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Updated systematic review and meta-analysis of studies examining the relationship between reported racism and health and well-being for children and youth: a protocol

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ABSTRACT

Introduction Racism is a critical determinant of health and health inequities for children and youth. This protocol aims to update the first systematic review conducted by Priest et al (2013), including a meta-analysis of findings. Based on previous empirical data, it is anticipated that child and youth health will be negatively impacted by racism. Findings from this review will provide updated evidence of effect sizes across outcomes and identify moderators and mediators of relationships between racism and health.

Methods and analysis This systematic review and meta-analysis will include studies that examine associations between experiences of racism and racial discrimination with health outcomes of children and youth aged 0–24 years. Exposure measures include self-reported or proxy reported systemic, interpersonal and intrapersonal racism. Outcome measures include general health and well-being, physical health, mental health, biological markers, healthcare utilisation and health behaviours. A comprehensive search of studies from the earliest time available to October 2020 will be conducted. A random effects meta-analysis will examine the average effect of racism on a range of health outcomes. Study-level moderation will test the difference in effect sizes with regard to various sample and exposure characteristics. This review has been registered with the International Prospective Register of Systematic Reviews.

Ethics and dissemination This review will provide evidence for future research within the field and help to support policy and practice development. Results will be widely disseminated to both academic and non-academic audiences through peer-review publications, community summaries and presentations to research, policy, practice and community audiences.

PROSPERO registration number CRD42020184055.

Strengths and limitations of this study

► This protocol aims to update the international review of racism and child health conducted by Priest et al (2013).

► The updated protocol now extends to include study participants aged 0–24 years to recognise the importance of youth development.

► This protocol includes a broad search strategy that aims to capture varied exposure measures of racism and racial discrimination as well as health and well-being outcomes.

► This protocol describes a meta-analysis to be conducted exploring relationships between racism and health among children and youth.

► This systematic review has a bias towards papers published in English, meaning that studies not published in English will not be included in this review.

INTRODUCTION

Racism and racial discrimination are widely recognised as critical determinants of health and health inequities for children and youth across populations and contexts.[1–3] Racism is a system of oppression that categorises and stratifies social groups into 'races', devalues and disadvantages those considered inferior and differentially allocates to them valued societal resources and opportunities.[4 5] Racism is expressed across multiple levels, including systemic or structural racism, embedded within society; interpersonal racism between two or more individuals and includes racially motivated assaults or abuse and intrapersonal racism, whereby people take on negative stereotypes and beliefs about themselves.[6–8] Racism and racial discrimination operates in many forms including direct and vicarious racism (secondhand racism), whereby individuals experience racism on a secondary level, witnessing or being informed of family, friends and strangers experiencing racism.[9 10] Racism profoundly and perniciously impacts indigenous and racialised

peoples throughout the world, including children and youth, for whom racism and racial discrimination is a major burden and influence on their health and development throughout life.[1 2 11]

Research on racism and health has predominantly focused on interpersonal experiences, with considerable evidence documenting negative health effects across multiple outcomes, including physical and mental health outcomes.[5 12 13] However, most of this evidence focused on adults, with far less research conducted among children and youth.

Priest *et al*[1] conducted the first international systematic review of quantitative studies on reported racial discrimination and the health and well-being of children and youth, including 121 studies. Since this report was published in 2013, the contribution of racism as a social determinant of health and well-being among children and youth has received growing attention.[3] There is increasing evidence of the impact of racism on pathophysiological processes (eg, allostatic load and stress neurobiology) and biological markers (eg, C reactive protein and cortisol)[14] as well as on health behaviours such as sleep[15–17] among children and youth. The American Academy of Pediatrics recently issued a policy statement highlighting the impact that racism has on young people's health and health inequities and that addressing racism needs to be an urgent priority.[2]

A recent review of vicarious racism and child health found 30 studies published up to May 2016 compared with 10 studies in the previous 2013 review (with studies searched up to November 2011).[9] This represents a threefold increase in studies examining vicarious racism and child health in approximately 4½ years. Additionally, our original review found that two-thirds of the included studies were published between 2005 and 2012.[1] In light of the growing research in the field, there is a need to review and reflect on the current evidence to inform future scholarship in this area.

