

Men, Loneliness, and Mental Health: A Meta-Analysis



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### Abstract

**Purpose:** Loneliness has been described as a growing problem within modern western societies - particularly among men, with male loneliness and male suicide both on the rise. To date, the strength of the association between loneliness and men's mental health (i.e., symptoms of depression, anxiety, distress, suicidal ideation) has not been meta-analysed. The current meta-analysis addresses this research gap and examines potential methodological (e.g., measurement type, sampling method) and sample (e.g., age) variables that may moderate the relationship between loneliness and mental health in men. **Research Methods:** Sixteen observational studies ( $N_{\text{participants}} = 22898$ ) were identified from the Embase, PsycINFO, and Medline databases (no date limits), and evaluated using the Newcastle - Ottawa quality assessment scale for cross-sectional studies. Pearson's  $r$  effect sizes were pooled using random effects and mixed effects modelling. **Results:** Moderate and positive effects were found between loneliness and all mental health symptom domains ( $r_{\text{w range}} = .39$  to  $.52$ ); as loneliness increased symptomology also increased. Recruitment source contributed significantly to this association, with stronger effects identified in help-seeking samples. **Conclusions:** Loneliness poses a significant risk factor for men's mental health. Interventions to reduce loneliness, and the associated mental health consequences, may need to consider how they can be suitably adapted to the needs of men across the lifespan. Further research can expand on these findings by recruiting a more diverse sample of men but also by considering how adherence to masculine norm's may influence male loneliness.

*Keywords: Loneliness, Depression, Anxiety, Distress, Suicidal Ideation, Men's Health*

**Declaration**

This thesis contains no material which has been accepted for the award of any other degree of diploma in any University, and, to the best of my knowledge, this thesis contains no material previously published except where due reference is made. I give permission for the digital version of this thesis to be made available on the web, via the University of Adelaide's digital thesis repository, the Library Search and through web search engines, unless permission has been granted by the School to restrict access for a period of time.



19<sup>th</sup> September 2023

**Contributor Roles Table**

<b>ROLE</b>	<b>ROLE DESCRIPTION</b>	<b>STUDENT</b>	<b>SUPERVISOR 1</b>	<b>SUPERVISOR 2</b>
<b>CONCEPTUALIZATION</b>	Ideas; formulation or evolution of overarching research goals and aims.	X		X
<b>METHODOLOGY</b>	Development or design of methodology; creation of models.	X	X	X
<b>PROJECT ADMINISTRATION</b>	Management and coordination responsibility for the research activity planning and execution.	X		
<b>SUPERVISION</b>	Oversight and leadership responsibility for the research activity planning and execution, including mentorship external to the core team.	X	X	
<b>RESOURCES</b>	Provision of study materials, laboratory samples, instrumentation, computing resources, or other analysis tools.		X	
<b>SOFTWARE</b>	Programming, software development; designing computer programs; implementation of the computer code and supporting algorithms; testing of existing code.		X	
<b>INVESTIGATION</b>	Conducting research - specifically performing experiments, or data/evidence collection.	X		
<b>VALIDATION</b>	Verification of the overall replication/reproducibility of results/experiments.	X	X	
<b>DATA CURATION</b>	Management activities to annotate (produce metadata), scrub data and maintain research data (including software code, where it is necessary for interpreting the data itself) for initial use and later re-use.	X		
<b>FORMAL ANALYSIS</b>	Application of statistical, mathematical, computational, or other formal techniques to analyse or synthesize study data.	X		
<b>VISUALIZATION</b>	Visualization/data presentation of the results.	X		
<b>WRITING – ORIGINAL DRAFT</b>	Specifically writing the initial draft.	X		
<b>WRITING – REVIEW &amp; EDITING</b>	Critical review, commentary, or revision of original draft	X	X	

## Introduction

Loneliness, or the perceived discrepancy between one's desired and actual social relationships (Perissinotto et al., 2012), has been hypothesised as a 'growing problem' within modern societies due to its relation to poor health outcomes (Cacioppo & Cacioppo, 2018). For instance, there is evidence that loneliness is related to all-cause mortality (Rico-Uribe et al., 2018) and a broad range of adverse mental health outcomes (Erzen & Çikrikci, 2018; Maes et al., 2019; McClelland et al., 2020; Park et al., 2020). Cacioppo et al. (2010) found that loneliness predicted increases in depression, but that depression did not increase loneliness - suggesting that loneliness may be a key determinant of mental ill-health. The social restrictions prevalent throughout the Covid-19 pandemic has further focussed attention on the potential negative effects of loneliness among vulnerable populations (Dahlberg, 2021; Ernst et al., 2021). This finding may be particularly true for men; a population that is disadvantaged in health outcomes. Significantly, men comprise 75% of suicides in western countries (Australian Bureau of Statistics, 2021; Centers for Disease Control, 2023) and have the highest deathrates across the lifespan (Connery, 2003).

Heightened loneliness among men may reflect the fewer social relationships that they experience, compared to women (Courtenay, 2003). Research suggests that men primarily rely on their partners for social and emotional support (e.g., Antonucci & Akiyama, 1987; Flood, 2005). This overreliance on partners may facilitate men in maintaining both restricted and unsatisfactory social networks (Alpass & Neville, 2003). Indeed, men have reported receiving and giving less emotional support from individuals other than their spouses (Fuhrer & Stansfeld, 2002; Liebler & Sandefur, 2002). It is tempting to think that men are satisfied with more restricted social networks, hence lacking a discrepancy between their actual and desired levels of social support. However, qualitative findings suggest that men do desire deeper social connections with others but face challenges in building and maintaining these

connections (Ratcliffe et al., 2020). The challenges they face are varied but typically include: a perceived lack of receptive audience, not knowing how to talk about their feelings, a lack of trust, and feelings of shame/embarrassment surrounding seeking emotional support (Bryant-Bedell & Waite, 2010; McKenzie et al., 2018; Ratcliffe et al., 2023). These challenges are thought to arise as a consequence of men engaging in self-regulatory behaviours to maintain a masculine identity (as opposed to a feminine one; Tannenbaum & Frank, 2011). Accordingly, gender differences in an individual's willingness to admit personal distress, vulnerability, or loneliness have been shown to disappear when accounting for masculinity as operationalized by the Bem Sex Role Inventory (Bem, 1974; Cramer & Neydley, 1998).

Conformity to dominant masculine norms may also provide a useful avenue for understanding male loneliness. For example, the literature has often pointed to masculinity being idealised by norms of self-sufficiency, emotional distancing, and stoicism within western cultures (Addis, Mansfield, & Syzdek, 2010; Pleck, 1995; Sileo & Kershaw, 2020). Adherence to these masculine norms may explain a male reluctance to engage in help-seeking behaviour (Addis & Mahalik, 2003; Seidler et al., 2016). This reluctance to seek formal support runs in a parallel process to male loneliness. That is, in seeking to exemplify masculine norms, men may then lead insular social lives (Blazina et al., 2007). Desire to adhere to these masculine norms may, as such, underly the challenges men face in building and maintaining their desired quantity and quality of social relationships (McKenzie et al., 2018). Solely relying on romantic relationships to provide emotional support allows men to publicly present as adhering to masculine norms while restricting their perceived vulnerabilities to a private domain (McKenzie et al., 2018). Notably, self-reliance and personal autonomy are highly valued in individualistic cultures, where men have been reported to be at heightened risk of experiencing loneliness (Barreto et al., 2020; Mansour et al., 2021). That said, men are not a homogenous group, with between-group differences in

conformity to harmful masculine norms (and thus related outcomes) noted in the literature (e.g., Herreen et al., 2021). For instance, there is suggestion that younger men are embracing a newer form of masculinity which encourages emotional openness and intimacy even within same-sex social relationships (Robison et al., 2010). Nonetheless, understanding the broad similarities among men is a foundational step before delineating the differences between men (Brooks, 2010; Gierveld et al., 2018; Ratcliffe et al., 2023).

