

# Insight and equality: A systematic review and meta-analysis of socio-demographic associations.

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## Systematic Review

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# Abstract

## BACKGROUND

Insight is often used in clinical and legal contexts e.g. as evidence of decision-making capacity. However, it is unclear whether this disadvantages certain groups protected under equality legislation. To our knowledge, this question has yet to be addressed systematically. Therefore, the present study reviews empirical studies that look at the relationship between insight and sociodemographic variables.

## METHODS

A systematic search of six bibliographic databases (CENTRAL, CINAHL, Cochrane Library of Systematic Reviews, EMBASE, MEDLINE and PsycINFO) was conducted, which yielded 6192 results. Study characteristics and outcomes (associations between insight and socio-demographic variables) were then extracted from 207 eligible studies. This included protected characteristics under the Equality Act (2010): age, sex, ethnicity, marital status and religion. Weighted confidence estimates were calculated and relevant moderators included in a random effects meta-analysis. A study protocol was registered prospectively on PROSPERO, ID: CRD42019120117.

## RESULTS

Insight was not strongly associated with age, gender or ethnicity. Better insight was weakly but significantly associated with white ethnicity, being employed, younger age and more years of education. The age associations were mostly explained relevant moderating variables. Cultural context (studies done in individualistic versus collectivist countries) did not moderate associations. For people with schizophrenia, the associations between sociodemographic variables and insight were comparable to associations with decision making capacity.

## CONCLUSIONS

Our results moderate some concerns over whether insight is discriminatory if used as evidence in mental capacity assessment. We have identified specific subgroups where further research is needed to clarify potential associations.

## Introduction

Clinical insight may be defined as the degree of awareness a person has that they may be suffering from a biomedical condition and its effects, and the person's willingness or ability to reflect on this [1, 2]. This

concept is often influential in clinical assessment of mental capacity [3]. For example, a recent review has found that one third of reported health and welfare cases pertaining to capacity decided by the Court of Protection in England & Wales referenced a person's 'lack of insight' [4]. It is thought that insight is relevant to terms commonly used in the functional test of capacity, such as 'appreciation' and 'using or weighing' [5]. There is particularly strong empirical evidence in psychosis for an association between insight and capacity to consent to treatment decisions [6, 7]. Insight is also frequently used as partial justification for compulsory detention under the traditional mental health laws [8]. It may therefore be relevant to concerns in Europe and the USA, about higher detention rates in people of African or Caribbean descent [9, 10], and in men of all ethnic backgrounds [11].

Although assessments of mental capacity (or competence) and assessments of compulsory treatment for mental disorder are a core part of a healthcare professional's duty, they are inherently legal assessments. In contrast, the concept of insight is inherently clinical: it is based on a judgement made by a clinician about the patient as part of making a diagnosis and planning treatment.

Critics have suggested that insight may discriminate, because it may serve as a proxy for existing value judgements that are susceptible to biases against those with protected characteristics like age, gender, ethnicity and religion or belief [12, 13]. This is a concern, not least because judges in the courts must interpret clinical evidence from a lay perspective. Such discrimination is likely to be indirect – in other words – the application of a legally neutral concept in such a way as to produce an unjustified and adverse difference in treatment on the basis of a particular status. If the application of the concept of insight in practice leads to such discrimination, then reliance upon it to justify either a finding of mental incapacity or detention under mental health legislation would be questionable.

Before we question whether insight is an indirectly discriminatory construct we must first identify where disparities exist. That is, are certain groups more likely to be judged as having poor insight? We sought to determine whether insight is associated with such non-cognitive variables by means of a systematic review and meta-analysis of the scientific literature. If insight is not applied in a discriminatory fashion, we would not expect to find large disparities between socio-demographic groups, or between physically disabled and non-disabled groups. Furthermore, any observed disparities would be capable of an explanation and/or justification based upon a factor relevant to that group. We hypothesised that:

- a. No sociodemographic factor will strongly predict insight across all clinical populations

- b. If a sociodemographic factor predicts insight, a conceptually relevant variable to that factor will explain some of the variance in this relationship
- c. No sociodemographic factor will predict insight to a significantly stronger extent than it predicts mental capacity.

