Research Note / Note de recherche

Research Protocol for Systematic Review and Meta-Analysis of Elder Abuse Prevalence Studies*

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RÉSUMÉ

La maltraitance des personnes âgées est un important problème de santé publique et de droits de l'homme. Néanmoins, notre connaissance de la veritable ampleur du phénomène demeure limitée. Pour y remédier, nous allons procéder à une revue systématique et une méta-analyse des études de prevalence de la maltraitance des personnes âgées dans le monde entier. Ce protocole décrit l'approche méthodologique qui sera adoptée pour la réalisation de la revue systématique et de la méta-analyse. En particulier, le protocole décrit le développement des stratégies de recherche et des critères pour identifier et sélectionner les études de prévalence ainsi que la façon dont les données des études sélectionnées seront extraites pour l'analyse. Le protocole décrit également l'approche analytique qui sera utilisée pour calculer les estimations de prevalence et l'utilisation de méta-régression pour évaluer la façon dont les caractéristiques des études influencent les estimations de la prévalence. Ce protocole est conforme au "Preferred Reporting Items for Systematic reviews and Meta-Analysis" – ou PRISMA – et a été enregistré auprès du registre de revues systématique PROSPERO International Prospective Register.

ABSTRACT

Elder abuse is an important public health and human rights issue, yet its true extent is not well understood. To address this, we will conduct a systematic review and meta-analysis of elder abuse prevalence studies from around the world. This protocol describes the methodological approach to be adopted for conducting this systematic review and meta-analysis. In particular, the protocol describes the search strategies and eligibility criteria to be used to identify and select studies and how data from the selected studies will be extracted for analysis. The protocol also describes the analytical approach that will be used to calculate pooled prevalence estimates and discusses the use of meta-regression to assess how studies' characteristics influence the prevalence estimates. This protocol conforms to the Preferred Reporting Items for Systematic reviews and Meta-Analysis – or PRISMA – guidelines and has been registered with the PROSPERO International Prospective Register of systematic reviews.

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* We thank George Leeson and Kate Hamlin from the Oxford Institute of Population Ageing, University of Oxford, for their comments and suggestions on this research protocol. Thank you also to the Oxford Martin School for providing the James Martin Visiting Fellowship to conduct this research at the Oxford Institute of Population Ageing.

Contributors: YY conceived of the systematic review and meta-analysis, designed the protocol, drafted the manuscript, developed the search strategy, and pilot searched the databases and data extraction criteria. CM contributed to the development of the review protocol, search strategy, selection criteria, risk of bias assessment strategy, data extraction criteria, and gave statistical advice, and provided critical revision of the manuscript. ZDG and KHW contributed to the development of the search strategy, and provided statistical advice and critical revision of the manuscript. All authors read, provided feedback, and approved the final version of the manuscript.

Funding: The review is funded by the Doctoral Fellowship that was awarded from the Social Sciences and Humanities Research Council of Canada (SSHRC), the University of Southern California (USC), and the World Health Organization (WHO) to support the collection of primary data, data management, and analyses by YY. The funders (i.e., SSHRC, USC, WHO) will have no input on the interpretation or publication of study results.

Manuscript received: / manuscrit reçu : 03/11/15

Manuscript accepted: / manuscrit accepté : 26/08/16

Mots clés : vieillissement, protocole, maltraitance, prévalence, revue systématique, méta-analyse

Keywords: aging, research protocols, elder abuse, prevalence, systematic review, meta-analysis

https://doi.org/10.1017/S0714980817000137 Published online by Cambridge University Press

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Prevalence of Elder Abuse

Elder abuse – sometimes also termed elder mistreatment – is a serious global human rights and public health problem that requires urgent action (World Health Organization [WHO], 2002). Five major subtypes are generally recognized: psychological, physical, sexual, financial abuse, and neglect. Despite receiving increasing attention in recent decades, the field is still in its infancy (Walsh & Yon, 2012). Although there is no consensus on the definition of elder abuse, it is generally defined as "a single, or repeated act, or lack of appropriate action, occurring within any relationship where there is an expectation of trust which causes harm or distress to an older person" (WHO, 2002, p. 3). It is estimated that roughly 1 in 10 older people experience abuse every month, and the rates may be higher for those living in institutional settings. The predicted rates for elder abuse may increase as more and more countries experience population aging (WHO, 2016).

Elder abuse can result in serious consequences including physical injuries (Lachs & Pillemer, 2004; Mouton & Espino, 1999), intense emotional and psychological distress (Comijs, Penninx, Knipscheer, & van Tilburg, 1999; Weeks & LeBlanc, 2011), decline in cognitive functioning (Dong, Simon, Beck, & Evans, 2013), financial devastation, as well as the loss of family solidarity and trust (Pillemer, Connolly, Breckman, Spreng, & Lachs, 2015). Elder abuse affects not only the victims but also the family and the larger society. These negative health, economic, and social outcomes can further exacerbate existing illness leading to the increased risk for institutionalization, hospitalization, morbidity, and mortality (Baker, 2007; Baker et al., 2009; Dong & Simon, 2013; Dong et al., 2009; Lachs, William, O'Brien, & Pillemer, 1998; Schofield, Powers, & Loxton, 2013).

