statistical methods, including those used to control for confounding                                                                                                |  | YES |
|                          |    | (b) Describe any methods used to examine subgroups and interactions                                                                                                                  |  | YES |
|                          |    | (c) Explain how missing data were addressed                                                                                                                                          |  | YES |

|                  |     |                                                                                                                                                                                                              |     |
|------------------|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
|                  |     | (d) If applicable, describe analytical methods taking account of sampling strategy                                                                                                                           | YES |
|                  |     | (e) Describe any sensitivity analyses                                                                                                                                                                        | DK  |
| <b>Results</b>   |     |                                                                                                                                                                                                              |     |
| Participants     | 13* | (a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed            | YES |
|                  |     | (b) Give reasons for non-participation at each stage                                                                                                                                                         | NO  |
|                  |     | (c) Consider use of a flow diagram                                                                                                                                                                           | NO  |
| Descriptive data | 14* | (a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders                                                                     |     |
|                  |     | (b) Indicate number of participants with missing data for each variable of interest                                                                                                                          | NO  |
| Outcome data     | 15* | Report numbers of outcome events or summary measures                                                                                                                                                         | YES |
| Main results     | 16  | (a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included | YES |
|                  |     | (b) Report category boundaries when continuous variables were categorized                                                                                                                                    | NO  |
|                  |     | (c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period                                                                                             | NO  |
| Other analyses   | 17  | Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses                                                                                                               | YES |

| <b>Discussion</b>        |    |                                                                                                                                                                            |     |
|--------------------------|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| Key results              | 18 | Summarise key results with reference to study objectives                                                                                                                   | YES |
| Limitations              | 19 | Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias                 | YES |
| Interpretation           | 20 | Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence | YES |
| Generalisability         | 21 | Discuss the generalisability (external validity) of the study results                                                                                                      | YES |
| <b>Other information</b> |    |                                                                                                                                                                            |     |
| Funding                  | 22 | Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based              | YES |

*Rosenfeld (2003)*

| <b>Item No</b>            |   | <b>Recommendation</b>                                                                                   |
|---------------------------|---|---------------------------------------------------------------------------------------------------------|
| <b>Title and abstract</b> | 1 | (a) Indicate the study's design with a commonly used term in the title or the abstract. YES             |
|                           |   | (b) Provide in the abstract an informative and balanced summary of what was done and what was found YES |

| <b>Introduction</b>      |    |                                                                                                                                                                                                                                                                                                                                                             |
|--------------------------|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Background/rationale     | 2  | Explain the scientific background and rationale for the investigation being reported YES                                                                                                                                                                                                                                                                    |
| Objectives               | 3  | State specific objectives, including any prespecified hypotheses YES                                                                                                                                                                                                                                                                                        |
| <b>Methods</b>           |    |                                                                                                                                                                                                                                                                                                                                                             |
| Study design             | 4  | Present key elements of study design early in the paper YES                                                                                                                                                                                                                                                                                                 |
| Setting                  | 5  | Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection YES                                                                                                                                                                                                                         |
| Participants             | 6  | <p>(a) <i>Cohort study</i>—Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up YES</p> <p><i>Case-control study</i>—Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls</p>  |
|                          |    | <p><i>Cross-sectional study</i>—Give the eligibility criteria, and the sources and methods of selection of participants</p> <p>(b) <i>Cohort study</i>—For matched studies, give matching criteria and number of exposed and unexposed</p> <p><i>Case-control study</i>—For matched studies, give matching criteria and the number of controls per case</p> |
| Variables                | 7  | Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable. YES                                                                                                                                                                                                               |
| Data sources/measurement | 8* | For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group YES                                                                                                                                                                    |
| Bias                     | 9  | Describe any efforts to address potential sources of bias. YES                                                                                                                                                                                                                                                                                              |
| Study size               | 10 | Explain how the study size was arrived at. YES                                                                                                                                                                                                                                                                                                              |