Owing to its multiply-determined and dynamic nature, there are several conceptual models of insight that have resulted in different measures and these must be taken into account in the review. Five main procedures exist for operationalising or quantifying insight [14]: i) a clinician's statement on a patient 'having' or 'lacking' insight in a clinical report; ii) a clinician's rating on a validated scale, based on a routine, structured or semi structured interview; iii) a person's rating on self-report instruments; iv) the discrepancy between the individual's own and caregiver ratings on a list of behaviours and abilities; and v) the difference between subjective ratings and objective scores on a neuropsychological test. Although concepts of cognition and illness can vary considerably between cultures [15] there has been less attention paid to socio-cultural variations in insight. Therefore, we sought to investigate this by pooling together international studies. Finally, we sought to test the following novel hypothesis:

- d. Sociodemographic associations with insight will not vary between individualist and collectivist countries

Previous attempts to address the issues underlying our hypotheses have tended to be unsystematic and partial. A comprehensive but non-systematic narrative literature review of clinical studies 15 years ago found mixed results, with no conclusive evidence of major demographic influences on insight [16]. Although many of the studies cited found no significant relationship between insight and sociodemographic factors, some significant relationships were reported, and the overall effects were unquantified and remain unexplained.

## Methods

### search strategy

For the present review, we developed a tailored search strategy based on relevant keywords, headings and subject headings, using six online bibliographic databases: CENTRAL, CINAHL, Cochrane Library of Systematic Reviews, EMBASE, MEDLINE, PsycINFO. Example search terms for insight included "clinical insight", "anosognosia", "awareness of deficit" and several common insight measures. We conducted the initial search on 1<sup>st</sup> March 2019 and updated this on 2<sup>nd</sup> October 2020. Time restrictions were not set.

## selection criteria

One reviewer (K.A) led the study selection and another reviewer (G.O) conducted reliability checks for 10% of full text articles. This was done according to a prospectively published protocol (see Appendix). We achieved a kappa statistic of 0.8, indicating very substantial inter-rater agreement [17].

In brief, peer-reviewed journal articles were selected if they reported a) in English b) using a cross-sectional or more robust design c) a categorical or continuous measure of clinical insight d) the results of a statistical test comparing insight and at least one socio-demographic or disability variable of interest (age, sex, ethnicity, religion, marital status, education, employment or socioeconomic status, physical health disability) and e) the relevant analysis included at least 20 participants (or 10 per group). We retrospectively excluded samples with neurodevelopmental and rare genetic disorders, or with children samples, due to minimal results from these populations.

The initial database search produced 6192 results, of which 1028 potentially relevant studies were screened at full text level and 145 were deemed eligible for inclusion (see Figure 1). A forward citation and backward reference search of eligible studies was conducted using SCOPUS, which yielded a further 62 eligible studies. All 207 eligible studies were included for qualitative synthesis and 130 studies were also selected for meta-analysis, based on further eligibility criteria (see Appendix).

We modified our protocol following its initial registration to remove social influence variables from our criteria, as scoping searches revealed this would yield few results. We also restricted our criteria to include only complete or well validated clinical insight scales, to improve specificity. Selection queries were taken to G.O in the first instance, with A.D the final arbiter if there was a disagreement.

## data extraction

One reviewer (K.A) extracted relevant data from all eligible studies, recording this on a spreadsheet. G.O independently extracted data from 10% of eligible studies, to evaluate consistency. The primary outcome of interest was the association of sociodemographic data (age, sex, ethnicity, marital status, religion, age at onset, education, employment status and socioeconomic status) with insight (measured either continuously or categorically). This was used to calculate the proportion of studies that found at least

one significant association with the protected characteristic, the group rated as having significantly better insight (if any) and the method of insight assessment most often associated with these changes. In the event of duplicate datasets, in the first instance we prioritised the article that reported the most detailed statistical test. Alternatively, we excluded the most recently published article. For ethnicity, we considered either white vs. non-white where possible, or alternatively white vs. the most populous non-white group.