Despite the prevalence and serious consequences of elder abuse, there are major gaps in the field. For instance, the lack of consensus on the definition of elder abuse has led to measurement challenges, which has resulted in inconsistent prevalence estimates. There are currently few reliable and consistent global, regional, and country-level prevalence estimates. Such gaps and inconsistencies ultimately hinder the development of effective intervention programs. To address the need for prevalence estimates, we will conduct a systematic review and meta-analysis of elder abuse prevalence studies. The meta-analysis will allow us to better estimate the prevalence of elder abuse and to investigate how studies' characteristics such as sample and procedural moderators (e.g., gender, geographical region, method of measurement) can influence the prevalence estimates. To accomplish this, a rigorous and comprehensive methodology is crucial to identify relevant studies. Hence, the focus of this article is to describe the method that we will use to perform the searches, select relevant studies, appraise their quality, and analyse and synthesize the findings for the systematic review and meta-analysis of elder abuse prevalence studies.

Rationale

The importance of examining elder abuse is highlighted in targets 5.2 and 16.2 of the 17 *sustainable development goals*, which were adopted by the United Nations General Assembly in September 2015. These targets call for the elimination of violence against women and for a significant reduction in all forms of violence, including elder abuse. Recently, the World Health Organization (WHO)-led Violence Prevention Alliance carried out a research priority–setting exercise for all forms of interpersonal violence, including elder abuse. It was found that "describing the nature, magnitude, distribution, & consequences of violence" was the most important priority for elder abuse and neglect (Mikton et al., in press). Moreover, the lack of research and action on elder abuse was highlighted in WHO's *Global Status Report on Violence Prevention*, which surveyed 133 countries to identify gaps in national responses to violence. This report revealed that 41 per cent of countries have national plans to address elder abuse, whereas only 17 per cent have conducted surveys to assess the extent of the problem (WHO, 2014).

Similarly, in the United States, the 2015 White House Conference on Aging identified elder abuse as one of four major priorities on aging issues (Pillemer et al., 2015). In addition, the U.S. Department of Justice conducted a survey of experts to rank and prioritize the most salient gaps in knowledge on elder abuse. It was found that "definitions and measurement" was the most frequently selected gap by both the research and practice expert communities (Stahl, 2015). These findings are

https://doi.org/10.1017/S0714980817000137 Published online by Cambridge University Press

also consistent with the U.S. Elder Justice Roadmap, which identified research as one of three key domains to reduce the risk of elder abuse (U.S. Department of Justice and Department of Health and Human Resources, 2014). In Canada, more than 90 per cent of Canadians reported that addressing elder abuse is the most important intervention in the field of aging for governments (Government of Canada, 2015).

Understanding the magnitude of elder abuse is an important step in the public health approach to violence prevention. However, the continued lack of consensus in defining and measuring elder abuse has resulted in wide variations in reported prevalence rates of abuse. For example, national estimates of one-year abuse prevalence varied from lows of 2.6 per cent in the United Kingdom (O'Keeffe et al., 2007) and 4 per cent in Canada (Podnieks, Pillemer, Nicholson, Shillington, & Frizzel, 1990) to highs of 14 per cent in India (Chokkanathan & Lee, 2005) and 18.4 per cent in Israel (Lowenstein, Eisikovits, Band-Winterstein, & Enosh, 2009). Similarly, the limited number of studies on elder abuse in institutional settings has shown wide variability in prevalence estimates (Ogioni et al., 2007; Ramsey-Klawsnik, Teaster, Mendiondo, Marcum, & Abner, 2008). These estimates may also vary according to types of institutions such as nursing homes and long-term care facilities, or by the nature of the abuse such as residents-to-residents, family-to-residents, or staff-to-residents abuse (McDonald et al., 2012).

To date, only a handful of systematic reviews exist to quantify and synthesize elder abuse prevalence studies. However, these reviews provided only narrative synthesis and did not employ sufficient methodological rigor in estimating prevalence rates. Moreover, individual studies are often identified as best evidence for prevalence estimates. For example, in their review, Cooper, Selwood, and Livingston (2008) identified Oh et al.'s (2006) estimate of 1 in 17, or 6 per cent, as best evidence for abuse in the past month. Given the wide range of studies with varying prevalence estimates, however, a general estimate of 1 in 10 older people in the past year has been used as an unofficial estimate for global elder abuse prevalence rate (Burnes et al., 2015; WHO, 2016).

Similarly, Dong (2015) conducted a small-scale systematic review of prevalence studies and grouped estimates by continents. These rates provided insights into geographical differences in prevalence rates which ranged as high as 36 per cent in Asia (Wu et al., 2012), 44 per cent in Africa (Abdel Rahman & Gaafary, 2012), and 61 per cent in Europe (Ajdukovic, Ogresta, & Rusac, 2009). These variations, which may stem from cultural, social, or methodological differences, further underscore the need and importance of meta-analysis. We aim to disentangle the wide variations in prevalence estimates by investigating the influence of studies' sample and procedural moderators (e.g., gender, geographical region, method of measurement) on elder abuse.

Despite the existence of some systematic reviews, to the authors' knowledge, this research will be the first of its kind to use meta-analysis on elder abuse research. Rather than conducting a narrative synthesis, which is prone to bias, meta-analysis has the advantage of using statistical methods to synthesize estimates from the selected studies. One of the goals of a statistical synthesis is to examine how prevalence estimates vary from one study to another. In other words, meta-analysis provides a degree of consistency by quantifying the extent of the variation (Borenstein, Hedges, Higgins, & Rothstein, 2009).