### **1.1 Methodological Considerations**

A key consideration within the loneliness literature is the conceptual distinction between loneliness and social isolation. Social isolation describes the objective state of the social relationships (or lack of) available to an individual (Cacioppo et al., 2011). In this way, social isolation is concerned with objective quantity (Cacioppo et al., 2011). In comparison, loneliness is a multifaceted concept which encapsulates not only both (a perceived lack of) quantity and quality of social relationships, but also accommodates feelings of vulnerability (Yanguas et al., 2018). Thus, it is conceivable that an individual may be socially isolated (or lack social relationships) but is entirely satisfied with their situation, and therefore not lonely. Conversely, it is possible for an individual to have many social connections but still feel unsatisfied with their current social relationships (Park et al., 2020). For this reason, loneliness has sometimes been described as perceived social isolation (Cacioppo & Hawkley, 2003). The lack of clear demarcation between these concepts has caused some researchers to use these terms synonymously (Valtorta, 2016; Wang et al., 2017). In a review of social isolation and loneliness, Valtorta et al. (2016) proposed that social isolation measures related more to the structure of an individual's social relationships (e.g., Litwin Support Network Type; Litwin, 1997), whereas loneliness measures enquired about the functional aspects of social relationships (e.g., UCLA Loneliness Scale; Russel et al., 1980).

A related, contentious issue is the operationalisation of loneliness. A hallmark meta-analysis by Pinqart & Sorensen (2001) found exaggerated gendered differences in loneliness (with women reporting more loneliness) for studies using either single-item measures of loneliness or The University of California, Los Angeles Loneliness Scale (UCLA; Russel et al., 1980) but not for those using the de Jong-Gierveld scale (Gierveld & Kamphuis, 1985). That said, single-item measures may also underestimate loneliness for men as they tend to directly inquire about experiences of loneliness (“*Over the past X time how much do you agree with the following statement: ‘I feel completely alone.’*”; Seidler et al., 2022). Questions of this nature require the participant to self-label, which may be more difficult for those subscribing to masculine norms. Men do not always admit to being lonely (Gierveld et al., 2018) and may be less able to label themselves as such (Borys & Perlman, 1985). Further, men who are perceived as lonely receive more stigmatisation than women who are perceived as lonely (Borys & Perlman, 1985; Lau & Gruen, 1992). It may be that issues with self-labelling are not entirely self-imposed adherence to masculine norms but are at least partially reinforced by societal expectations of one’s gender role.

Methodological heterogeneity extends to the different recruitment strategies employed within observed studies. Although psychological measures seem to hold their psychometric properties when delivered online (Buchanan & Smith, 1999; Fortson et al., 2006), samples recruited from the internet may be unrepresentative of the general population due to a selection bias (Blank & Lutz, 2017; Eysenbach & Wyatt, 2002). This selection bias is likely a function of when and where (i.e., what website) a psychological study is advertised on or recruited from (Khazaal et al., 2014). One example is HeadsUpGuys; a leading resource for providing psychoeducation on male depression and suicide risk (<https://headsupguys.org/>; Ogrodniczuk et al., 2018). Individuals recruited from this global site may have been seeking help and thus have higher prevalence rates of mental health symptoms than seen in the

general population (e.g., Brown et al., 2023; Keum et al., 2021; Ogrodniczuk et al., 2023; Seidler et al., 2022; Sharp et al., 2023). Indeed, greater internet use has been associated with increased loneliness among a community sample (Kraut, et al., 1998), though at least one study has found this association did not exist for men (Amichai-Hamburger & Ben-Artzi, 2003). Participants recruited online have also reported significantly poorer mental health (i.e., symptoms of depression and anxiety; Kaźmierczak et al., 2023), although there is some evidence that internet-based samples are comparable to traditional samples (i.e., participants recruited offline; Gosling, et al., 2004; Whitehead, 2011) on mental health variables (e.g., depression, anxiety).

Loneliness research has also often taken a gerontological approach (Ernst et al., 2021), which pertains to the stereotype of the lonely old person (Perlman, 1998). Ageing may bring unique difficulties for men, as the independence associated with successful ageing in western societies is tied to their attempts to maintain both their masculine identity and navigate their identity as an older person (Smith et al., 2007). However, empirical evidence suggests that the stereotype of the lonely older person is generally untrue, with loneliness being similarly prevalent throughout the lifespan; only the oldest old (80+ years) show heightened levels of loneliness in comparison with other groups (Dykstra, 2009). Opposite to pop culture expectations, findings from a recent survey suggested that loneliness decreased as age increased (Hammond, 2018). Regardless, particular attention has been given to address loneliness in older males. For example, men's sheds, which target loneliness in older adult males by providing a gendered space to promote positive social activity and a sense of social support, have shown to decrease mental ill-health and promote wellbeing (Milligan et al., 2016). Given that loneliness may be prevalent across the lifespan, there is value in understanding whether loneliness' potency as a risk factor for poor mental health outcomes is just as consistent, so that targeted interventions for younger men can also be considered.

## 1.2 Current Study

Loneliness represents a substantial risk to men's mental health. Men may face unique circumstances that impact their ability to create satisfactory social networks. Gender socialisation and adherence to masculine norms may maintain these circumstances. Empirical evidence also suggests that loneliness may be prevalent across all age groups, in contrast to the traditional gerontological approach that this research has taken. Notably, previous meta-analyses have considered loneliness through a gendered lens (e.g., Maes et al., 2019). To date, none have investigated how loneliness impacts mental health outcomes for men. Given the increasing interest in the benefits of a gendered approach to health for men (Robertson et al., 2018; Sharp et al., 2022), this meta-analysis set out to examine the mental health outcomes associated with perceived loneliness among men. A secondary aim was to investigate study (i.e., measurement methods, recruitment source) and sample-level characteristics (i.e., mean age) that may explain the relationship between men's loneliness and their mental health.

## Method

### 2.1 Literature Search

An electronic search of APA PsycInfo, Ovid MEDLINE, and Ovid Embase was conducted, using terms relating to *men* (e.g., male, men, mate), *loneliness* (e.g., lonely, loneliness, isolation), and *mental health* (e.g., distress, mental health, self-harm). Search terms were adapted to the specific language requirements of each database with the assistance of a research librarian (see Appendix 1). Scopus was then used to conduct a citation search of studies identified for inclusion from the initial database search. A search of Google Scholar (up to page 15; ~150 results) using broader related terms (i.e., male, distress, loneliness) was then carried out to identify potentially relevant studies that may have been missed through the initial database search (Bramer et al., 2017). This search was supplemented by manually reviewing the reference lists of included studies (Horsley et al., 2011). A protocol for this review was registered on the International Prospective Register of Systematic Reviews on 6<sup>th</sup> of August 2023 [protocol number blinded for peer review].

### 2.2 Eligibility Criteria

Only studies containing a 100% adult male sample (i.e.,  $\geq 17$  years; consistent with the minimum entry age of consent for accessing mental health services in Australia; Mental Health Coordinating Council, 2021), or with a male sub-analysis, were included. Studies were also required to use a standardised and validated loneliness scale, or a single-item ordinal measure that inquired about feelings of loneliness (i.e., to reflect the functional aspects of social relationships; Valtora et al., 2016). A previous meta-analysis identified a high correlation between these two measurement types, both within and across studies (Pinquart & Sorensen, 2001). Further, studies needed to include a mental health outcome (defined as symptoms of depression, anxiety, distress, or suicidal ideation) via a multi-item standardised scale. In terms of design, only observational studies were eligible. Longitudinal

studies were included if relevant baseline data was available as the current analysis was only interested in cross-sectional correlations. Finally, eligible studies were required to be available in the English language.

Studies were excluded if the sample was drawn from a clinical or medical treatment seeking population, as these populations may have unique circumstances that influence mental health outcomes (Goodell et al., 2011). Studies were also excluded if gender differences were not examined (i.e., data were not reported separately for participants identifying as male). Studies that did not report correlation  $r$  as an effect size were also ineligible; using Beta-Coefficients to impute missing correlational effect sizes is controversial within the literature given the potential for inaccurate estimates (Hunter & Schmidt, 1990; Peterson & Brown, 2005). Authors of included studies were contacted, where required, to verify study eligibility.

Records were imported into Covidence software for systematic reviews (Veritas Health Innovation, 2023). Titles and abstracts were initially screened for potential relevancy by the author. The full texts of studies identified as possible candidates were then rescreened by the author against the listed eligibility criteria. To check the reliability of the screening process a random subset of 100 studies (Furey, 2022) were screened by an independent student researcher (X.X) with good inter-rater reliability achieved (Cohen's  $\kappa = .87$ ).