We also extracted variables that we considered to be potential moderators. We contrasted different types of insight scales, including self-report scales, clinical judgement scales, dual-rater discrepancy scales and unstructured clinical judgement. We then ranked the country of origin for each study, according to a cultural measure. The Hofstede Individualism Index is a survey-based cross-cultural measure that provides an indication of societal integration, in which the most individualistic countries have the highest figure [18].

Finally, as pre-specified in our protocol, we selected relevant variables for our moderator analysis. We considered, for example, whether associations may vary between people with psychiatric (schizophrenia, depression, bipolar disorder or obsessive-compulsive disorder) or neurological diagnoses (dementia, stroke, brain injury or mild cognitive impairment). We also considered the role of cultural individualism and measurement type.

## **data analysis**

A random effects meta-analysis was conducted using R Statistics. We used the Restricted Maximum Likelihood (REML) method and effect sizes were weighted by inverse sampling variance. We calculated Cohen's *d* when insight was measured as a continuous variable, using established conversion metrics (see Appendix for overview). We calculated Odds Ratios (ORs) where insight was measured as a binary judgement, although artificially dichotomised sociodemographic variables (age, education, etc) were excluded. For samples in which two or more different insight measures were reported, we calculated a single mean effect size to adhere to the independence assumption. Eligible studies that did not report sufficient information, only adjusted effect sizes were included in the qualitative synthesis only. Each study required a minimum of 20 participants for inclusion into the meta-synthesis and at least ten participants from each group to provide a minimum degree of statistical power. Finally, we conducted sensitivity analyses to assess risk of bias, including heterogeneity (eg.  $I^2$  statistic), publication bias and analytic decisions. The full data analysis plan is included in the Appendix.

## **Results**

## **characteristics of included studies**

A final 207 studies were eligible for inclusion. 75 studies were included in the continuous meta-analysis and 56 studies were included in the odds ratios meta-analysis (see Appendix). 301 effect sizes were derived from these studies [19-148]. The remaining 77 studies were retained for qualitative synthesis only [14, 149-224]. An estimated 16522 (M= 79.82) participants were included in the meta-analysis, with 1432 participants in the largest independent sample.

We adopted a modified version of Cohen's criteria to interpret effect sizes (no effect = below 0.1, small effect = 0.1 to 0.3, moderate effect = 0.3 to 0.5, large effect = 0.5 or above), in line with similar research [7]. Just over half of the reported effect sizes suggested either small or zero association between sociodemographic characteristics and insight (See Appendix). We were unable to find sufficient samples for many of the sociodemographic variable of interest (religion or belief, sexual orientation, pregnancy and maternity and gender reassignment).

For a full overview of included studies, analytical decisions and sensitivity analyses, see the Appendix. Two effect sizes were excluded as outliers from each meta-analysis [20, 48]. Other than marital status, heterogeneity was low-to-moderate for each variable and there was little evidence of publication bias.

## **sociodemographic predictors of insight (continuous)**

Demographic	k	Weighted Mean d	95% CI	P	I <sup>2</sup>
Younger age	67	0.21***	[0.15, 0.28]	< .0001	52.22%
Better educated	43	0.16**	[0.07, 0.25]	.005	57.59%
Employed	7	0.23*	[0.06, 0.39]	.007	14.34%
White ethnicity	3	0.25*	[0.04, 0.47]	.018	0%
Married/Relationship	12	0.14	[-0.08, 0.37]	.209	84.29%
Female	27	0.05	[-0.06, 0.16]	.359	61.60%

Table 1. The association of sociodemographic factors with insight when measured as a continuous variable. \*p <.05 \*\*p <.01 \*\*\*p< .001

When expressed as a precise effect size, white ethnicity (d= 0.25), being employed (d= 0.23), younger age (d= 0.21), and more years of education (d= 0.16) significantly predicted poorer insight to a weak degree. We found no evidence of marital status (d= 0.14) or sex (d= 0.05) predicting insight. According to our effect size criteria, these sociodemographic variables seem to contribute to a small proportion of the variance in insight across populations.