Although it remains unclear how sample and procedural moderators can explain differences in prevalence estimates for elder abuse, findings from meta-analytical studies on childhood sexual abuse have indicated that studies using random sampling, compared to convenience sampling, as well as those with larger sample sizes, compared to smaller ones, are more likely to produce lower prevalence estimates (Goldman & Padayachi, 2000; Stoltenborgh, Bakermans-Kranenburg, & Van IJzendoorn, 2013; Stoltenborgh, Van IJzendoorn, Euser, & Bakermans-Kranenburg, 2011). The use of meta-analysis has been effective for providing estimates of prevalence and risk of physical and sexual violence for adults with disabilities (Hughes et al., 2012) and children with disabilities (Jones et al., 2012). Likewise, pooled prevalence estimates for neglect (Stoltenborgh et al., 2013) and emotional abuse (Stoltenborgh, Bakermans-Kranenburg, Alink, & Van IJzendoorn, 2012) have been conducted for childhood abuse. Similarly the use of meta-analysis can be applied to advance the field of elder abuse research.

Findings from this research can provide valuable insights into measuring and monitoring elder abuse. The goal of the systematic review and meta-analysis is to provide a comprehensive synthesis of existing prevalence studies on elder abuse. Better estimates of prevalence can contribute to achieving the elder abuse–related targets of the sustainable development goals and help address the research priorities identified by the WHO and the U.S. government. Given the potential importance of such a systematic review and meta-analysis, this protocol provides an in-depth description of the research objectives as well as the methodological and analytical approaches that we will use to identify, appraise, and synthesize the relevant prevalence studies.

Objectives

The objectives of this study are as follows: (1) to conduct a systematic review and meta-analysis that will improve on current estimates of the prevalence of elder abuse and its sub-types; and (2) to examine the influence of

https://doi.org/10.1017/S0714980817000137 Published online by Cambridge University Press

studies' sample and procedural characteristics on prevalence estimates.

Review Questions

The systematic review and meta-analysis will seek to address the following main research questions: (1) What are the prevalence estimates for elder abuse and its subtypes in both community and institutional populations at three levels: globally, regionally (using WHO-defined regions), and nationally? (2) What are the characteristics of the studies and methods that are associated with prevalence rates in community settings?

Methods

This review protocol has been published in the PROSPERO International Prospective Register of systematic reviews (www.crd.york.ac.uk/PROSPERO), registration number CRD42015029197. The protocol is reported according to the Preferred Reporting Items for Systematic reviews and Meta-Analyses Protocol (PRISMA-P; Moher, Liberati, Tetzlaff, Altman, & The PRISMA Group, 2009; Shamseer et al., 2015).

Eligibility Criteria

This protocol will identify studies on elder abuse prevalence published from inception to December 2015 in both the community and institutional settings. To ensure it is as up-to-date as possible, relevant studies will be identified using the same four-step search strategies (described below) after searches are completed. All studies that meet the listed eligibility criteria will be selected for further review and synthesis. If multiple publications reported on the same study, the publication that provided the maximum amount of data will be included in the meta-analysis.

Although many developed countries have used the chronological age of 65 and older to define an "older person", this protocol will use the United Nations–agreed cut-off age of 60 years and over for an older person (WHO, 2015). Moreover, the protocol will not place any language restriction in the eligibility criteria, thereby maximizing the number of prevalence studies on elder abuse. Additional criteria to be considered for selecting studies in this research will include the following items.

Inclusion Criteria

Criteria for inclusion in the review are as follows.

1. Community samples using cross-sectional, case control, or cohort (including longitudinal) designs that provide estimates of elder abuse prevalence at a national or sub-national level (e.g., state, province, counties, districts, and large cities [except in the United States, where states are the smallest unit of data considered, due to the large number of prevalence studies and our aim of estimating national, rather than sub-national, level prevalence.]).
2. Administrative (or service-based) data that provide estimates of elder abuse prevalence at a national or sub-national level (e.g., state, province, state, country, district, large city, clinics, emergency department, and other social/health services) with samples of at least 20 people; or
3. Any samples in institutional settings (such as residential care and nursing facilities) that provide prevalence estimates at any national and sub-national level (e.g. state, province, state, country, district, large city).

Exclusion Criteria

Exclusion criteria for the review consist of the following three items.

1. Reviews (narrative and systematic, conference proceedings, case reports, qualitative studies, editorials, opinion papers, and letters).
2. Studies focusing exclusively on elder self-neglect or homicide.
3. Studies focusing on a very specific sub-population (e.g., abuse among people with a specify disability/condition or specific occupational groups).

Information Sources

We will apply a comprehensive search strategy to find both published and unpublished studies using both bibliographic databases and the grey literature. The search strategy was developed on the basis of examining existing systematic reviews of elder abuse and other types of interpersonal violence, including childhood abuse and intimate partner violence to identify relevant bibliographic databases and search terms. Additional search terms were included in consultation with an information specialist (librarian) at the WHO with extensive experience in systematic reviews.

We developed, finalized, and adapted the search strategy for each database with a combination of free text and controlled vocabulary keywords, including the following terms: older adults; frail elderly; elderly; seniors; elder abuse; elder neglect; elder mistreatment; elder maltreatment; domestic violence; intimate partner violence; abuse; violence; aggression; harmful behavior; anger; rape; hostility; conflict; verbal abuse; physical abuse; sexual abuse; emotional abuse; patient abuse; prevalence; incidence; epidemiology; nursing homes; assisted living; residential care institutions; residential facilities; health facilities; skilled nursing facilities. Grey literature searches will be conducted using the above keywords with Google. Search results

https://doi.org/10.1017/S0714980817000137 Published online by Cambridge University Press

of the first 20 pages of Google will be reviewed and screened for eligibility.