This present systematic review and meta-analysis aims to update findings from the 2013 review conducted by Priest *et al*.[1] An updated systematic review is necessary to include new data, new methods and updated analysis.[18] In this instance, an updated systematic review is necessary due to changing social policy and demographic contexts and new health priorities globally, as well as an increase in the number of recent publications in this area, including in different country and population contexts. The first systematic review identified that there were a limited number of longitudinal studies that have explored the health effects of racism on children and a need to expand research in this area, with a focus needed on the complex pathways to which child and youth health is impacted by experiences of racial discrimination.[1] Priest *et al* called for an increase in high-quality longitudinal research using robust multidimensional measures of racial discrimination.[1] As highlighted since this review was published in 2013, there has been a large increase in the amount of research being conducted in this field.

To answer our research question 'to what extent are experiences of racism associated with health and well-being outcomes among children and youth compared with those who experience no or less racism', we will use the previous review (Priest *et al*[1]) as a guide, building on it and using an updated inclusion and exclusion strategy as well as expanding it to include a meta-analysis. As indicated by Garner *et al*,[18] an updated systematic review can have an updated inclusion criteria while answering a similar question. This systematic review and meta-analysis aims to quantify the effects of racial discrimination on child and youth health, examine the key pathways by which racial discrimination influences these outcomes and identify potential moderators and mediators between racism and health. This review will provide key recommendations for future research and inform the development of effective evidence-based strategies for addressing racism and ameliorating its harmful effects.

METHODS AND ANALYSIS

This systematic review and meta-analysis will follow the guidelines of the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA)[19] with the PRISMA Protocols[20] checklist followed for the writing of this protocol (see online supplemental file 1). Progress on this systematic review and meta-analysis will be updated on the International Prospective Register of Systematic Reviews to maintain transparency.

Inclusion criteria

This report will include primary empirical studies that use quantitative methods including but not limited to cross-sectional; prospective and retrospective cohort; case–control designs; quasi-experimental studies and randomised control trials. Peer-reviewed journal articles (published or available as preprints) and dissertations/theses will be included. We will also include grey literature such as published reports. Studies that do not report primary empirical associations between racism and child and youth health will not be included. Editorials and commentaries will not be included unless they report primary empirical data. According to the Population, Intervention, Comparison and Outcomes tool outlined in the Cochrane Handbook,[21] we defined our population, intervention (exposure of interest) and specific outcome measures.

Population

Participants will include children and youth aged up to 24 years from any racial/ethnic/cultural groups. The age range of participants has been updated since the previous review (which included participants up to 18 years) to include children and youth as per the United Nations definition.[22–24] This broader age range will allow for consideration of the health impacts of racism into late adolescence which is now considered by the Lancet

Commission on Adolescent Health as extending to 24 years.[24]

Exposure

This review will extract childhood experiences of racism and racial discrimination exposures, synthesised across three main categories in the meta-analysis: systemic racism; interpersonal experiences including direct and vicarious or secondhand experiences (eg, witnessing or hearing about racism experienced by family, friends or a group an individual belongs to) and intrapersonal racism (eg, adapting racist attitudes and/or beliefs within their world views). Both personal and proxy reports (by parents or caregivers) of experiences of racism will be recorded, as will the source of racism (categorised as peers, teachers and community).

Terms used to determine the exposure include but are not limited to racism, discrimination, prejudice, harassment, bullying, stereotypes and unfair treatment where reason includes the victims' race/ethnicity/cultural background or proxy indicators such as migrant background, skin colour, language or accent. Although we recognise that religion is often highly racialised,[25] studies of religious discrimination will not be included as we consider this a related, but distinct form of discrimination. Religious discrimination is distinguished by being an assault on an individual or group's belief system and warrants independent investigation.[26]

There will be no restrictions placed on the timeframe of exposure to racism prior to the measurement. Retrospective adult population studies that report on childhood experiences of racism will be noted, but will not be included in our analysis.