## sociodemographic predictors of insight (dichotomous)

Demographic	K	Odds Ratio	95% CI	P	$I^2$
Younger age	47	0.24***	[0.13, 0.34]	< .0001	4.29%
Better educated	30	0.17*	[0.04, 0.30]	.012	0.00%
Employed	3	0.38	[-0.48, 1.24]	.386	58.72%
Married/Relationship	7	0.20	[-0.46, 0.86]	.556	75.70%
White ethnicity	3	0.27	[-0.86, 1.39]	.640	47.46%
Female	49	0.15*	[0.02, 0.29]	.026	10.85%

Table 2. The odds associated with better insight when measured as a dichotomous variable. \*  $p < .05$  \*\*\*  $p < .0001$

Similar to the first meta-analysis, people were more likely to be judged as having good insight if they were younger (OR= 0.24,  $p < .0001$ ) and had more years of education (OR= 0.17,  $p < .05$ ). Females were also more likely to be judged as having good insight (OR= 0.15,  $p < .05$ ), although this result may have been affected by influential cases (see below). The effects sizes were all small. No other odds ratio reached statistical significance, possibly due to the low sample sizes.

## moderation and subgroup analyses

We found some evidence that these effects may be context specific, when insight was measured as a continuous variable. The association of age with insight was significantly moderated by the type of diagnosis - that is, whether it was a psychiatric or neurological population ( $p < 0.001$ ). Subgroup analyses revealed that older age was moderately associated with poor insight in neurological populations ( $d = 0.31$ ,  $p < 0.0001$ ). Conversely, the association between younger age and good insight was far weaker in psychiatric samples ( $d = .12$ ,  $p < .05$ ).

The association of age with insight was also (marginally) significantly moderated by the type of insight scale used ( $p = 0.057$ ). Older age significantly associated with poor insight when discrepancy scales ( $d = 0.16$ ,  $p < 0.05$ ) and clinician-rated scales were used ( $d = .16$ ,  $p < .05$ ) but not for clinical self-report scales. Finally, the association between insight and sociodemographic variables was not moderated by culture, as measured by the Hofstede Individualism Index (all  $p > .05$ ).

These subgroup analyses are reported in more detail in the Appendix.

Demographic	N	d	95% CI	p
Younger age	22	0.10	[-0.00, 0.21]	.059
Better educated	15	0.22	[0.05, 0.39]	.012
Married/Relationship	8	0.17	[-0.02, 0.37]	.077
Female	18	0.00	[-0.12, 0.13]	.983

**Table 3.** Sociodemographic predictors of insight (continuous) for the Schizophrenia subsample.

As shown in Table 3, we also conducted a subgroup analysis of schizophrenia samples, in order to test our third hypothesis comparing insight (as a continuous measure) with mental capacity. We observed a stronger effect of more years of education ( $k = 15$ ,  $d = 0.22$ , CI [0.05, 0.39]) predicting better insight. However, this effect was not significantly greater than in the non-schizophrenia samples ( $k = 28$ ,  $d = 0.12$ , CI [0.02, 0.23]). We found no evidence for age, marital status or sex predicting insight in Schizophrenia samples (all  $p < .05$ .) and we did not have sufficient data to include employment or ethnicity in this analysis. These results are broadly similar to associations found with mental capacity.