Identifying Research Evidence Based on a Four-Step Search Strategy

This protocol aims to comprehensively identify elder abuse prevalence studies in the community and institutional settings. To accomplish this, our protocol will employ a four-step search strategy encompassing academic bibliographies to internet searches as well as consultations with experts:

In step 1, studies will be identified using a predefined search strategy (see online supplementary appendix). To comprehensively identify studies published from inception (i.e., the 1980s) to the present that reported prevalence estimates of abuse and neglect against older adults, the search will include the following bibliographic databases: PubMed (1966–); PsycINFO (1806–); CINAHL (1982–); EMBASE (1974–); MEDLINE via OVID (1946–); Sociological Abstracts (1952–); ERIC (1966–); AgeLine (1978–); Social Work Abstracts (1965–); International Bibliography of the Social Sciences (1987–); Social Services Abstracts (1979–); ProQuest Criminal Justice (1981–); ASSIA (1987–); Dissertations & Theses Full Text; and Dissertations & Theses Global.

In step 2, screening will be performed on the reference lists of retrieved articles, dissertations, and other reviews on elder abuse and neglect for relevant studies based on the aforementioned eligibility criteria.

In step 3, searching will be conducted of web-based platforms for studies using the above keywords in specialized journals on elder abuse such as the *Journal of Elder Abuse & Neglect* (JEAN) and Google search for grey literature as well as using the WHO Global Health Library for scientific literature in developed and developing countries in different languages. The Library consists of several regional databases including the African Index Medicus (AIM), Latin-American and Caribbean Health Sciences Literature (LILACS), Index Medicus for the Eastern Mediterranean Region (IMEMR), Index Medicus for South-East Asia Region (IMSEAR), and Western Pacific Region Index Medicus (WPRIM).

Finally, in step 4, email consultations will be conducted with experts in the area of elder abuse and other interpersonal violence in each of the six WHO regions (i.e., Africa, Americas, South-East Asia, Europe, Eastern Mediterranean, and Western Pacific) as well as with the regional representatives of the International Network for the Prevention of Elder Abuse (INPEA) in Africa, Asia, Europe, Latin America & Caribbean, Middle East & North Africa, and North America and Oceania. We plan to contact and follow up with a maximum of three email attempts to the experts. Additional studies identified through these consultations will also be screened according to the eligibility criteria.

Study Records

Data Management

All bibliographic database citations retrieved using the search strategy will be imported into Endnote (Endnote X7, Thomson Reuters, San Francisco, Calif.) to manage and delete duplicate records. Studies retrieved from reference lists of retrieved articles, Google search, Global Health Library, and experts' consultations will be entered into a Microsoft Excel spreadsheet for de-duplication and screening.

Selection Process

Screening will be performed in two stages: screening of titles and abstracts, followed by the retrieval and screening of full-text articles using the inclusion and exclusion criteria. We will contact the study authors for full-text articles with the maximum of three attempts for any articles that we are unable to retrieve. Throughout the screening process, two primary independent reviewers will assess the articles. Any disagreements that arise between the reviewers will be resolved through discussion, or with a third reviewer. Cohen's kappa will be used to test for inter-rater reliability. Data will be analysed using the Statistical Package for Social Sciences (SPPS Statistics 21) software. Non-eligible articles will be excluded, and reasons for exclusion will be recorded. A flowchart will be used to trace the overall process.

Data Collection Process

Two reviewers will extract data from the selected studies. The first reviewer will extract all the articles (i.e., 100%); the second reviewer will crosscheck all articles for accuracy and independently extract 20 per cent of all the articles. Disagreements will be resolved by discussion between the reviewers or with a third reviewer. Since the protocol will explore how studies' procedural moderators such as definitions and measurements of elder abuse influence prevalence estimates, this protocol will extract the definitions used in the studies under consideration and assess how closely they match the five major sub-types of abuse based on the definitions from the Centers for Disease Control and Prevention (CDC).

The CDC (2015) defined each of these sub-types as follows: Psychological/emotional abuse refers to "behaviors that harm an elder's self-worth or emotional well-being. Examples include name calling, scaring, embarrassing, destroying property, or not letting the elder see friends and family." Physical abuse refers to "when an elder is injured as a result

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of hitting, kicking, pushing, slapping, burning, or other show of force." Sexual abuse "involves forcing an elder to take part in a sexual act when the elder does not or cannot consent." Financial abuse is defined as "illegally misusing an elder's money, property, or assets". Neglect is defined as the "failure to meet an elder's basic needs. These needs include food, housing, clothing, and medical care." Where possible and if there are enough studies, we will calculate prevalence estimates of other forms of elder abuse.

We developed two separate data extraction strategies for the review on the basis of similar strategies from existing systematic reviews of elder abuse as well as other types of interpersonal violence. In particular, given the differences in abuse settings, we created separate data extraction strategies for abuse in the community and the institutional settings. In addition, we developed glossaries to explain the types of data being extracted. Both strategies will be pilot tested and refined based on selected studies that met the eligibility criteria.