### **2.3 Data Collection and Preparation**

Consistent with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses statement (Page, 2021), a purposely designed data extraction sheet was created in Microsoft Excel (Table 1). Extracted data focused on study characteristics (i.e., authors, publication date, sample size, country, sampling method, mental health measure, loneliness measurement), sample characteristics (e.g., mean age, sample population) and effect size

(correlational) data. As all included studies reported  $r$ , no effect size conversions were required. Data extraction was completed by the author.

#### **2.4 Risk of Bias Assessment**

Study quality was assessed by the author using the Newcastle - Ottawa quality assessment scale for cross-sectional studies (NOS; Wells et al., 2000). The NOS has been successfully modified for previous reviews of loneliness as a construct (Mozafar Saadati et al., 2021; Tengku Mohd et al., 2019). The NOS is comprised of 3 domains as follows (see Appendix 2):

1. Selection, which is concerned with the validity of the predictor variable (i.e., loneliness) and representativeness of the sample (maximum 4 points).
2. Comparability, which assesses the transparency of sample demographics, confounds and selection criteria (maximum 2 points awarded).
3. Outcome, which evaluates the ascertainment of the outcome variables (anxiety, depression, distress, and suicidal ideation; maximum 3 points).
4. Additionally, a domain representing conflict of interest was added (maximum 2 points) given that reporting bias is often underreported within quality assessment (Sanderson et al., 2007).

#### **2.5 Statistical Analyses**

All analyses were performed in Comprehensive Meta-Analyses (n.d., version 4.0.0). Pearson's correlation coefficient ( $r$ ) served as the primary effect size for this analysis, allowing inferences to be made about the magnitude between loneliness and mental health outcome variables (anxiety, depression, distress, and suicidal ideation). For ease of interpretability and analysis, all  $r$  values were standardized so that a positive  $r$  indicated greater perceived loneliness being associated with worsening mental health. Cohen's (1992) guidelines of small ( $r = .1$ ), medium ( $r = .3$ ), and large ( $r = .5$ ) were used to interpret  $r$ .

Ninety-five percent confidence intervals (CI) and  $p$  values were also calculated for each  $r$  value to determine the precision and statistical significance of each effect size respectively.

The meta-analysis proceeded in several steps. First, a pooled effect size was calculated between loneliness and all mental health outcomes reported across studies. Where a study provided more than one mental health outcome,  $r$  was averaged. Prior to being pooled, each  $r$  was converted to Fisher's  $Z$ , weighted by each study's inverse variance, and then back-transformed to  $r$  (Borenstein et al., 2009).

A one-study removed analysis was then conducted to determine whether the overall pooled  $r$  between loneliness and mental health outcome was characterised by outlier studies. If removing a single study resulted in a significant change in the magnitude of the overall  $r$  or its associated  $p$  value, the study was considered a statistical outlier (Borenstein et al., 2009).

To detect publication bias, a funnel plot – or scatter plot of individual effect sizes for each study - was initially examined. In the absence of publication bias, the distribution of effect sizes should be relatively symmetrical. The Duval and Tweedie (2000) trim and fill method, which imputes missing studies (i.e., effect sizes) required for the funnel plot to be symmetrical, was also run. The amount of asymmetry in the funnel plot was then statistically checked using Egger's (1997) regression test, with a significant value ( $p < .05$ ) indicative of obvious funnel plot asymmetry and the likelihood of publication bias.

Effect sizes were then grouped by each mental health symptom domain (anxiety, depression, distress, suicidal ideation). Between-study heterogeneity was examined with three statistics:  $I^2$  statistic – expressed as a percentage (Higgins, 2003); tau – the estimated standard deviation of underlying effects across studies (Deeks et al., 2022); and prediction intervals – representing the dispersion of true effects in future comparable studies on loneliness and men's mental health (Inthout et al., 2016). A random effects model, which assumes effect

sizes vary across studies due to context specific factors (e.g., study-design, sampling error; Borenstein et al., 2010) was used for these analyses.

## **2.6 Subgroup Analysis and Meta-Regression**

An initial subgroup analysis was used to assess whether between-study differences in measurement of loneliness (i.e., multi- vs. single-item measures) altered the overall effect estimate. A second subgroup analysis was then run to determine whether the overall effect estimate was affected by studies that utilised samples recruited from HeadsUpGuys (Brown et al., 2023; Keum et al., 2021; Ogrodniczuk et al., 2023; Seidler et al., 2022; Sharp et al., 2023); a global psychoeducational resource for men (<https://headsupguys.org/>; Ogrodniczuk et al., 2018). Both subgroup analyses used a mixed effects model, which assumes a fixed effect within groups and random effects between (Borenstein et al., 2010). Finally, a univariate meta-regression was run to determine whether effect size was influenced by a sample's mean age. There were sufficient studies for these analyses (i.e., 4 – 5 studies per subgroup and  $\geq 10$  studies for meta-regression; Deeks et al., 2022).

## Results

### 3.1 Study Screening

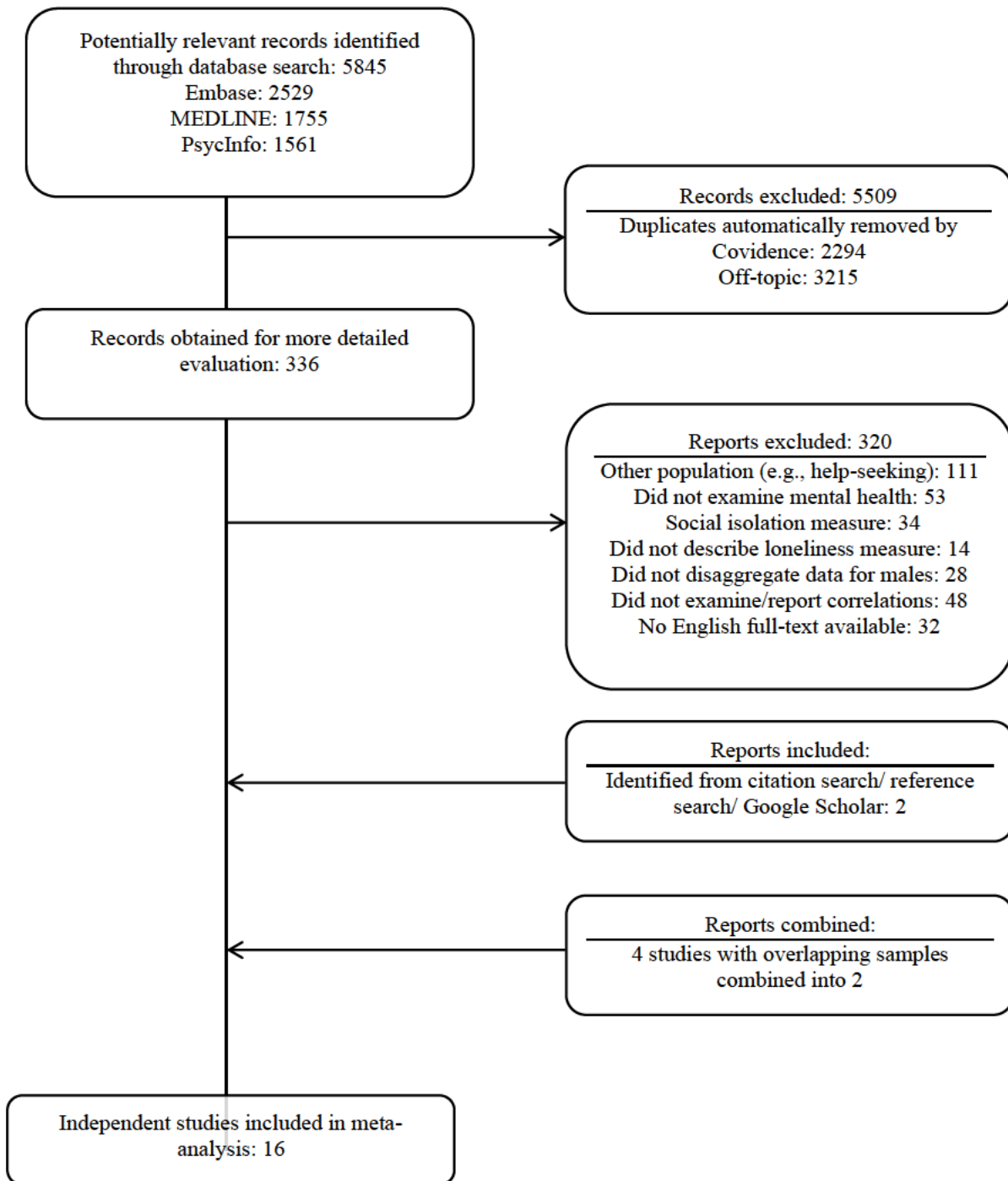
A total of 5845 records were imported into Covidence with 3551 titles and abstracts screened after automatic removal of duplicates. Of these, 336 full-text records were retrieved for re-screening against the eligibility criteria (Figure 1). This process was completed solely by the author. Authors of 11 studies were contacted for additional data for their male sample, with five responding. The remaining six studies were excluded due to insufficient data. This resulted in a final sample of 19 studies that satisfied all selection criteria. Of these, two studies led by Alpass & Neville (2003;2004) and two by Ogrodniczuk et al. (2023) and Sharp et al. (2023) used the same sample, although assessed different mental health outcomes. Whilst all data were considered, these four papers were treated as two independent studies for all analyses (Deeks et al., 2022). A further two studies with overlapping samples were also identified (Cox et al., 2020; Kealy et al., 2021), however only Kealy et al. (2021) was included as it provided more comprehensive mental health data (i.e., data for depression, suicidal ideation, and anxiety). The resulting final sample comprised of 16 independent, observational studies.