Outcome measures

Studies will be considered if they measure health outcomes in children and youth. Health and well-being outcomes include measures of ill health and illness as well as positive health outcomes across physical, mental and behavioural domains. As guided by previous reviews and research,[1 12 15 27–32] the following health and well-being outcomes will be included:

1. Pregnancy and birth outcomes (eg, premature birth, low birth weight).
2. General health and well-being, life satisfaction and quality of life.
3. Physical health (infectious disease and chronic conditions and markers, for example, body mass index, waist–hip ratio, blood pressure, metabolic and cardiovascular disease, overweight, obesity).
4. Negative mental health (eg, social and emotional difficulties, psychological distress, mental illness, suicide risk, self-harm, psychosis, antisocial behaviours including aggression and violence).
5. Positive mental health (eg, self-esteem, self-worth and resilience).
6. Health behaviours (eg, alcohol, tobacco, substance use) and sleep.

7. Healthcare utilisation, healthcare costs, satisfaction with child healthcare system (use of screening tests, maternal child healthcare, access to healthcare and treatment, adherence to treatment).
8. Biological markers (eg, inflammation and cardiometabolic markers).

Exclusion criteria

Studies reporting the effects of reported racism on other outcomes (eg, cognitive development, education, employment) will not be included. Studies that do not attribute discrimination experiences to race or ethnicity but only report generalised discrimination or unfair treatment without attribution will not be included. Studies published in a language other than English will not be included. Qualitative studies or studies only reporting the prevalence of racism without identifying associations with health and well-being outcomes will not be included.

Data extraction and management
Search strategy

The search strategy will be conducted in English and include studies from the earliest time available to October 2020. The search strategy will not be restricted to papers only published since the completion of the previous search strategy in 2011 as databases regularly back index studies and therefore some studies may have been missed by the original review.[1] The search will be checked against the original search results to ensure that all studies that have been back indexed are also included.

The search will be conducted in the Ovid Medline, Ovid PsycInfo, PubMed, ERIC and ProQuest (for dissertation/theses) databases. Reference lists of included studies will also be hand searched for additional relevant studies. The authors will also search Google Scholar to identify papers and reports citing the previous review and will search grey literature databases including Open Grey, OpenDOAR and New York Academy of Medicine using keywords from the search strategy.

The search will be performed using a string template combining search terms relevant to our study population, exposure and outcomes. The search strategy template has been developed in consultation with medical library staff using the previous search strategy by Priest *et al*[1] as a template. The search template to be used for Medline is included as online supplemental file 2, which will be updated accordingly for each database.

Selection of studies

One member of the review team will conduct the initial search in the selected databases with the search results to be imported into Endnote X9.[33] All titles and abstracts of studies identified in the search will be independently screened for eligibility for inclusion independently by two members of the review team using Covidence[34] with any discrepancies resolved by the lead author. Duplicates and papers not in English will be deleted and noted in the PRISMA flowchart.[19] Full-text studies will be assessed for

final inclusion. Any discrepancies between members of the review team will be resolved by having a third member of the review team adjudicate the decision. Rationale for exclusion of studies will be noted throughout the screening process with a PRISMA flowchart[19] being used to show the full selection process of studies.

Data extraction

Once the full-text studies have been identified, members of the review team will extract the data using Airtable.[35] Two reviewers will independently extract data from each study, with inconsistencies and discrepancies resolved through discussion. Data from some studies may appear in multiple publications. If publications include unique combinations of exposure and outcome variables, they will be extracted as distinct data sets, meaning that one study may be included in the meta-analysis multiple times as different datasets due to its use of multiple measures of health or racism.

This review will examine the key characteristics of studies of reported racism and health and well-being among children and youth. Data to be extracted will include: authors; year of publication; study design (including sampling methods); definition of racism, exposure measure(s) (including tools/instruments and psychometric properties when applicable, method of administration including informant(s), content and time frames of exposure, targets and perpetrators, reactions/responses to racism and settings in which racism is experienced); health and well-being outcome measures; measures of racial/cultural/ethnic background; study location (country/region); place of residence (urban/rural), sample size; participant demographics (age, racial/cultural backgrounds, gender, socioeconomic status, migration status); study findings; prevalence of self-reported racism including exposure characteristics; nature of associations between self-reported racism and health and well-being outcomes including subgroup analysis when reported (mean, SD, effect size); confounders, effect moderator and mediators of these associations and study quality/critical appraisal.

Effect sizes such as coefficients and p values for each health outcome will be extracted. Both unadjusted and adjusted effect sizes will be extracted when available and covariates included in models recorded. Where an overall effect size is reported across a range of age groups, we will extract subgroup effect sizes when reported. In this case, only effect sizes for children and youth will be extracted.