Data Items

We will extract three main categories of data: (1) characteristics of the samples; (2) procedural and methodological characteristics of each study; (3) prevalence estimates for any elder abuse and each sub-type of elder abuse. For both community and institutional settings, data being extracted will include (1) geographical location and regional classification of the studies (according to WHO regions); (2) country's income classification (according to the World Bank classification); (3) geographic settings (i.e., urban, rural, etc.); (4) racial/ethnicities; (5) age; (6) types of abusers; (7) gender distribution; (8) definition of abuse; (9) number of items assessing abuse; (10) prevalence period; (11) type of instrument/measurement used to assess abuse (i.e., standardized measurement or self-developed); (12) evidence of reliability and/or validity of the measurement instrument; (13) method of data collection (e.g., face-to-face interview, telephone interview, dossier, and informant reports); (14) context in which the instrument(s) was administered; (15) person reporting abuse (i.e., victims or informant); (16) unit of analysis (i.e., older person, staff, etc.); (17) sampling procedures (e.g., randomized vs. convenience sampling); (18) sample size; (19) response rate; (20) study design (e.g., retrospective, prospective and mixture of the design); (21) year of publication; (22) type of publication (e.g., journal, dissertation, etc.), and (23) language of the selected studies.

For institutional settings, additional data will be extracted including presence and types of cognitive and physical impairments as well as facility size (i.e., small [less than 60 beds], large [more than 60 beds]). Moreover, since not all eligible studies will have all the relevant data for extraction, we plan to contact the corresponding authors to request missing information with a maximum of three email attempts. Where possible, and if necessary, additional analyses will be performed to aid review and analyses. Included in the data extraction strategy is the assessment for risk of bias. This will be accomplished by utilizing standardized assessment tools (see section on risk of bias in individual studies).

Outcomes and Prioritization

Primary Outcomes

This research has three primary outcomes, listed below, which contribute to identifying gaps in the availability of prevalence data by region, country, and type of abuse.

1. Global, regional, and country-level prevalence estimates for elder abuse and its sub-types – psychological/emotional, physical, sexual, and financial abuse and neglect – in the community among women and men aged 60 and older.
2. Global, regional, and country-level prevalence and incidence estimates for elder abuse and its sub-types – psychological/emotional, physical, sexual, and financial abuse and neglect – in the institutions among women and men aged 60 and older.
3. Examination of associations between sample characteristics (e.g., geographical settings, location, and gender distribution) and procedural and methodological factors (e.g., prevalence period, response rates, methods of data collection, sample size, sampling procedure) and the prevalence estimates of prevalence of elder abuse.

Secondary Outcomes

Where available, secondary outcomes for this review will include prevalence estimates for sub-groups such as racial/ethnic minorities and abuse by type of perpetrator (e.g., adult children, spouses).

Risk of Bias in Individual Studies

An assessment of risk of bias will be incorporated into our analysis. By assessing the quality of the studies that will be included in the meta-analysis, we can assess the strength of the body of evidence on prevalence estimates. In particular, information relating to bias will be extracted from each study during the data extraction process. This assessment will follow the same procedure with the data collection process where disagreements will be resolved by discussion between the reviewers or with a third reviewer. To facilitate the appraisal of possible risk of bias, we will use the *risk of bias tool* developed by Hoy, Brooks, and Woolf (2012). This tool was developed specifically to assess the risk of bias for population-based prevalence studies.

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The tool will assess the study methodological quality in terms of both external and internal validity by examining the following factors.

External Validity

The risk of bias tool will assess external validity by checking that the

- target population is a close representation of the intended population;
- sampling frame is a true or close representation of the target population;
- sample is selected through some form of random selection (e.g., simple random sampling, stratified random sampling, cluster sampling, and systematic sampling); and
- non-response bias is addressed.

Internal Validity

The risk of bias tool will assess internal validity by checking that the

- data are collected from subjects or via proxy;
- operational definitions are clearly defined (i.e., how abuse is measured);
- instrument(s) that measured the parameter of interest shown to have reliability and validity;
- data collection methodology is consistently applied to all subjects;
- length of the shortest prevalence period is appropriate; and
- numerator(s) and denominator(s) are appropriate.

Furthermore, to evaluate the risk of bias, reviewers will assess and rate each of the above 10 items into two dichotomous ratings: low or high risk. The procedures undertaken to assess each item for each study are described in the glossaries. Each item will be rated as "low risk" or "high risk" of bias. The tool will rate low risk if information is not available or unclear in the individual studies. In particular, "low risk" indicates that further research is very unlikely to change the confidence of the estimates whereas "high risk" indicates that further research is very likely to change the estimate.

Given the expected wide variations in methodology of elder abuse studies, we will not consider each item in the risk of bias assessment independently but will assign an overall score to provide the overall strength of evidence. The overall score is calculated by adding all the items rated as "low risk"; thus, higher scores will indicate lower risk of bias and stronger methodological quality.

Data Synthesis

To address the main review questions, data will be synthesized in two phases. Phase 1 will answer the first question, What are the prevalence estimates for elder abuse and its sub-types in both community and institutional populations and at three levels: globally, regionally (WHO regions), and nationally? In this phase, we will provide a descriptive overview and analysis of the characteristics of the selected studies. The selected studies will be further classified in meaningful ways in order to avoid biased results due to the grouping of vastly different studies (i.e., different prevalence periods – e.g., past year, past month, lifetime, etc.) with different population groups (e.g., studies involving older adults with mental capacity issues such as dementia). To obtain the pooled prevalence estimates, we will use raw proportions of abuse rates from each study. Furthermore, the proportion of abused older adults will be transformed into a logit event rate effect size with a corresponding standard error (Lipsey & Wilson, 2001). The pooled estimates will be calculated using DerSimonian and Laird's (1986) method for random-, rather than fixed-, effects models, given it is likely that the true effect – or prevalence rate in this case – varies from study to study (Borenstein, et al., 2009). The meta-analyses in this protocol will be performed using the Comprehensive Meta-Analysis (CMA 3.9) program (Borenstein, Rothstein, & Cohen, 2005).