### 3.2 Study Characteristics

The 16 included studies encompassed a pooled sample of 22898 male adults ranging in age from 17 to 98 years ( $M = 42.33$   $SD = 10.03$ , see Table 1). Study publication dates ranged from 1991 – 2023, although the majority were published after 2020 ( $N_{\text{studies}} = 12$ ). Sample sizes varied considerably (range = 120 – 15140 participants), with most studies using a non-probability sampling technique to source participants (e.g., convenience sampling, snowball sampling;  $N_{\text{studies}} = 11$ ), and four studies recruiting online via the HeadsUpGuys website. All studies relied on self-report data, primarily multi-item standardised measures

**Figure 1**

*Flowchart of study selection process adapted from PRISMA (Page et al., 2021)*



of loneliness ( $N_{\text{studies}} = 9$ ) such as UCLA (Russel et al., 1980). Single-item measures which examined the subjective experience of loneliness (e.g., “*I feel completely alone?*”; Seidler et al., 2022) were used by seven studies. Mental health outcomes were assessed by 15 well-established measures of depression, anxiety, psychological distress, or suicidal ideation, with eight studies incorporating multiple mental health outcomes.

### 3.3 Reporting Quality of Included Studies

Between-study ratings on each NOS domain are displayed in Figure 2, with individual study ratings provided in Appendix 3. A single study scored the maximum available stars in terms of their sample *selection*, or representativeness (Ernst et al., 2021). Although most included enough participants ( $N > 193$ ) to detect a small correlation ( $r = .2$ , power = .8, alpha = .05; Bujan & Baharum, 2016), only one justified their final sample size with a post-hoc power analysis (Ernst et al., 2021). Scores were also lost in the selection domain due to the use of purposely developed (i.e., single item) measures of loneliness, although studies did justify this choice by reference to a landmark meta-analysis in the field (Pinquart & Sorensen, 2001). Maximum scores were also awarded in *comparability* for all but two studies (Alpass & Neville, 2004; Jackson & Cochran, 1991). Similarly, the use of validated *outcome* measurements (a key criterion for study eligibility) was consistent, with all studies achieving 3 stars out of 4 given the reliance on self-reported data (as opposed to independent assessment or record linkage data). Finally, *reporting* bias was minimised, with most studies providing a clear statement relating to the author’s affiliations and/or funding source.

**Table 1***Study and sample characteristics*

Author (date)	Country	Population	<i>N</i>	Mean age (SD) or range (years)	Sampling method	Response rate	Loneliness measure	Mental health measure(s) <sup>a</sup>
Alpass & Neville (2003; 2004)	New Zealand	Elderly community	217	75.4(4.96)	Non-probability	72.3%	ULS-12	GDS SIQ
Brown et al. (2023) <sup>b</sup>	Canada/UK	HeadsUpGuys	364	39.08(15.34)	Non-probability	NA	Single item	K6
Ernst et al. (2021)	Germany	Population sample	1130	50.5(17)	Random route procedures & Kish (1949) selection	55%	Three item Loneliness Scale	PHQ-4 BSS
Jackson & Cochran (1991)	America	Tertiary students	146	17 - 26	Non-probability	NA	ULS-20	SCL-90
Kealy et al. (2021)	Canada	Population sample	530	47.91(14.51)	Weighted randomization & stratification quotas	NA	Single item	PHQ-8 IAS-3 SBQ-R K6
Keum et al. (2021) <sup>b</sup>	Canada/UK/US/Australia	HeadsUpGuys	1827	37.53(14.14)	Non-probability	NA	Single item	K6
Lutzman et al. (2021)	Israel	Elderly community	198	76.14(8.05)	Non-probability	NA	ULS-20	BSS
Mansour et al. (2021)	Australia	Men approaching fatherhood	283	34.6(1.38)	Non-probability	83%	ULS-8	DASS-21
McQuaid et al. (2021)	Canada	Community sample	140	>18	Non-probability	NA	ULS-8	PHQ-9 GAD-7
Neville et al. (2018)	New Zealand	Elderly community	614	60 - 79	Equal probability random sampling	NA	DJG	SF-12
Ogrodniczuk et al. (2023) & Sharp et al. (2023) <sup>b</sup>	Canada	HeadsUpGuys	434	39.76(14.04)	Non-probability	NA	Single item	PHQ-9 PHQ-4
Phillips (2015)	America	Elderly community	120	77.93(8.34)	Stratification-quotas	NA	ULS-20	BSS
Seidler et al. (2022) <sup>b</sup>	Canada	HeadsUpGuys	979	36(13.11)	Non-probability	NA	Single item	K6
Szuster et al. (2022)	Poland	Community sample	606	28.46(9.17)	Non-probability	NA	Single Item	BDI
Tran et al. (2023)	America	Sexual minority	170	22.6(.6)	Non-probability	NA	ULS-20	BDI BAI
Viertiö et al. (2021)	Finland	Community sample	15140	42.4	Stratified random sampling	53%	Single item	MHI-5

*Note.* *N* = total sample size, <sup>a</sup> measures specific to this review, <sup>b</sup> sample recruited from global website <https://headsupguys.org> Measure abbreviations: BAI – Beck Anxiety Inventory; BDI – Beck Depression Inventory; BSS – Beck Scale for Suicidal Ideation (includes German version); DASS-21 – Depression Anxiety Stress Scales; DJG – De Jong Gierveld Loneliness Scale; GAD-7 – Generalized Anxiety Scale; GDS – The Geriatric Depression Scale (7-item); IAS-3 – Interaction Anxiousness Scale (3-item); K6 – Kessler Psychological Distress Scale; Los Angeles Loneliness Scale (includes revised version and 8-, 12- and 20-item forms); MHI-5 – General Mental Health Scale; PHQ – Patient Health Questionnaire (includes 4- and 8- and 9-item forms); SCL-90 – symptom checklist 90; SBQ-R – Suicidal Behaviour Questionnaire – revised; SF-12 Short Form Health Survey; SIQ – Suicidal Ideation Questionnaire; ULS – University of California.