# qualitative synthesis

A low proportion of studies reported at least one significant association between insight (at baseline) and any of the sociodemographic variables included in the meta-analysis (see Appendix). Most of these effects were found in both directions, which would seem to support the quantitative findings above. However, some significant associations were found between insight and other sociodemographic variables, which we outline below. A minority of study authors proposed explanations for significant effects. We provide an overview of these explanations in the Appendix.

Two Indian studies of schizophrenia samples also found that people from urban areas had significantly better insight than people in rural areas (both  $p < .005$ ) [20, 66]. The latter suggested that this was due to variations in cultural beliefs surrounding illness, although this was only supported with secondary evidence. A further two studies, in China [63] and India [85], found no significant differences in insight between urban and rural populations, although their samples are not directly comparable by diagnosis.

Only two studies found that higher socioeconomic status predicted better insight, both in psychosis samples [150, 166]. Each of these effects were relatively strong ( $p < .01$ ). However, the remaining six studies did not find a significant relationship between socioeconomic measures and insight. These included two dementia [190, 193] and four schizophrenia samples [62, 66, 74, 194]. Finally, a positive relationship was found between BMI and insight in one sample of people with bipolar disorder [217] but not in another eating disorder sample [153] and two studies found no significant association between insight and religion [177, 216].

Table 4 outlines the explanations proposed by authors when these associations were found.

tor d t	Proposed Explanations			
	Clinical	Psychosocial	Methodological	Neurocognitive
age	Prolonged experience with disorder	Age-related psychological functions, coping mechanisms	Sampling bias (adolescent samples), interviewer bias	Developmental trajectories in children
er	Neurodegeneration, functional impairment, early diagnosis, illness onset, illness duration	Age-related beliefs, coping mechanisms, learning processes, upbringing styles	Sampling bias	Differences in premorbid functioning
ion		Compensatory mechanisms, access to support, illness knowledge, learning processes		Cognitive reserve, intellectual functioning
r	Functional impairment, illness severity, illness duration		Rater bias, measurement bias	
n	Disease onset, antipsychotic response	Gender norms, coping mechanisms, cultural norms		Gender differences in verbal memory
e		Cultural constructions of illness, client-patient interaction	Dropout rates, racial bias in evaluation	
r				

Table 4. A brief summary of possible explanations for the relationship between insight and sociodemographic variables, as outlined by study authors (n > 5 studies).

## Discussion

The present review and meta-analysis largely corroborate previous findings from non-systematic research [16]. That is, more often than not, empirical studies find no association between insight and major socio-demographic variables. In order of strength, we found weak but significant effects for white ethnicity, being employed, younger age and better education predicting better insight scores (all effect sizes <0.3). When we had sufficient statistical power, we found similar results when insight was measured as a binary clinical judgement as when measured as a dimension although the association with insight and ethnicity and insight and employment went away when binary judgement was used. These findings suggest that none of the protected characteristics relevant to equality legislation that we were able to analyse is strongly associated with insight.

The only moderate association was found within a subgroup of patients and this was explained by conceptually relevant variables. Older age only significantly predicted poorer insight in neurological samples, with a moderately strong effect size ( $d = .31$ ). To our knowledge, this is the first empirical analysis to investigate this. The relationship between age and insight is usually attributed to dementia

severity and age-related cognitive decline [225, 226]. This may explain why the age effect was mostly found in discrepancy scales, which are predominantly used for people with neurological conditions. Neurodegeneration would therefore seem a plausible explanation for these age-related disparities. We also found no quantitative evidence that the association between insight and sociodemographic variables varied by cultural individualism.

The positive associations of continuous measures of insight with white ethnicity and being employed could not be explained by conceptually relevant variables in the present study. This is partly because the number of samples was relatively low, therefore it was difficult to detect variations in a relatively small and homogenous effect. It is plausible that people with poor insight in the employment studies, who had schizophrenia, bipolar disorder or OCD, may have had greater functional impairment [94, 113, 227]. Regarding ethnicity, the only explanations proposed by authors were psychosocial and methodological and were not supported by primary evidence. As a result, we cannot conclude from the current literature whether the weak association between insight scales and ethnicity is explained.