In this review, we will calculate the pooled estimates and the 95 per cent confidence intervals (CIs) among studies sharing similar characteristics, which will be structured around the target population, age groups, gender, prevalence period, community versus institutional settings, quality of studies, and others. Where possible, we will break down prevalence estimates by gender and will consider non-overlapping CIs as indication of statistically significant differences. Although the strength of meta-analysis lies in the number of studies included in the analysis, a study that examines the characteristics of meta-analyses across disciplines found that the median number of studies included in meta-analysis is three (Davey, Turner, Clarke, & Higgins, 2011).

To determine the extent of variation between the selected studies, tests of heterogeneity will be performed. The Q-statistic provides a test of the null hypothesis that all studies share a common effect size (Borenstein, et al., 2009). Moreover, to measure the proportion of the observed variance that reflects true effect sizes rather than sampling error, we will use Higgins (I^2) statistic, reported as a percentage (Higgins, Thompson, Deeks, & Altman, 2003). The I^2 statistics will tell us what proportion of variance would remain if sampling error were removed. Higgins and colleagues (2003) provided tentative benchmarks for I^2 where values below 25 per cent might be considered as low, 50–75 per cent as moderate, and above 75 per cent as high. Moreover, since I^2 does not provide absolute dispersion of variance, we will estimate T^2 to measure the actual dispersion of variance using the observed effects.

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In phase 2, we will address the second review question – What are the characteristics of the populations and methods that are associated with prevalence rates in the community settings? – by conducting meta-regression analyses to investigate the influence of sample characteristics as well as methodological and procedural characteristics on the prevalence estimates of elder abuse and neglect.

These characteristics (i.e., moderators) might include gender distribution, methods of data collection, sample size, research quality, and sampling procedure. We will select random-effects models and assign weights to each study as well as calculating R^2 to quantify the proportion of variance explained by the moderators. As is true for regression analyses for primary studies, meta-regression analyses need a large ratio of studies to co-variates. It is generally recommended to have a ratio of at least 10 for each co-variate/moderator (Borenstein et al., 2009). For this protocol, a *p*-value of less than .05 will be considered significant for moderators that predicted prevalence estimates.

Meta-bias(es)

In addition to the academic database searches and to reduce the risk for publication bias, we will incorporate non-peer reviewed studies (i.e., grey literature, government, and technical reports), and we will also broaden the literature search using Google and experts' consultations. To assess evidence of publication bias, visual inspection of the funnel plots will be conducted followed by Duval and Tweedie's *trim and fill* method to assess the degree of bias and its impact on the findings (Duval & Tweedie, 2000a, 2000b). The funnel plot will be plotted with effect size on the *x*-axis and the sample size on the *y*-axis. An asymmetric distribution of studies around the mean effect size will provide the first indication of the presence of publication bias (Borenstein, et al., 2009; Light & Pillemer, 1984).

To determine whether the observed effect is attributed to bias, we will use the trim and fill method to remove extreme outliers (i.e., small studies) from the funnel plot and re-compute the effect size until the funnel plot is symmetric, thereby correcting the bias (Duval & Tweedie, 2000a, 2000b). This approach is advantageous because computer programs that incorporate the trim and fill method to adjust for bias are able to create funnel plots that include both original and the imputed studies, thereby allowing researchers to compare and contrast whether the observed effect is attributed to publication bias (Borenstein, et al., 2009).

Ethics and Dissemination Plans

This current systematic review will analyse data from existing published and unpublished studies. Since these studies are available in the public domain, ethics approval is not a requirement. The results from this protocol will be published in peer-reviewed journals and as a doctoral dissertation at the Leonard Davis School of Gerontology, University of Southern California. Findings will also be presented at conferences and shared with relevant aging centres and institutes. We further plan to update the review over time as appropriate.

Supplementary Material

To view supplementary material for this article, please visit https://doi.org/10.1017/S0714980817000137

References

Abdel Rahman, T. T., & El Gaafary, M. M. (2012). Elder mistreatment in a rural area in Egypt. *Geriatrics & Gerontology International*, *12*, 532–537.

Ajdukovic, M., Ogresta, J., & Rusac, S. (2009). Family violence and health among elderly in Croatia. *Journal of Aggression, Maltreatment & Trauma*, *18*, 261–279.

Baker, M. (2007). Elder mistreatment: Risk, vulnerability, and early mortality. *Journal of American Psychiatric Nurses Association*, *12*(6), 313–321.

Baker, M., LaCroix, A. Z., Wu, C., Cochrane, B. B., Wallace, R., & Woods, N. (2009). Mortality risk associated with physical and verbal abuse in women aged 50–79. *Journal of the American Geriatrics Society*, *57*(10), 1799–809.

Borenstein, M., Hedges, L. V., Higgins, J. P. T., & Rothstein, H. R. (2009). *Introduction to meta-analysis*. West Sussex, ENG: John Wiley & Sons.

Borenstein, M., Rothstein, D., & Cohen, J. (2005). *Comprehensive meta-analysis: A computer program for research synthesis* [Computer software]. Englewood, NJ: Biostat.