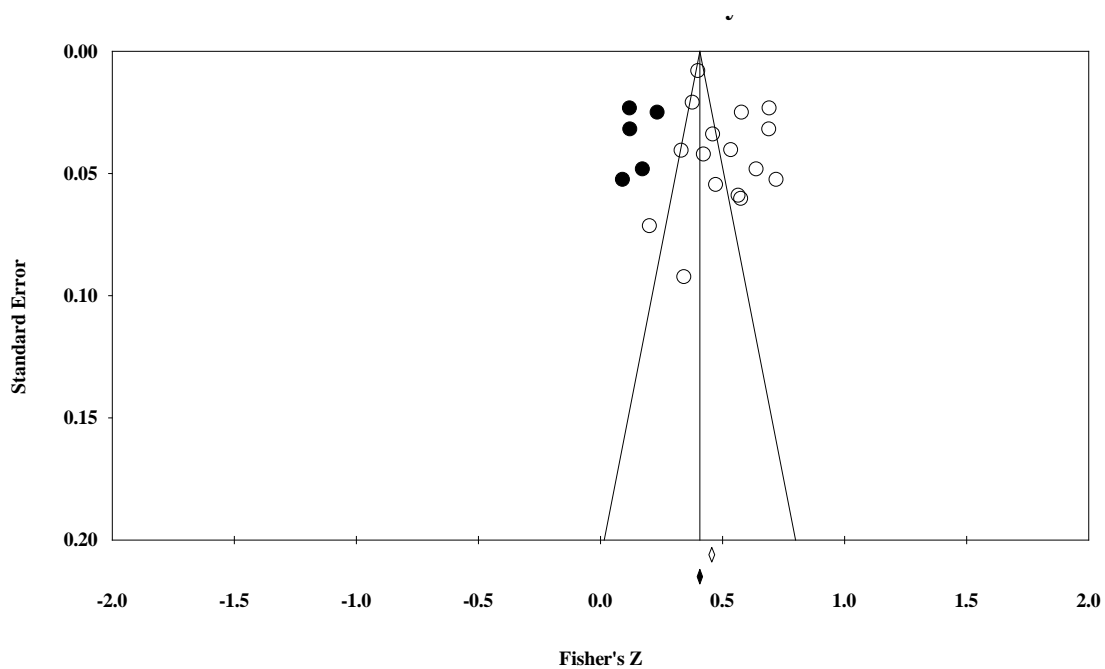
**Figure 2***NOS scoring results*

*Note.* Minimum stars per all domain is 0.

### 3.4 Effect Size Data

#### 3.4.1 Publication Bias and Sensitivity Analysis

Visual inspection of the funnel plot indicated some asymmetry (Figure 3), implying the presence of publication bias. The trim and fill method detected five imputed studies in the upper left quadrant of the funnel plot. However, asymmetric funnel plots may also occur by chance unless a meta-analysis is very large (Simmonds, 2015). This finding was confirmed with the more powerful Egger's regression test, which produced a non-significant finding ( $p = .54$ ), suggesting that the risk of publication bias was unlikely. A one-study removed analysis also confirmed that no single study had a disproportionate influence on the results.

**Figure 3***Funnel Plot of Standard Error by Fisher's Z*

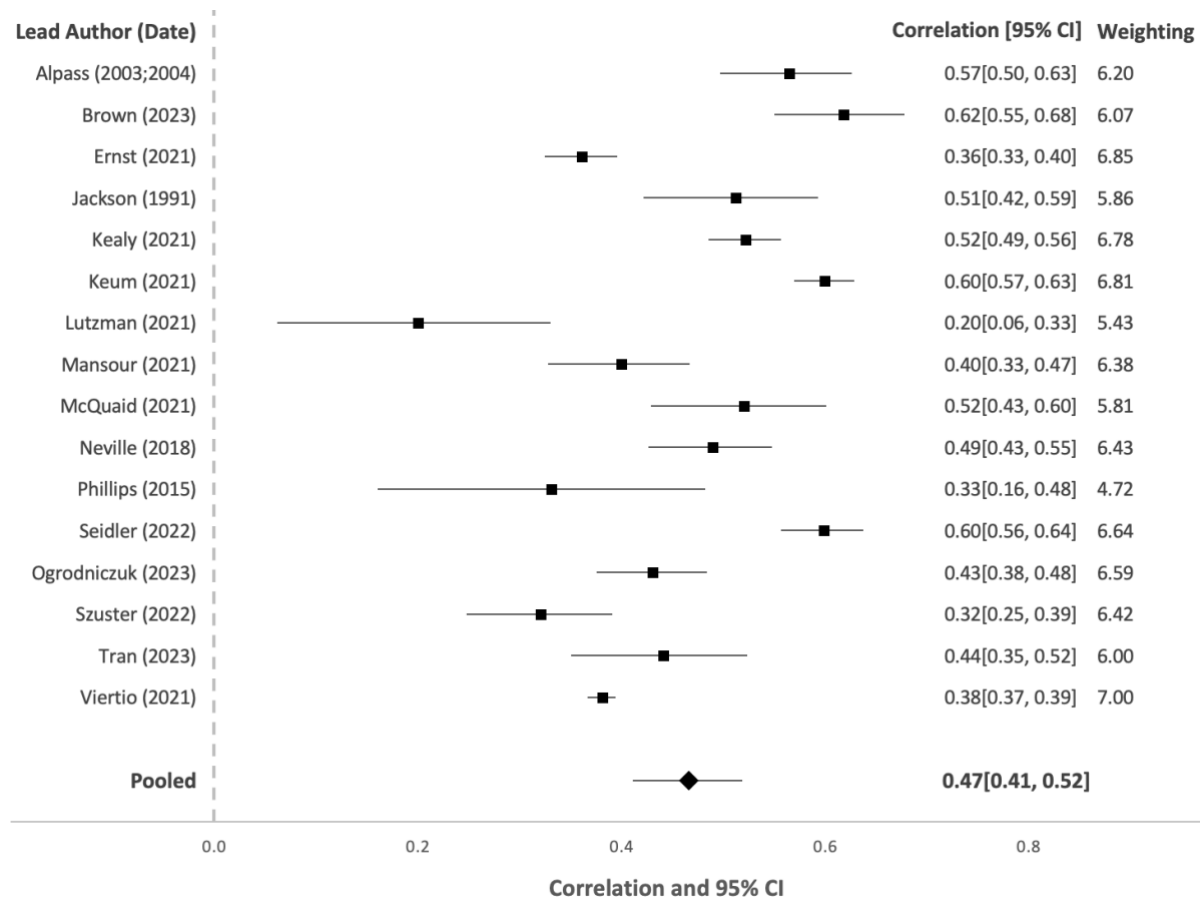
*Note.* White dots represent studies included in the current analysis. Black dots are imputed studies from the Duval and Tweedie (2000) trim and fill method. White marker on the X axis is indicative of pooled effect size of included studies. Black marker on the X axis is indicative of the pooled effect size of included studies adjusted for imputed studies.

### ***3.4.2 Overall Relationship Between Loneliness and Mental Health***

Effect size data for each individual study is graphically illustrated in Figure 4, below. The pooled correlation was moderate and positive ( $r_w = .47$ ); greater loneliness was associated with poor mental health. The prediction interval for this estimate did, however, suggest that the mean effect size among 95% of future comparable studies could fall anywhere between .21 and .66. The wide confidence intervals associated with the smaller  $N$  studies also suggests that some of these estimates may be imprecise.

**Figure 4**

*Forest plot of individual study effect size  $r$  and associated confidence intervals*



*Note.* Ogrodniczuk (2023) refers to the combined findings of Sharp et al. (2023) and Ogrodniczuk et al. (2023).

### 3.4.3 Effect Size by Mental Health Domain

Table 2 lists the pooled effect sizes for each symptom domain (see also Appendix 4 for individual study data grouped by domain). All studies reported positive and significant associations; men who reported a greater degree of loneliness and disconnection from others also endorsed severe symptoms of depression, distress, anxiety, and experienced thoughts of suicide. The heterogeneity statistics, however, suggest substantial variability in these data that sampling error alone cannot account for.

Between-study heterogeneity was seen even among studies using the same measure. For example, Szuster et al. (2022) and Tran et al. (2023) reported  $r = .32$  and  $r = .49$  respectively, based on the original Beck Depression Inventory. Similarly, the Beck Scale for Suicidal Ideation produced correlations of  $r = .2$  (Lutzman et al., 2021) and  $r = .33$  (Phillips, 2015). Conversely, the Kessler Psychological Distress Scale consistently reported higher values ( $r \geq .60$ ; Brown et al., 2023; Keum et al., 2021; Seidler et al., 2022) than other measures of distress. Aside from anxiety, where studies reported relatively consistent results, each domain was characterised by significant heterogeneity. The wide confidence intervals also highlight the potential for imprecise true effect size estimates. Similarly, the prediction intervals suggest that future studies in this area are expected to find a vast range of effects, from small and negligible, to very large and positive  $r$  values.