|                        |     |                                                                                                                                                                                                        |
|------------------------|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Quantitative variables | 11  | Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why. YES                                                                      |
| Statistical methods    | 12  | (a) Describe all statistical methods, including those used to control for confounding. YES                                                                                                             |
|                        |     | (b) Describe any methods used to examine subgroups and interactions YES                                                                                                                                |
|                        |     | (c) Explain how missing data were addressed. NO                                                                                                                                                        |
|                        |     | (d) <i>Cohort study</i> —If applicable, explain how loss to follow-up was addressed. NO                                                                                                                |
|                        |     | <i>Case-control study</i> —If applicable, explain how matching of cases and controls was addressed                                                                                                     |
|                        |     | <i>Cross-sectional study</i> —If applicable, describe analytical methods taking account of sampling strategy                                                                                           |
|                        |     | (e) Describe any sensitivity analyses                                                                                                                                                                  |
| Results                |     |                                                                                                                                                                                                        |
| Participants           | 13* | (a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed. YES |
|                        |     | (b) Give reasons for non-participation at each stage. NO                                                                                                                                               |
|                        |     | (c) Consider use of a flow diagram. NO                                                                                                                                                                 |
| Descriptive data       | 14* | (a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders. YES                                                          |
|                        |     | (b) Indicate number of participants with missing data for each variable of interest. YES                                                                                                               |
|                        |     | (c) <i>Cohort study</i> —Summarise follow-up time (eg, average and total amount)                                                                                                                       |
| Outcome data           | 15* | <i>Cohort study</i> —Report numbers of outcome events or summary measures over time YES                                                                                                                |

|                          |    |                                                                                                                                                                                                                   |
|--------------------------|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                          |    | <i>Case-control study</i> —Report numbers in each exposure category, or summary measures of exposure                                                                                                              |
|                          |    | <i>Cross-sectional study</i> —Report numbers of outcome events or summary measures                                                                                                                                |
| Main results             | 16 | (a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included. YES |
|                          |    | (b) Report category boundaries when continuous variables were categorized. YES                                                                                                                                    |
|                          |    | (c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period                                                                                                  |
| Other analyses           | 17 | Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses                                                                                                                    |
| <b>Discussion</b>        |    |                                                                                                                                                                                                                   |
| Key results              | 18 | Summarise key results with reference to study objectives YES                                                                                                                                                      |
| Limitations              | 19 | Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias YES                                                    |
| Interpretation           | 20 | Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence. YES                                   |
| Generalisability         | 21 | Discuss the generalisability (external validity) of the study results YES                                                                                                                                         |
| <b>Other information</b> |    |                                                                                                                                                                                                                   |
| Funding                  | 22 | Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based. YES                                                |

*Sandberg, McNiel & Binder (1998)*

| Item No              |   | Recommendation                                                                                      |     |
|----------------------|---|-----------------------------------------------------------------------------------------------------|-----|
| Title and abstract   | 1 | (a) Indicate the study’s design with a commonly used term in the title or the abstract              | YES |
|                      |   | (b) Provide in the abstract an informative and balanced summary of what was done and what was found | YES |
| Introduction         |   |                                                                                                     |     |
| Background/rationale | 2 | Explain the scientific background and rationale for the investigation being reported                | YES |
| Objectives           | 3 | State specific objectives, including any prespecified hypotheses                                    | YES |
| Methods              |   |                                                                                                     |     |
| Study design         | 4 | Present key elements of study design early in the paper                                             | YES |

|                              |    |                                                                                                                                                                                      |             |
|------------------------------|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| Setting                      | 5  | Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection                                                      | Y<br>E<br>S |
| Participants                 | 6  | (a) Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls                  | Y<br>E<br>S |
|                              |    | (b) For matched studies, give matching criteria and the number of controls per case                                                                                                  | N<br>O      |
| Variables                    | 7  | Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable                                             | Y<br>E<br>S |
| Data sources/<br>measurement | 8* | For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group | Y<br>E<br>S |
| Bias                         | 9  | Describe any efforts to address potential sources of bias                                                                                                                            | Y<br>E<br>S |
| Study size                   | 10 | Explain how the study size was arrived at                                                                                                                                            | Y<br>E<br>S |
| Quantitative<br>variables    | 11 | Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why                                                         | Y<br>E<br>S |
| Statistical methods          | 12 | (a) Describe all statistical methods, including those used to control for confounding.                                                                                               | Y<br>E<br>S |