Burnes, D., Pillemer, K., Caccamise, P.L., Mason, A., Henderson, C.R., Berman, J., … Lachs, M. S. (2015). Prevalence of and risk factors for elder abuse and neglect in the community: A population-based study. *Journal of the American Geriatric Society (JAGS)*, *63*, 1906–1912.

Centers for Disease Control. (2015). Elder abuse: Definitions. Retrieved from: http://www.cdc.gov/violenceprevention/elderabuse/definitions.html

Chokkanathan, S., & Lee, A. E. (2005). Elder mistreatment in urban India: a community based study. *Journal of Elder Abuse & Neglect*, *17*(2), 45–61.

Cooper, C., Selwood, A., & Livingston, G. (2008). The prevalence of elder abuse and neglect: A systematic review. *Age Ageing*, *37*(2), 151–160.

Comijs, H., Penninx, B., Knipscheer, K., & van Tilburg, W. (1999). Psychological distress in victims of elder mistreatment: The effects of social support and coping. *Journal of Gerontology: Psychological Sciences*, *54*(4), P240–P245.

https://doi.org/10.1017/S0714980817000137 Published online by Cambridge University Press

Davey, J., Turner, R. M., Clarke, M. J., & Higgins, J. P. T. (2011). Characteristics of meta-analyses and their component studies in the Cochrane Database of Systematic Reviews: A cross-sectional, descriptive analysis. *BMC Medical Research Methodology*, *11*, 160–171.

DerSimonian, R., & Laird, N. (1986). Meta-analysis in clinical trials. *Control Clinical Trials 7*, 177–188.

Dong, X. (2015). Elder abuse: Systematic review and implications for practice. *Journal of the American Geriatrics Society*, *63*, 1214–1238.

Dong, X., & Simon, M. A. (2013). Elder abuse as a risk factor for hospitalization in older persons. *JAMA [Journal of the American Medical Association] Internal Medicine*, *173*(10), 153–162.

Dong, X., Simon, M., Beck, T., & Evans, D. (2013). Decline in cognitive function and elder mistreatment: Findings from the Chicago health and aging project. *American Journal of Geriatric Psychiatry*, *22*(6), 598–605.

Dong, X., Simon, M., de Leon, C. M., Fulmer, T., Beck, T., Hebert, L., … Evans, D. (2009). Elder self-neglect and abuse and mortality risk in a community-dwelling population. *Journal of the American Medication Association*, *302*(5), 517–526.

Duval, S., & Tweedie, R. (2000a). A nonparametric 'trim and fill' method of accounting for publication bias in meta-analysis. *Journal of the American Statistical Association*, *95*, 89–98.

Duval, S., & Tweedie, R. (2000b). Trim and fill: A simple funnel-plot-based method of testing and adjusting for publication bias in meta-analysis. *Biometrics*, *56*, 455–463.

Goldman, J. D. G., & Padayachi, U. K. (2000). Some methodological problems in estimating incidence and prevalence in child sexual abuse research. *Journal of Sex Research*, *37*, 305–314.

Government of Canada. (2015). Elder abuse: It's time to face the reality. Retrieved from: https://www.canada.ca/en/employment-social-development/campaigns/elder-abuse/reality.html

Higgins, J., Thompson, S. G., Deeks, J. J., & Altman, D. G. (2003). Measuring inconsistency in meta-analyses. *British Medical Journal*, *327*, 557–560.

Hoy, D., Brooks, P., & Woolf, A. (2012) Assessing risk of bias in prevalence studies: modification of an existing tool and evidence of interrater agreement. *Journal of Clinical Epidemiology*, *65*(9), 934–939.

Hughes, K., Bellis, M. A., Jones, L., Wood, S., Bates, G., Eckley, L., … Officer, A. (2012). Prevalence and risk of violence against adults with disabilities: A systematic review and meta-analysis of observational studies. *Lancet*, *379*, 1621–1629.

Jones, L., Bellis, M. A., Wood, S., Hughes, K., McCoy, E., Eckley, L..,.. Officer, A. (2012). Prevalence and risk of violence against children with disabilities: A systematic review and meta-analysis of observational studies. *The Lancet*, *380*(9845), 899–907.

Lachs, M. S., & Pillemer, K. (2004). Elder abuse. *The Lancet*, *364*(9441), 1263–1272.

Lachs, M. S., William, C. S., O'Brien, S, & Pillemer, K. A. (1998). The mortality of elder mistreatment. *Journal of the American Medication Association*, *280*(5), 428–432.

Light, R. J., & Pillemer, D. B. (1984). Summing up: The science of reviewing research. Cambridge, MA: Harvard University Press.

Lipsey, M. W., & Wilson, D. B. (2001). *Practical meta-analysis*. Thousand Oaks, CA: Sage.

Lowenstein, A., Eisikovits, Z., Band-Winterstein, T. & Enosh, G. (2009). Is elder abuse and neglect a social phenomenon? Data from the First National Prevalence Survey in Israel. *Journal of Elder Abuse & Neglect*, *21*(3), 253–277.

McDonald, L., Beaulieu, M., Harbison, J., Hirst, S., Lowenstein, A., Podnieks, E., & Wahl, J. (2012). Institutional abuse of older adults: What we know, what we need to know. *Journal of Elder Abuse & Neglect*, *24*(2), 138–160.

Mikton, C., Tanaka, M., Tomlinson, M., Streiner, D. L., Tonmyr, L., Lee, B., …, & MacMillan, H. L. (in press). Research priorities for violence prevention: A global modified Delphi study. Manuscript accepted for publication.

Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., & The PRISMA Group. (2009). Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement. *PLoS Med*, *6*(7), e1000097.

Mouton, C. P., & Espino, D. V. (1999). Health screening in older women. *American Family Physician*, *59*, 1835–1842.

Ogioni, L., Liperoti, R., Landi, F., Soldato, M., Bernabei, R., & Onder, G. (2007). Cross-sectional association between behavioral symptoms and potential elder abuse among subjects in home care in Italy: Results from the Silvernet Study. *American Journal of Geriatric Psychiatry*, *15*(1), 70–78.

Oh, J., Kim, H. S., Martins, D., & Kim, H. (2006). A study of elder abuse in Korea. *International Journal of Nursing Studies*, *43*(2), 203–214.

O'Keeffe, M., Hills, A., Doyle, M., McCreadie, C., Scholes, S., Constantine, R., … Erens, B. (2007). *UK study of abuse and neglect of older people: Prevalence survey report*. London: Department of health. Retrieved from http://www.natcen.ac.uk/media/308684/p2512-uk-elder-abuse-final-for-circulation.pdf

Pillemer, K., Connolly, M.T., Breckman, R., Spreng, R. N., & Lachs, M. S. (2015). Elder mistreatment: Priorities for consideration by the White House Conference on Aging. *The Gerontologist*, *55*(2), 320–327.

Podnieks, E., Pillemer, K., Nicholson, J., Shillington, T., & Frizzel, A. (1990). *National survey on abuse of the elderly in Canada: Final report*. Toronto, ON: Ryerson Polytechnical Institute.

https://doi.org/10.1017/S0714980817000137 Published online by Cambridge University Press

Ramsey-Klawsnik, H., Teaster, P. B., Mendiondo, M. S., Marcum, J. L., & Abner, E. L. (2008). Sexual predators who target elders: Findings from the first national study of sexual abuse in care facilities. *Journal of Elder Abuse & Neglect*, *20*(4), 353–376.

Schofield, M. J., Powers, J. R., & Loxton, D. (2013). Mortality and disability outcomes of self-reported elder abuse: A 12-year prospective investigation. *Journal of the American Geriatrics Society*, *61*(5), 679–685. doi:10.1111/jgs.12212

Shamseer, L., Moher, D., Clarke, M., Ghersi, D., Liberati, A., Petticrew, M., … PRISMA-P Group. (2015). Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015: Elaboration and explanation. *BMJ 349*, g7647.

Stahl, S. M. (2015). *Building consensus on research priorities in elder mistreatment*. Washington, DC: United States Department of Justice. Retrieved from http://www.justice.gov/elderjustice/research/resources/Building_Consensus_On_Research_Priorities_In_Elder_Mistreatment.pdf

Stoltenborgh, M., Bakermans-Kranenburg, M. J., Alink, L. R. A., & Van IJzendoorn, M. H. (2012). The universality of childhood emotional abuse: A meta-analysis of worldwide prevalence. *Journal of Aggression, Maltreatment & Trauma*, *21*, 870–890.

Stoltenborgh, M., Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (2013). The neglect of child neglect: A meta-analytic review of the prevalence of neglect. *Social Psychiatry Psychiatric Epidemiology*, *48*, 345–355.

Stoltenborgh, M., Van IJzendoorn, M. H., Euser, E. M., & Bakermans-Kranenburg, M. J. (2011). A global perspective on child sexual abuse: Meta-analysis of prevalence around the world. *Child Maltreatment*, *16*(2), 79–101.

U.S. Department of Justice and Department of Health and Human Services. (2014). *The elder justice roadmap: A stakeholder initiative to respond to an emerging health, justice, financial and social crisis*. Washington, DC: Author. Retrieved from the U.S. Department of Justice website: https://www.justice.gov/file/852856/download

Walsh, C. A., & Yon, Y. (2012). Developing an empirical profile for elder abuse research in Canada. *Journal of Elder Abuse and Neglect*, *24*(2), 104–119.

Weeks, L. E., & LeBlanc, K. (2011). An ecological synthesis of research on older women's experiences of intimate partner violence. *Journal of Women & Aging*, *23*(4), 283–230.

World Health Organization. (2002). *Missing voices: Views of older persons on elder abuse*. Geneva, CHE: Author. Retrieved from www.who.int/ageing/projects/elder_abuse/missing_voices/en/

World Health Organization. (2014). *Global status report on violence prevention 2014*. Geneva, CHE: World Health Organization, United Nations Office on Drugs and Crime, & United Nations Development Programme. Retrieved from http://www.who.int/violence_injury_prevention/violence/status_report/2014/en/

World Health Organization. (2015). Proposed working definition of an older person in Africa for the MDS Project. Geneva, CHE: World Health Organization. Retrieved from http://www.who.int/healthinfo/survey/ageingdefnolder/en/

World Health Organization. (2016). Elder abuse. Geneva, CHE: Author. Retrieved from http://www.who.int/mediacentre/factsheets/fs357/en/

Wu, L., Chen, H., Hu, Y., Xiang, H., Yu, X., Zhang, T., … Wang, Y. (2012). *Prevalence and associated factors of elder mistreatment in a rural community in People's Republic of China: A cross-sectional study*. *PloS one*, *7*(3), e33857. Retrieved from https://doi.org/10.1371/journal.pone.0033857

https://doi.org/10.1017/S0714980817000137 Published online by Cambridge University Press