Data including study characteristics, participant characteristics and exposure and outcome characteristics will be extracted to be included in the narrative synthesis but will not be included in the meta-analysis.

Assessment of study quality and bias

Studies included in the review will be critically appraised to determine the validity of the study's findings from the known literature and to provide readers with the ability to make an informed decision on the quality of these findings. Two members of the review team will independently rate studies selected for the meta-analysis using the Newcastle-Ottawa Scale, a widely used tool for evaluating the quality of non-randomised studies on a range of criteria.[36] The Newcastle-Ottawa Scale (online supplemental file 3) was determined to be the most appropriate instrument for quality assessment via a consideration of tools available in the Systematic Review Toolbox.[37] Any discrepancies between quality ratings will be resolved through discussion with the lead author. The quality ratings for each study will be provided in a table in the online supplemental material and studies with scores deemed less than satisfactory will be discussed as part of the narrative analysis. We will not exclude any articles from analysis due to low-quality scores, but sensitivity analysis will be performed to determine any effect of including studies that score less than 'good' according to Agency for Health Research and Quality standards.[38]

Evidence of publication bias and small-study effects will be assessed using two methods (available in the Stata meta suite).[39] First, we will examine contour-enhanced funnel plots for asymmetry using the Egger regression test.[40] Second, we will use trim-and-fill analysis to estimate effects sizes that are adjusted for publication bias.[41]

Analysis

Data that meet all inclusion criteria will first be summarised descriptively and then analysed statistically. Data analysis will be conducted using Airtable and Stata V.16.[35 39]

Following the format of the original review and drawing on the synthesis without meta-analysis (SWiM)[42] reporting items, a narrative synthesis of study characteristics and findings will be conducted. This will provide a description and rationale for the reporting of groups used in the synthesis such as study populations, outcomes, study designs, methods used to assess the certainty of the evidence and limitations of the review. Study characteristics will be presented in summary tables across key variables (including study design, year, setting, country; population characteristics; exposure measures including number of items and whether validated; definition of racism used). If meta-analysis is not possible, the nature of the relationship between exposure and outcome (positive, negative or null) across key study characteristics will be summarised, following the approach in the original review.[1]

Although meta-analysis is planned, this will only become apparent when extracted data are reviewed for feasibility. If data are available, we will conduct analyses of associations between racism and health for different health outcome measures and at different time points. If possible, we will use random effects models to aggregate effect sizes. Subgroup analyses will be conducted for age, gender and ethnicity if possible. To assess the heterogeneity of studies, we will use the Q-statistic test and the I^2 statistic. If the test for heterogeneity denoted as I^2 (if $I^2 \leq 25\%$), studies will be considered homogeneous. Based on the Grading of Recommendations, Assessment,

Development and Evaluation framework,[43] we will rate the quality of the overall evidence across each outcome to conclude.

Patient and public involvement
No patient involvement.

DISCUSSION
As this is an updated systematic review and meta-analysis, we expect that while there has been a significant amount of recent research conducted in this space, we do not anticipate our findings to be vastly different from our original review. This review and meta-analysis will incorporate studies with participants from all ethnic/racial/cultural backgrounds and studies will not be limited to any one country or geographic area, and in doing so, we anticipate to show that this is a problem faced by not just one specific population but by children globally. That is, we expect the review to show that racism and racial discrimination negatively impact multiple health outcomes in children and youth from different ethnic/racial/cultural backgrounds and across contexts. We expect an increase of research in outcomes not considered in the original review, including sleep and inflammatory and immune biomarkers, as well as markers of epigenetic risk and cellular ageing and of endocrine and hormonal function. Increased attention on younger age groups, vicarious as well as direct exposure, longitudinal associations and populations and settings outside of the USA are also anticipated.

Due to the expectant increase in research surrounding this topic, a key contribution of the current study is to conduct a meta-analysis, which was not able to be conducted before. We expect that through this meta-analysis, we will be able to show rigorous and robust evidence showing the relationship between experiences of racism and health and well-being outcomes for children and youth. As this is the first meta-analysis of these studies, it will provide an evidence base for future research exploring the effect of racism and child health, as well as for policy development and service delivery.