|                  |     |                                                                                                                                                                                                   |             |
|------------------|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
|                  |     | (b) Describe any methods used to examine subgroups and interactions                                                                                                                               | N<br>O      |
|                  |     | (c) Explain how missing data were addressed                                                                                                                                                       | N<br>O      |
|                  |     | (d) If applicable, explain how matching of cases and controls was addressed                                                                                                                       | N<br>O      |
|                  |     | (e) Describe any sensitivity analyses                                                                                                                                                             | N<br>O      |
| <b>Results</b>   |     |                                                                                                                                                                                                   |             |
| Participants     | 13* | (a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed | Y<br>E<br>S |
|                  |     | (b) Give reasons for non-participation at each stage                                                                                                                                              | N<br>O      |
|                  |     | (c) Consider use of a flow diagram                                                                                                                                                                | N<br>O      |
| Descriptive data | 14* | (a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders                                                          | Y<br>E<br>S |
|                  |     | (b) Indicate number of participants with missing data for each variable of interest                                                                                                               | N<br>O      |
| Outcome data     | 15* | Report numbers in each exposure category, or summary measures of exposure                                                                                                                         | Y<br>E<br>S |

|                          |    |                                                                                                                                                                                                              |             |
|--------------------------|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| Main results             | 16 | (a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included | Y<br>E<br>S |
|                          |    | (b) Report category boundaries when continuous variables were categorized                                                                                                                                    | N<br>O      |
|                          |    | (c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period                                                                                             | N<br>O      |
| Other analyses           | 17 | Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses                                                                                                               | Y<br>E<br>S |
| <b>Discussion</b>        |    |                                                                                                                                                                                                              |             |
| Key results              | 18 | Summarise key results with reference to study objectives                                                                                                                                                     | Y<br>E<br>S |
| Limitations              | 19 | Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias                                                   | Y<br>E<br>S |
| Interpretation           | 20 | Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence                                   | Y<br>E<br>S |
| Generalisability         | 21 | Discuss the generalisability (external validity) of the study results                                                                                                                                        | Y<br>E<br>S |
| <b>Other information</b> |    |                                                                                                                                                                                                              |             |

|         |    |                                                                                                                                                               |             |
|---------|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| Funding | 22 | Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based | Y<br>E<br>S |
|---------|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|

*Strand & McEwan (2012)*

| Item No              |   | Recommendation                                                                                                                  |     |
|----------------------|---|---------------------------------------------------------------------------------------------------------------------------------|-----|
| Title and abstract   | 1 | (a) Indicate the study’s design with a commonly used term in the title or the abstract                                          | YES |
|                      |   | (b) Provide in the abstract an informative and balanced summary of what was done and what was found                             | YES |
| Introduction         |   |                                                                                                                                 |     |
| Background/rationale | 2 | Explain the scientific background and rationale for the investigation being reported                                            | YES |
| Objectives           | 3 | State specific objectives, including any prespecified hypotheses                                                                | YES |
| Methods              |   |                                                                                                                                 |     |
| Study design         | 4 | Present key elements of study design early in the paper                                                                         | YES |
| Setting              | 5 | Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection | YES |
| Participants         | 6 | (a) Give the eligibility criteria, and the sources and methods of selection of participants                                     | YES |

|                              |     |                                                                                                                                                                                                   |     |
|------------------------------|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| Variables                    | 7   | Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable                                                          | YES |
| Data sources/<br>measurement | 8*  | For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group              | YES |
| Bias                         | 9   | Describe any efforts to address potential sources of bias                                                                                                                                         | YES |
| Study size                   | 10  | Explain how the study size was arrived at                                                                                                                                                         | YES |
| Quantitative<br>variables    | 11  | Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why                                                                      | YES |
| Statistical methods          | 12  | (a) Describe all statistical methods, including those used to control for confounding                                                                                                             | YES |
|                              |     | (b) Describe any methods used to examine subgroups and interactions                                                                                                                               | NO  |
|                              |     | (c) Explain how missing data were addressed                                                                                                                                                       | NO  |
|                              |     | (d) If applicable, describe analytical methods taking account of sampling strategy                                                                                                                | NO  |
|                              |     | (e) Describe any sensitivity analyses                                                                                                                                                             | NO  |
| Results                      |     |                                                                                                                                                                                                   |     |
| Participants                 | 13* | (a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed | YES |
|                              |     | (b) Give reasons for non-participation at each stage                                                                                                                                              | NO  |
|                              |     | (c) Consider use of a flow diagram                                                                                                                                                                | NO  |
| Descriptive data             | 14* | (a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders                                                          | YES |