Both our moderator analysis and qualitative synthesis indicate the potential for contextual effects. In order to understand fully whether insight is discriminatory it will be necessary to investigate these associations further. This requires the acquisition of more data on protected characteristics and more qualitative studies to get inside contextual effects. Most of the studies reviewed contained no explanation for any observed disparity. A minority of authors attributed observed effects to study-level bias (eg. small or unrepresentative sampling). Many clinical explanations were proposed, such as differences in illness prevalence, duration and trajectory. Most of these assertions cry out for more empirical support. Interestingly, a number of unmeasured psychosocial factors were proposed as intermediary factors, including acceptance of symptoms, normative behaviours, conceptualisations of illness and coping styles. These should be considered particularly when informant reports are used to provide a discrepancy rating of insight.

Finally, we compared our findings to a systematic review of decision-making capacity (DMC) for people with schizophrenia [7]. Similar to the results presented here, that review found almost no evidence of age and sex predicting DMC, and some weak evidence of positive associations with white ethnicity and more years of education. This would suggest that insight is no more discriminatory than capacity on these variables. It should be noted that our study of insight and [7] did not measure use of compulsory treatment for mental disorder where assessments involve the concept of risk rather than just insight or mental capacity.

## strengths

This is the first empirical study, to our knowledge, to address the question of whether insight assessments are potentially discriminatory. This directly addresses a recommendation made by the UK government's recent Independent Review of the Mental Health Act (1983) [13] but is by no means of UK relevance only. We believe the present review to be the most comprehensive of sociodemographic predictors of insight to date. Meta-analytic methods are frequently applied to neurocognitive associations of insight; however, the present paper is novel in that it extends this approach to social variables. Our mixed methods approach has also enabled us to investigate the issue from different perspectives and the results were mostly consistent. Our moderator analysis was able to shed light on these associations in greater detail, where they may otherwise have been overlooked, while our qualitative analysis also benefits from the additional studies that could not be included in the meta synthesis. Finally, we found no indication that our meta-analysis was biased towards significant effects.

## limitations

Although we sought to evaluate a range of associations, few studies reported on physical health disabilities, and most of the protected characteristics under the Equality Act (2010) were rarely measured (religion or belief, sexual orientation, pregnancy and maternity and gender reassignment). We also note that the General Comment 1 from the Committee on the Rights of Persons with Disabilities considers that the very concept of DMC is discriminatory [228], which would mean that any reliance on a concept such as insight which would underpin a finding of a lack of DMC would, equally, and by definition, be discriminatory on the basis of disability. Even without taking this radical interpretative step, it is crucial to keep the possibility of discrimination in such an ethically important area under continuing review.

Furthermore, this study is limited to measures of insight in research studies rather than use of insight in practice. A review of insight in practice in England's Court of Protection, building on previous work [4], shows that practice rarely uses structured measurement of insight and that standards can be improved (ref).

We were often limited to post-hoc examinations, because sociodemographic factors were rarely a focus of individual studies. For this reason, we were relatively inclusive in our sampling criteria. This potentially increased the risk of bias but also enabled us to test for moderators. Despite this, heterogeneity was mostly kept to moderate levels.

## Conclusion

Our study demonstrates that none of the included sociodemographic variables relevant to equality legislation were strongly associated with insight across all populations. These results should give some reassurance that insight does not indirectly discriminate in important ethical and legal assessments like mental capacity, but only if used as intended. We raise some possible concern for people from a black ethnic background and people who have poor access to external supports. These subgroups were the most likely to have measures of poor insight, which could place them at increased risk of indirect discrimination. Future research should explore disparities in groups that have been poorly represented in empirical and qualitative research on insight.

## Declarations

Ethics approval and consent to participate

Not applicable.

Consent for publication

Not applicable.