**Table 2**

*Effect size data grouped by symptom domain*

Domain	$N_{\text{studies}}$	$N_{\text{participants}}$	$r_w$	CI		Between-study heterogeneity			
						Prediction interval		$T$	$I^2$
				L	U	L	U		
Depression	7	2092	.52	.43	.61	.15	.77	.16	86.96
Distress	7	20488	.51	.42	.59	.13	.76	.16	97.43
Anxiety	5	1269	.42	.29	.53	.18	.65	.07	53.86
Suicide Ideation	6	2629	.39	.27	.49	.0005	.39	.13	86.32

*Note.*  $N_{\text{studies}}$  = number of studies providing these data;  $N_{\text{participants}}$  = number of participants from studies providing these data,  $r_w$  = weighted correlation. CI = 95% confidence interval; L/U = lower and upper limits of CI; PI: prediction interval;  $T$  = Tau, estimated standard deviation of underlying true effect across studies;  $I^2$  = proportional estimate of true effect variance.

### 3.5 Subgroup Analyses and Meta-Regression

The potential moderating role of loneliness measurement and recruitment source on the relationship between loneliness and mental health was explored in a series of subgroup analyses (see Table 3). Effect estimates were similar in magnitude, regardless of the measure of loneliness used ( $Q_B(1) = 1.42, p = .23$ ). In comparison, samples recruited from HeadsUpGuys reported larger effect sizes than samples recruited from other sources (e.g., general community;  $Q_B(1) = 7.57, p < .01$ ). A univariate meta-regression determined that individual study estimates were not significantly associated with mean sample age  $Q_{model} = .85(1) p = .36$ . A scatterplot of the regression results is provided in Appendix 5.

**Table 3**

*Effect size estimates grouped by measurement type and sample source*

Subgroup	$N_{studies}$	$N_{participants}$	$r_w$	CI		Between-study heterogeneity		$T$	$I^2$
				L	U	Lower	Upper		
Loneliness measure									
Multi-item	9	3018	.44	.37	.5	.19	.63	.1	85.05
Single-item	7	19880	.5	.41	.59	.12	.76	.16	97.7
Recruitment source									
HeadsUpGuys	4	3604	.57	.48	.64	.09	.83	.11	91.99
Other	12	19394	.43	.38	.48	.24	.58	.09	89.7

*Note.*  $N_{studies}$  = number of studies providing these data;  $N_{participants}$  = number of participants from studies providing these data,  $r_w$  = weighted correlation. CI = 95% confidence interval; L/U = lower and upper limits of CI; PI = prediction interval;  $I^2$  = proportional estimate of true effect variance;  $T$  = Tau, estimated standard deviation of underlying true effect across studies.

## Discussion

The current review is the first, to the author's knowledge, to examine the association between loneliness and mental health outcomes among men. Data from 16 studies, comprising a pooled sample of 22898 adult males from nine countries were meta-analysed and critically evaluated. The findings highlight the mental health risks associated with loneliness – including increased symptoms of anxiety, depression, distress, but also suicidal ideation. Overall conclusions are, however, limited by significant heterogeneity in study methodology and cohorts. Recruitment source was also an issue, with four samples relying on an online database – thereby limiting the generalisability of the findings.

The present findings corroborate those of previous meta-analyses, which identified moderate associations between loneliness and depression ( $r = .5$ , Erzen & Çikrikci, 2018;  $r = .5$ , Park et al., 2020), as well as loneliness and social anxiety in the general population ( $r = .46$ , Maes et al., 2019;  $r = .5$ , Park et al., 2020). Individual studies also identified a moderate to large relationship between male loneliness and distress (Brown et al., 2023; Ernst et al., 2021; Keum et al., 2021; Viertiö et al., 2021); a population that has previously been described as the unexamined norm (Connell et al., 2005). The current study did, however, identify a larger association between loneliness and suicidal ideation ( $r = .39$ ) than that reported by McClelland et al. (2020;  $r = .21$ ), although the latter examined changes over time so only included prospective longitudinal studies. Variability in suicidal ideation is characterized by temporal changes in intensity and duration of self-violent thought as well as affective lability (Witte et al., 2005). Further, suicidal ideation is phenotypically heterogeneous, with substantial differences seen in its presentation that may not be captured, even when operationalised using well-established measures such as the Beck Scale for Suicidal Ideation (Beck et al., 1988; Reeves et al., 2022).

Interestingly, the operationalisation of loneliness, whether as a single item or a

multidimensional construct, did not significantly contribute to the between-study heterogeneity observed in this review. This finding contrasts with previous concerns that measures of loneliness that make direct reference to loneliness by including related words (e.g., “lonely”, “alone”) may underestimate the prevalence of loneliness among men (Gierveld et al., 2018); a group found to be less apt at self-labelling loneliness (Borys & Perlman, 1985; Lau & Gruen, 1992). Indeed, effect estimates were comparable regardless of the type of loneliness measure used. Moreover, of the seven studies that used single-item measures, four recruited samples from a help-seeking population, HeadsUpGuys (Brown et al., 2023; Keum et al., 2021; Ogrodniczuk et al., 2023; Seidler et al., 2022; Sharp et al., 2023), with all using some version of the word “lonely” (e.g., “alone”; Seidler et al., 2022).

Associations between loneliness and combined mental health outcomes were, however, stronger ( $r > .5$ ) among samples recruited from HeadsUpGuys than community or undergraduate student samples. All four studies recruiting from HeadsUpGuys acknowledged their methodology as a potential limitation, citing that the majority of their sample experienced noteworthy psychological distress (Brown et al., 2023; Keum et al., 2021; Ogrodniczuk et al., 2023; Seidler et al., 2022; Sharp et al., 2023). These findings highlight the problems associated with online recruitment methods which, although seen as a low-cost and wide-reaching tool, can introduce a selection bias and limit the validity and generalisability of findings (Khazaal et al., 2014). The quality ratings across the included studies in this review certainly suggest potential selection bias, with a majority using non-probability sampling methods (i.e., convenience samples), limited justification of sample sizes, and providing limited information regarding response rates. More attention needs to be paid to these recruitment factors in future men’s health research.

The present findings also demonstrated that loneliness was a consistent risk factor for men, regardless of age. This finding certainly adds more weight behind an earlier meta-

analysis which examined the influence of loneliness among older adults (Pinquart & Sorensen, 2001). Loneliness is often stereotyped as being synonymous with old age given social network interruptions often associated with ageing - including retirement, spousal loss, divorce, and health decline (Alpass & Neville, 2003; Heylen et al., 2010). Indeed, divorce and loss of a partner appear to have been suggested to have worse psychosocial outcomes for men than women (Felix et al., 2013). The stability of loneliness across the lifespan may also reflect changing social needs as individuals age. For example, research has suggested that reductions in social networks through aging are not due to passive age-related factors but rather are actively sought out due to changing social needs, whereas younger men have different requirements of social relationships, desiring diverse relationships and larger social networks (Wrzus et al., 2013). This difference in both size and makeup of social network preference could suggest that loneliness may have different origins across the lifespan, insofar as loneliness is viewed as the discrepancy between perceived and desired social connections. Nonetheless, the findings indicate that experiencing loneliness is equally detrimental for male mental health outcomes throughout the adult lifespan.

#### **4.1 Clinical Implications**

The findings implicate loneliness as a substantial risk factor for men's mental health that can be routinely assessed in research or practice using validated single- or multi-item tools. The employment of single-item measures may certainly be advantageous when researchers want to employ a unidimensional global measure of loneliness considering that smaller survey lengths have the potential to increase participant engagement (Galesic & Bosnjak, 2009; Guin et al., 2012).