Review findings will provide essential information for future research and policy priorities and inform the development effective evidenced-based targets for interventions to ameliorate the harmful impacts of racism on child and youth health.

ETHICS AND DISSEMINATION
Ethics approval is not required as this is a review of existing empirical findings and no primary data will be collected throughout the research.

The results from this review will be disseminated in peer-review publications and conference presentations as well as communicated more broadly through factsheets and summaries disseminated through academic institution press release and policy and practice partners.

Specific dissemination strategies will be codesigned with policy, practice and community stakeholders towards completion of the review.

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Supplemental material

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Supplementary File 1- PRISMA-P (Preferred Reporting Items for Systematic review and Meta-Analysis Protocols) 2015 checklist: recommended items to address in a systematic review protocol*

Section and topic	Checklist item	Page number
ADMINISTRATIVE INFORMATION		
Title:		
Identification	1a. Identify the report as a protocol of a systematic review	Title page
Update	1b. If the protocol is for an update of a previous systematic review, identify as such	Title page
Registration	2. If registered, provide the name of the registry (such as PROSPERO) and registration number	PROSPERO (CRD42020184055)
Authors:		
Contact	3a. Provide name, institutional affiliation, e-mail address of all protocol authors; provide physical mailing address of corresponding author	Title page
Contributions	3b. Describe contributions of protocol authors and identify the guarantor of the review	11
Amendments	4. If the protocol represents an amendment of a previously completed or published protocol, identify as such and list changes; otherwise, state plan for documenting important protocol amendments	Not applicable
Support:		
Sources	5a. Indicate sources of financial or other support for the review	11
Sponsor	5b. Provide name for the review funder and/or sponsor	11
Role of sponsor or funder	5c. Describe roles of funder(s), sponsor(s), and/or institution(s), if any, in developing the protocol	11
INTRODUCTION		
Rationale	6. Describe the rationale for the review in the context of what is already known	2-3
Objectives	7. Provide an explicit statement of the question(s) the review will address with reference to participants, interventions, comparators, and outcomes (PICO)	4
METHODS		
Eligibility criteria	8. Specify the study characteristics (such as PICO, study design, setting, time frame) and report characteristics (such as years considered, language, publication status) to be used as criteria for eligibility for the review	4-5
Information sources	9. Describe all intended information sources (such as electronic databases, contact with study authors, trial registers or other grey literature sources) with planned dates of coverage	6
Search strategy	10. Present draft of search strategy to be used for at least one electronic database, including planned limits, such that it could be repeated	6; Supplementary file 2
Study records:		
Data management	11a. Describe the mechanism(s) that will be used to manage records and data throughout the review	6-7

Supplemental material

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Selection process	11b. State the process that will be used for selecting studies (such as two independent reviewers) through each phase of the review (that is, screening, eligibility and inclusion in meta-analysis)	6-7
Data collection process	11c. Describe planned method of extracting data from reports (such as piloting forms, done independently, in duplicate), any processes for obtaining and confirming data from investigators	7
Data items	12. List and define all variables for which data will be sought (such as PICO items, funding sources), any pre-planned data assumptions and simplifications	7
Outcomes and prioritization	13. List and define all outcomes for which data will be sought, including prioritization of main and additional outcomes, with rationale	7
Risk of bias in individual studies	14. Describe anticipated methods for assessing risk of bias of individual studies, including whether this will be done at the outcome or study level, or both; state how this information will be used in data synthesis	8
Data synthesis	15a. Describe criteria under which study data will be quantitatively synthesised	8
	15b. If data are appropriate for quantitative synthesis, describe planned summary measures, methods of handling data and methods of combining data from studies, including any planned exploration of consistency (such as I^2, Kendall's τ)	8
	15c. Describe any proposed additional analyses (such as sensitivity or subgroup analyses, meta-regression)	8
	15d. If quantitative synthesis is not appropriate, describe the type of summary planned	8
Meta-bias(es)	16. Specify any planned assessment of meta-bias(es) (such as publication bias across studies, selective reporting within studies)	8
Confidence in cumulative evidence	17. Describe how the strength of the body of evidence will be assessed (such as GRADE)	10

* It is strongly recommended that this checklist be read in conjunction with the PRISMA-P Explanation and Elaboration (cite when available) for important clarification on the items. Amendments to a review protocol should be tracked and dated. The copyright for PRISMA-P (including checklist) is held by the PRISMA-P Group and is distributed under a Creative Commons Attribution Licence 4.0.