Availability of data and materials

The datasets generated and analysed during the current study are included in this published article and its supplementary information files. Any data queries may also be directed to the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

K.A. led at each stage of the project, including drafting the document. G.O. was primary supervisor on the project and made substantial contributions in all aspects of the study. A.D and A.R.K also supervised the project throughout and made substantial contributions to the conception of the study, the interpretation of the results and critical revisions. All listed authors have approved for the work to be published and fully meet the ICMJE criteria for authorship. The authors agree to be accountable for the contents of the paper and are jointly responsible for ensuring that all queries related to the accuracy or integrity of the work are investigated and resolved.

Acknowledgements

Not applicable.

## References

Please see the supplementary files section to view the references.

## Figures

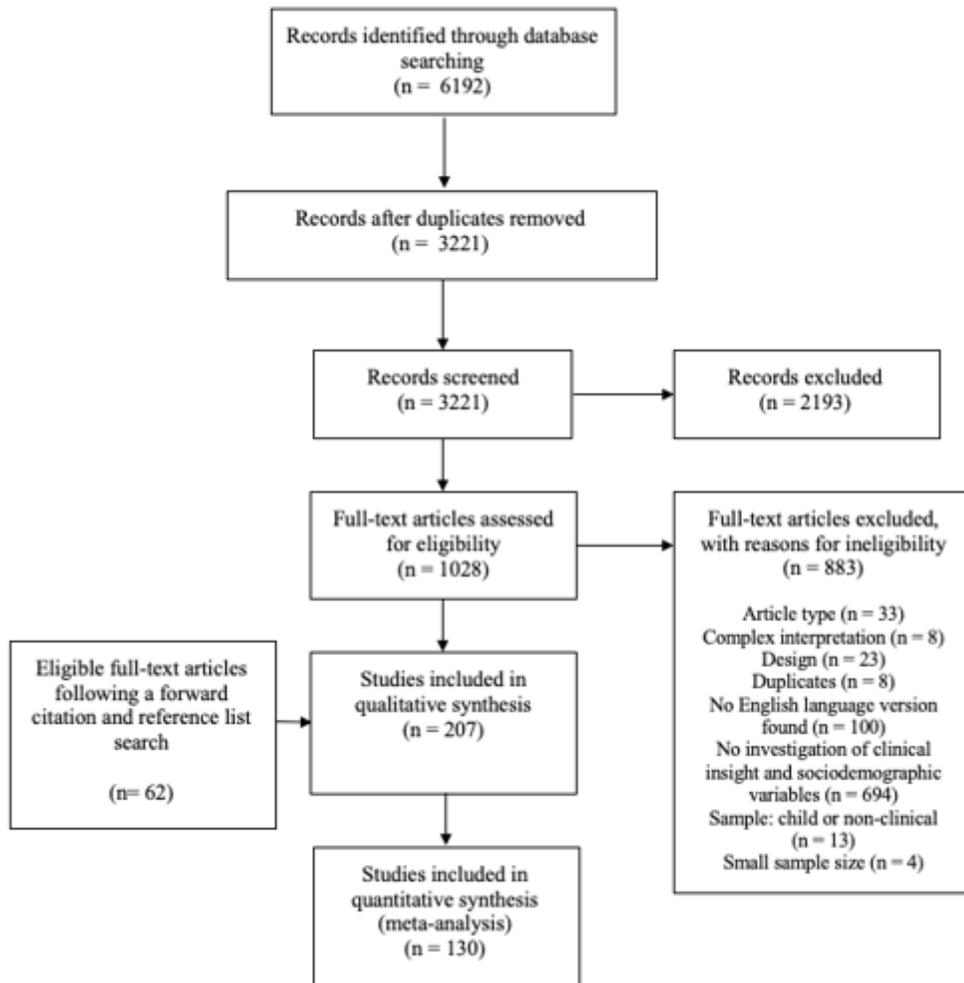


Figure 1

A PRISMA flow diagram outlining the study selection procedure.

## Supplementary Files

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