Loneliness is also a potential target for mental health intervention. That said, poor utilisation of mental health services represents a significant obstacle for male health (Seidler et al., 2018a). The lack of male engagement in male health services is a complex topic, a full

description of which exceeds the capacity of this paper. However, there is suggestion that this lack of engagement is at least partially due to a male perception that mental health services are oriented towards women's needs (Ogrodniczuk et al., 2016). Gendered approaches to mental health services have garnered increasing attention due to recent research suggesting that they may increase engagement, retention, and positively influence mental health outcomes for men (e.g., Johnson et al., 2012; Seidler et al., 2018a; Seidler et al., 2018b). Accordingly, male-specific interventions of loneliness have shown to have significant positive mental health outcomes for older men (e.g., Men's Sheds; Milligan et al., 2016). Conceptually, similar programs have shown efficacy for First Nation's men in British Columbia, demonstrating at least some adaptability for differing cultural needs (Gross et al., 2016; Gross et al., 2023). These types of interventions are appealing, providing an avenue to deliver preventative interventions by targeting loneliness through addressing men's needs for social support and community (Ogrodniczuk, et al., 2016). Importantly, the increased social connectedness (and decreased loneliness) resulting from involvement in such programs have shown to not only be useful as a preventative intervention of depression, but also beneficial for reducing extant depressive symptoms (Cruwys et al., 2013). However, such programs have often focused on older men. The findings of this review indicate the potential need for such preventative interventions to be adapted to young men as well. Given there are many types of loneliness interventions with different conceptual underpinnings (Masi et al., 2011) it is crucial that young men are involved in the design and implementation of such programs. This concept of co-design may increase the likelihood that such services are delivered effectively with desired treatment outcomes being achieved (Ellis et al., 2014).

#### **4.2 Future Research and Methodological Limitations**

The current meta-analysis had several limitations which should be acknowledged. Firstly, the findings potentially homogenise the experiences of men and masculinity. While

this review is an important first step in understanding the experiences of loneliness among men, specifically (Brooks, 2010; Gierveld et al., 2018; Ratcliffe et al., 2023), maintaining a view of men and masculinity as a singular monolith could, arguably, pathologize traditional masculine norms and reduce understanding of men's health behaviours (Seidler et al., 2018b). While there is considerable discussion around the role of masculinity within men's health research (Englar-Carlson, 2013), men's experiences and understandings of masculinity are varying and potentially context driven (Anderson & McCormack, 2018; Seidler et al., 2018a). Recent qualitative studies that have explored men's perspectives of loneliness, mental health, and masculinities confirm their varied experiences (e.g., Ratcliffe et al., 2023; Sharp et al., 2022; Wills & Vickery, 2022). Future research should aim to extend these qualitative understandings of men's health, loneliness, and masculinities to male targeted loneliness interventions. This might be achieved by examining how men's adherence (or non-adherence) to specific masculine norms (or differing profiles of masculinity) interact with engagement in and outcomes of loneliness interventions. Given that research suggests conformity to masculine norms may vary across the lifespan (Herreen et al., 2021; Rice et al., 2016), this may be particularly informative in adapting loneliness interventions to the potentially differing needs of men.

An additional limitation may derive from the author's decision to not convert beta-coefficients to  $r$ , given the potential for inaccurate estimates (Hunter & Schmidt, 1990; Peterson & Brown, 2005). Resultingly, 48 potential studies were excluded from the meta-analysis, which may have introduced a non-sampling error, whereby all the available effect size data was not included within the current analysis. Moreover, 28 studies that did not disaggregate data for males in the sample were excluded. Future studies should endeavour to report correlational and disaggregate data for sample parameters, such as gender, consistent with recommended reporting guidelines for observational studies (e.g., Von Elm et al., 2007).

Considering men are often underrepresented in health research (Ellis et al., 2014; Patel, 2003; Ryan et al., 2019), doing so has the potential to contribute valuable data for men's health research.

Although the current analysis was based on an extensive literature search, only outcomes of anxiety, depression, distress, and suicidal ideation were considered; outcomes which were commonly reported across included studies. Previous meta-analytic evidence indicates that loneliness negatively impacts a broad range of health outcomes - including well-being, physical-health, sleep, and all-cause mortality (Park et al., 2020; Rico-Uribe et al., 2018). Future research should seek to investigate whether, and to what extent, these findings extend to adult men.

#### **4.3 Conclusion**

Loneliness is associated with poorer mental health outcomes for adult men. That is, as loneliness increases so too do symptoms of anxiety, depression, distress, and suicidal ideation. The data presented here indicate that this association is independent of loneliness measurement type and age - but significantly influenced by recruitment strategies. The pooled findings highlight the importance of identifying and targeting loneliness to help prevent and reduce mental health issues among men across the lifespan. Future research can extend the current findings by considering a more diverse group of men and assessing how their conceptualisation of masculinity interacts with the mental health domains assessed in the current meta-analysis.

### References

References marked with an asterisk indicate studies included in the meta-analysis.

- Addis, M. E., & Mahalik, J. R. (2003). Men, masculinity, and the contexts of help seeking. *American Psychologist*, 58(1), 5–14. <https://doi.org/10.1037/0003-066X.58.1.5>
- Addis, M. E., Mansfield, A., & Syzdek, M. (2010). Is “masculinity” a problem?: Framing the effects of gendered social learning in men. *Psychology of Men & Masculinity*, 11(2), 77-90. <https://doi.org/10.1037/a0018602>
- \*Alpass, F. M., & Neville, S. (2003). Loneliness, health and depression in older males. *Aging & Mental Health*, 7(3), 212–216. <https://doi.org/10.1080/1360786031000101193>
- \*Alpass, F. M., & Neville, S. (2004). Suicidal Ideation in Older New Zealand Males (1991-2000). *International Journal of Men's Health*, 4(3), 277–285. <http://dx.doi.org/10.3149/jmh.0403.277>
- Amichai-Hamburger, Y., & Ben-Artzi, E. (2003). Loneliness and Internet use. *Computers in Human Behavior*, 19(1), 71–80. [https://doi.org/10.1016/S0747-5632\(02\)00014-6](https://doi.org/10.1016/S0747-5632(02)00014-6)
- Anderson, E., & McCormack, M. (2018). Inclusive Masculinity Theory: overview, reflection and refinement. *Journal of Gender Studies*, 27(5), 547–561. <https://doi.org/10.1080/09589236.2016.1245605>
- Antonucci, T. C., & Akiyama, H. (1987). An examination of sex differences in social support among older men and women. *Sex Roles: A Journal of Research*, 17(11-12), 737–749. <https://doi.org/10.1007/BF00287685>
- Australian Bureau of Statistics. (2021). *Causes of Death, Australia*. ABS. <https://www.abs.gov.au/statistics/health/causes-death/causes-death-australia/latest-release>.

Barreto, M., Victor, C., Hammond, C., Eccles, A., Richins, M. T., & Qualter, P. (2021).

Loneliness around the world: Age, gender, and cultural differences in loneliness.

*Personality and Individual Differences*, 169, Article 110066.

<https://doi.org/10.1016/j.paid.2020.110066>

Beck, A. T., Steer, R. A., & Ranieri, W. F. (1988). Scale for suicide ideation: Psychometric properties of a self-report version. *Journal of Clinical Psychology*, 44(4), 499–505.

[https://doi.org/10.1002/1097-4679\(198807\)44:4<499::AID-](https://doi.org/10.1002/1097-4679(198807)44:4<499::AID-)

[JCLP2270440404>3.0.CO;2-6](https://doi.org/10.1002/1097-4679(198807)44:4<499::AID-JCLP2270440404>3.0.CO;2-6)

Bem, S. L. (1974). The measurement of psychological androgyny. *Journal of Consulting and*

*Clinical Psychology*, 42(2), 155–162. <https://doi.org/10.1037/h0036215>

Beutel, M. E., Klein, E. M., Brähler, E., Reiner, I., Jünger, C., Michal, M., Wiltink, J., Wild, P. S., Münzel, T., Lackner, K. J., & Tibubos, A. N. (2017). Loneliness in the general

population: prevalence, determinants and relations to mental health. *BMC Psychiatry*,

17(1), Article 97. <https://doi.org/10.1186/s12888-017-1262-x>

Blank, G., & Lutz, C. (2017). Representativeness of Social Media in Great Britain:

Investigating Facebook, LinkedIn, Twitter, Pinterest, Google+, and

Instagram. *American Behavioral Scientist*, 61(7), 741–756.