|                          |     |                                                                                                                                                                                                              |     |
|--------------------------|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
|                          |     | (b) Indicate number of participants with missing data for each variable of interest                                                                                                                          | NO  |
| Outcome data             | 15* | Report numbers of outcome events or summary measures                                                                                                                                                         | YES |
| Main results             | 16  | (a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included | YES |
|                          |     | (b) Report category boundaries when continuous variables were categorized                                                                                                                                    | NO  |
|                          |     | (c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period                                                                                             | NO  |
| Other analyses           | 17  | Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses                                                                                                               | YES |
| <b>Discussion</b>        |     |                                                                                                                                                                                                              |     |
| Key results              | 18  | Summarise key results with reference to study objectives                                                                                                                                                     | YES |
| Limitations              | 19  | Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias                                                   | YES |
| Interpretation           | 20  | Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence                                   | YES |
| Generalisability         | 21  | Discuss the generalisability (external validity) of the study results                                                                                                                                        | YES |
| <b>Other information</b> |     |                                                                                                                                                                                                              |     |
| Funding                  | 22  | Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based                                                | YES |

Whyte et al. (2008)

|                      | Item No | Recommendation                                                                                                                           |     |
|----------------------|---------|------------------------------------------------------------------------------------------------------------------------------------------|-----|
| Title and abstract   | 1       | (a) Indicate the study’s design with a commonly used term in the title or the abstract                                                   | YES |
|                      |         | (b) Provide in the abstract an informative and balanced summary of what was done and what was found                                      | YES |
| Introduction         |         |                                                                                                                                          |     |
| Background/rationale | 2       | Explain the scientific background and rationale for the investigation being reported                                                     | YES |
| Objectives           | 3       | State specific objectives, including any prespecified hypotheses                                                                         | YES |
| Methods              |         |                                                                                                                                          |     |
| Study design         | 4       | Present key elements of study design early in the paper                                                                                  | YES |
| Setting              | 5       | Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection          | YES |
| Participants         | 6       | (a) Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up               | YES |
|                      |         | (b) For matched studies, give matching criteria and number of exposed and unexposed                                                      | NO  |
| Variables            | 7       | Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable | YES |

|                              |     |                                                                                                                                                                                                   |     |
|------------------------------|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| Data sources/<br>measurement | 8*  | For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group              | YES |
| Bias                         | 9   | Describe any efforts to address potential sources of bias                                                                                                                                         | YES |
| Study size                   | 10  | Explain how the study size was arrived at                                                                                                                                                         | YES |
| Quantitative<br>variables    | 11  | Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why                                                                      | YES |
| Statistical methods          | 12  | (a) Describe all statistical methods, including those used to control for confounding                                                                                                             | YES |
|                              |     | (b) Describe any methods used to examine subgroups and interactions                                                                                                                               | YES |
|                              |     | (c) Explain how missing data were addressed                                                                                                                                                       | NO  |
|                              |     | (d) If applicable, explain how loss to follow-up was addressed                                                                                                                                    | NO  |
|                              |     | (e) Describe any sensitivity analyses                                                                                                                                                             | NO  |
| Results                      |     |                                                                                                                                                                                                   |     |
| Participants                 | 13* | (a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed | YES |
|                              |     | (b) Give reasons for non-participation at each stage                                                                                                                                              | NO  |
|                              |     | (c) Consider use of a flow diagram                                                                                                                                                                | NO  |
| Descriptive data             | 14* | (a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders                                                          | YES |
|                              |     | (b) Indicate number of participants with missing data for each variable of interest                                                                                                               | YES |
|                              |     | (c) Summarise follow-up time (eg, average and total amount)                                                                                                                                       | NO  |
| Outcome data                 | 15* | Report numbers of outcome events or summary measures over time                                                                                                                                    | YES |

|                          |    |                                                                                                                                                                                                              |     |
|--------------------------|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| Main results             | 16 | (a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included | YES |
|                          |    | (b) Report category boundaries when continuous variables were categorized                                                                                                                                    | YES |
|                          |    | (c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period                                                                                             | NO  |
| Other analyses           | 17 | Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses                                                                                                               | YES |
| <b>Discussion</b>        |    |                                                                                                                                                                                                              |     |
| Key results              | 18 | Summarise key results with reference to study objectives                                                                                                                                                     | YES |
| Limitations              | 19 | Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias                                                   | YES |
| Interpretation           | 20 | Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence                                   | YES |
| Generalisability         | 21 | Discuss the generalisability (external validity) of the study results                                                                                                                                        | YES |
| <b>Other information</b> |    |                                                                                                                                                                                                              |     |
| Funding                  | 22 | Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based                                                | YES |