From: Shamseer L, Moher D, Clarke M, Ghersi D, Liberati A, Petticrew M, Shekelle P, Stewart L, PRISMA-P Group. Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015: elaboration and explanation. BMJ. 2015 Jan 2;349(jan02 1):g7647.

Supplementary File 2- Search Strategy

Search date: 18/7/2020

Database(s): Ovid MEDLINE(R) ALL 1946 - October 2020

Search Strategy:

1   Prejudice/ or Racism/
2   (racism or racial-discriminat* or racial-prejudice or racist-event* or racist-episode* or racial-stereotype* or race-related-stress).tw,kf.
3   ((discriminat* or bias* or prejudic* or hostil* or harass* or bully* or cyberbull* or cyber-bull* or (unfair* adj1 treat*) or oppress*) adj3 (race or racial* or ethnic* or cultur* or religio* or migrant* or refugee* or asylum)).tw,kf.
4   (newborn* or new-born* or baby or babies or neonat* or neo-nat* or infan* or toddler* or pre-schooler* or preschooler* or kinder or kinders or kindergarten* or boy or boys or girl or girls or child or children or childhood or pediatric* or paediatric* or adolescen* or youth or youths or teen or teens or teenage* or school-age* or schoolage* or school-child* or schoolchild* or school-girl* or schoolgirl* or school-boy* or schoolboy* or young-person* or young-people).af.
5   Child Welfare/ or pediatric obesity/et, ep, pc
6   (Prejudice/ or *Racism/ or 2 or 3) and 5
7   obesity/et, ep, pc or body mass index/ or overweight/pc
8   Waist-Hip Ratio/
9   Blood Pressure/ or Biomarkers/
10   Hypertension/et, ep, pc
11   exp Cardiovascular Diseases/et, ep, pc
12   depression/et, ep, pc or anxiety/et, ep, pc
13   Mental Health/
14   Stress, Psychological/et, ep, pc
15   Sleep/
16   exp Sleep Wake Disorders/et, ep, pc
17   "Quality of Life"/
18   Resilience, Psychological/ or exp adaptation, psychological/
19   exp substance-related disorders/et, ep, pc or alcohol-related disorders/et, ep, pc
20   smoking/et, ep or exp tobacco smoking/et, ep, pc
21   Mental Disorders/et, ep, pc
22   Self Concept/
23   personal satisfaction/
24   exp suicide/et, ep, pc
25   conduct disorder/et, ep, pc or aggression/et, ep, pc
26   pregnancy outcome/
27   (health-care or healthcare or health-service* or clinic? or ill-health or wellbeing or wellbeing or disease* or illness* or bmi or body-mass-index or anthropometric* or WHR or waist-hip-ratio or hypertension or blood-pressure or cardiometabolic or cardio-metabolic or biomarker* or obese or obesity or overweight or depress* or anxiety or anxious* or mental-health or mental-disorder* or stress or distress* or suicid* or sleep or psychosis or tobacco or smoke* or smoking or drug? or alcohol* or substance-use or substance-related-disorder* or resilien* or self-esteem or self-worth or self-concept or quality-of-life or life-satisfaction or personal-satisfaction or conduct-disorder* or aggression).tw,kf.
28   ((social or behavio* or emotion* or developmental* or psychological* or learning*) adj3 (difficul* or problem* or delay* or adjust*)).tw,kf.
29   (((pregnancy or birth or gestation*) and (outcome* or preterm or pre-term or premature or small-for-gestational-age)) or low-birthweight or low-birth-weight).tw,kf.
30   7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18 or 19 or 20 or 21 or 22 or 23 or 24 or 25 or 26
31   *obesity/et, ep, pc or *body mass index/ or *overweight/pc or *Waist-Hip Ratio/ or (*Blood Pressure/ or *Biomarkers/) or *Hypertension/et, ep, pc or exp *Cardiovascular Diseases/et, ep, pc or (*depression/et, ep, pc or *anxiety/et, ep, pc) or *Mental Health/ or *Stress, Psychological/et, ep, pc or *Sleep/ or exp *Sleep Wake Disorders/et, ep, pc or *"Quality of Life"/ or (*Resilience, Psychological/ or exp *adaptation, psychological/) or (exp *substance-related disorders/et, ep, pc or *alcohol-related disorders/et, ep, pc) or (*smoking/et, ep or exp *tobacco smoking/et, ep, pc) or *Mental Disorders/et, ep, pc or *Self Concept/ or *personal satisfaction/ or exp *suicide/et, ep, pc or (*conduct disorder/et, ep, pc or *aggression/et, ep, pc) or *pregnancy outcome/
32   (Prejudice/ or *Racism/ or 2 or 3) and (27 or 28 or 29 or 31) and 4

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33   6 or 32
34   limit 33 to (comment or editorial or letter)
35   33 not 34

Supplementary File 3- Newcastle - Ottawa Quality Assessment Scale

NEWCASTLE - OTTAWA QUALITY ASSESSMENT SCALE
CASE CONTROL STUDIES

<u>Note</u>: A study can be awarded a maximum of one star for each numbered item within the Selection and Exposure categories. A maximum of two stars can be given for Comparability.

Selection

1) <u>Is the case definition adequate</u>?
    a) yes, with independent validation ✻
    b) yes, eg record linkage or based on self reports
    c) no description

2) <u>Representativeness of the cases</u>
    a) consecutive or obviously representative series of cases ✻
    b) potential for selection biases or not stated

3) <u>Selection of Controls</u>
    a) community controls ✻
    b) hospital controls
    c) no description

4) <u>Definition of Controls</u>
    a) no history of disease (endpoint) ✻
    b) no description of source

Comparability

1) <u>Comparability of cases and controls on the basis of the design or analysis</u>
    a) study controls for _____ (Select the most important factor.) ✻
    b) study controls for any additional factor ✻ (This criteria could be modified to indicate specific control for a second important factor.)

Exposure

1) <u>Ascertainment of exposure</u>
    a) secure record (eg surgical records) ✻
    b) structured interview where blind to case/control status ✻
    c) interview not blinded to case/control status
    d) written self report or medical record only
    e) no description

2) <u>Same method of ascertainment for cases and controls</u>
    a) yes ✻
    b) no

3) <u>Non-Response rate</u>
    a) same rate for both groups ✻
    b) non respondents described
    c) rate different and no designation

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**NEWCASTLE - OTTAWA QUALITY ASSESSMENT SCALE
COHORT STUDIES**

<u>Note</u>: A study can be awarded a maximum of one star for each numbered item within the Selection and
Outcome categories. A maximum of two stars can be given for Comparability

Selection

1) <u>Representativeness of the exposed cohort</u>
    a) truly representative of the average _____ (describe) in the community ✸
    b) somewhat representative of the average _____ in the community ✸
    c) selected group of users eg nurses, volunteers
    d) no description of the derivation of the cohort

2) <u>Selection of the non exposed cohort</u>
    a) drawn from the same community as the exposed cohort ✸
    b) drawn from a different source
    c) no description of the derivation of the non exposed cohort

3) <u>Ascertainment of exposure</u>
    a) secure record (eg surgical records) ✸
    b) structured interview ✸
    c) written self report
    d) no description

4) <u>Demonstration that outcome of interest was not present at start of study</u>
    a) yes ✸
    b) no

Comparability

1) <u>Comparability of cohorts on the basis of the design or analysis</u>
    a) study controls for _____ (select the most important factor) ✸
    b) study controls for any additional factor ✸ (This criteria could be modified to indicate specific
    control for a second important factor.)

Outcome

1) <u>Assessment of outcome</u>
    a) independent blind assessment ✸
    b) record linkage ✸
    c) self report
    d) no description

2) <u>Was follow-up long enough for outcomes to occur</u>
    a) yes (select an adequate follow up period for outcome of interest) ✸
    b) no

3) <u>Adequacy of follow up of cohorts</u>
    a) complete follow up - all subjects accounted for ✸
    b) subjects lost to follow up unlikely to introduce bias - small number lost - > ____ % (select an
    adequate %) follow up, or description provided of those lost) ✸
    c) follow up rate < ____% (select an adequate %) and no description of those lost
    d) no statement