<https://doi.org/10.1177/0002764217717559>

Blazina, C., Eddins, R., Burrige, A., & Settle, A. G. (2007). The Relationship between

Masculinity Ideology, Loneliness, and Separation-Individuation Difficulties. *The*

*Journal of Men's Studies*, 15(1), 101–109. <https://doi.org/10.3149/jms.1501.101>

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

- Borenstein, M., Hedges, L. V., Higgins, J. P. T., & Rothstein, H. R. (2010). A basic introduction to fixed-effect and random-effects models for meta-analysis. *Research Synthesis Methods, 1*(2), 97–111. <https://doi.org/10.1002/jrsm.12>
- Borys, S., & Perlman, D. (1985). Gender Differences in Loneliness. *Personality and Social Psychology Bulletin, 11*(1), 63–74. <https://doi.org/10.1177/0146167285111006>
- Bramer, W. M., Rethlefsen, M. L., Kleijnen, J., & Franco, O. H. (2017). Optimal database combinations for literature searches in systematic reviews: a prospective exploratory study. *Systematic Reviews, 6*(1). <https://doi.org/10.1186/s13643-017-0644-y>
- Brooks, G. R. (2010). Despite problems, “masculinity” is a vital construct. *Psychology of Men & Masculinity, 11*(2), 107–108. <https://doi.org/10.1037/a0019180>
- \*Brown, T. L., Oliffe, J. L., Kealy, D., Rice, S. M., Seidler, Z. E., & Ogradniczuk, J. S. (2023). The influence of meaning in life on psychological distress among men: A serial multiple mediation model involving resilience and loneliness. *Current Research in Behavioral Sciences, 4*, Article 100114. <https://doi.org/https://doi.org/10.1016/j.crbeha.2023.100114>
- Bryant-Bedell, K., & Waite, R. (2010). Understanding major depressive disorder among middle-aged African American men. *Journal of Advanced Nursing, 2050-2060*. <https://doi.org/10.1111/j.1365-2648.2010.05345.x>
- Buchanan, T., & Smith, J. L. (1999). Using the Internet for psychological research: Personality testing on the World Wide Web. *British Journal of Psychology, 90*(1), 125–144. <https://doi.org/10.1348/000712699161189>
- Bujang, M. A., & Baharum, N. (2016). Sample Size Guideline for Correlation Analysis. *World Journal of Social Science Research, 3*(1), 37–46. <https://doi.org/10.22158/wjssr.v3n1p37>

- Cacioppo, J. T., & Cacioppo, S. (2018). The growing problem of loneliness. *The Lancet*, 391(10119), 426. [https://doi.org/10.1016/s0140-6736\(18\)30142-9](https://doi.org/10.1016/s0140-6736(18)30142-9)
- Cacioppo, J.T., & Hawkley, L.C. (2003). Social Isolation and Health, with an Emphasis on Underlying Mechanisms. *Perspectives in Biology and Medicine* 46(3), S39-S52. <https://doi.org/10.1353/pbm.2003.0063>.
- Cacioppo, J. T., Hawkley, L. C., Norman, G. J., & Berntson, G. G. (2011). Social isolation. *Annals of the New York Academy of Sciences*, 1231(1), 17–22. <https://doi.org/10.1111/j.1749-6632.2011.06028.x>
- Centers for Disease Control. (2023, August). *Suicide Data and Statistics*. U.S. Department of Health and Human Services, National Center for Injury Prevention and Control. <https://www.cdc.gov/suicide/suicide-data-statistics.html>
- Cohen, J. (1992). Statistical Power Analysis. *Current Directions in Psychological Science*, 1(3), 98–101. <https://doi.org/10.1111/1467-8721.ep10768783>
- Connell, R. W., Hearn, J. & Kimmel, M. S. (2005). Introduction. In Kimmel, M. S., Hearn, J. & Connell, R. W. (Eds). *Handbook of studies on Men & Masculinities*. (1st ed. pp. 1 – 13). Sage Publications.
- Courtenay, W. H. (2003). Key Determinants of the Health and Well-Being of Men and Boys. *International Journal of Men's Health*, 2(1), 1–30. <https://doi.org/10.3149/jmh.0201.1>
- Cox, D. W., Ogrodniczuk, J. S., Oliffe, J. L., Kealy, D., Rice, S. M., & Kahn, J. H. (2020). Distress Concealment and Depression Symptoms in a National Sample of Canadian Men: Feeling Understood and Loneliness as Sequential Mediators. *The Journal of Nervous and Mental Disease*, 208(6). [https://journals.lww.com/jonmd/fulltext/2020/06000/distress\\_concealment\\_and\\_depression\\_symptoms\\_in\\_a.12.aspx](https://journals.lww.com/jonmd/fulltext/2020/06000/distress_concealment_and_depression_symptoms_in_a.12.aspx)

- Cramer, K. M., & Neyedley, K. A. (1998). Sex differences in loneliness: The role of masculinity and femininity. *Sex Roles: A Journal of Research*, 38(7-8), 645–653.  
<https://doi.org/10.1023/A:1018850711372>
- Cruwys, T., Dingle, G. A., Haslam, C., Haslam, S. A., Jetten, J., & Morton, T. A. (2013). Social group memberships protect against future depression, alleviate depression symptoms and prevent depression relapse. *Social Science & Medicine*, 98, 179-186.  
<https://doi.org/10.1016/j.socscimed.2013.09.013>
- Dahlberg, L. (2021). Loneliness during the COVID-19 pandemic. *Aging & Mental Health*, 25(7), 1161–1164. <https://doi.org/10.1080/13607863.2021.1875195>
- Deeks J. J., Higgins J. P. T., & Altman D. G. (2022). Chapter 10: Analysing data and undertaking meta-analyses. In: J. P. T. Higgins, J. Thomas, J. Chandler, M. Cumpston, T. Li, M. J. Page, & V. A. Welch (Eds), *Cochrane Handbook for Systematic Reviews of Interventions version 6.3 (updated February 2022)*. Cochrane. [www.training.cochrane.org/handbook](http://www.training.cochrane.org/handbook).
- Downes-Le Guin, T., Baker, R., Mechling, J., & Ruyle, E. (2012). Myths and realities of respondent engagement in online surveys. *International Journal of Market Research*, 54(5), 613–633. <https://doi.org/10.2501/IJMR-54-5-613-633>
- Duval, S., & Tweedie, R. (2000). Trim and Fill: A Simple Funnel-Plot-Based Method of Testing and Adjusting for Publication Bias in Meta-Analysis. *Biometrics*, 56(2), 455–463. <https://doi.org/10.1111/j.0006-341x.2000.00455.x>
- Dykstra, P. A. (2009). Older adult loneliness: myths and realities. *European Journal of Ageing*, 6(2), 91–100. <https://doi.org/10.1007/s10433-009-0110-3>

- Egger, M., Smith, G. D., Schneider, M., & Minder, C. (1997). Bias in meta-analysis detected by a simple, graphical test. *BMJ*, *315*(7109), 629–634.  
<https://doi.org/10.1136/bmj.315.7109.629>
- Ellis, L. A., McCabe, K. L., Rahilly, K. A., Nicholas, M. A., Davenport, T. A., Burns, J. M., & Hickie, I. B. (2014). Encouraging young men's participation in mental health research and treatment: perspectives in our technological age. *Clinical investigation*, *4*(10), 881–888. <https://doi.org/10.4155/cli.14.61>
- Englar-Carlson, M., & Kiselica, M. S. (2013). Affirming the Strengths in Men: A Positive Masculinity Approach to Assisting Male Clients. *Journal of Counseling & Development*, *91*(4), 399–409. <https://doi.org/10.1002/j.1556-6676.2013.00111.x>
- \*Ernst, M., Klein, E. M., Beutel, M. E., & Brähler, E. (2021). Gender-specific associations of loneliness and suicidal ideation in a representative population sample: Young, lonely men are particularly at risk. *Journal of Affective Disorders*, *294*, 63–70.  
<https://doi.org/10.1016/j.jad.2021.06.085>
- Erzen, E., & Çikrikci, Ö. (2018). The effect of loneliness on depression: A meta-analysis. *International Journal of Social Psychiatry*, *64*(5), 427–435.  
<https://doi.org/10.1177/0020764018776349>
- Eysenbach, G., & Wyatt, J. (2002). Using the Internet for Surveys and Health Research. *Journal of Medical Internet Research*, *4*(2), e13.  
<https://doi.org/10.2196/jmir.4.2.e13>
- Felix, D. S., Robinson, W. D., & Jarzynka, K. J. (2013). The Influence of Divorce on Men's Health. *Journal of Men's Health*, *10*(1), 3–7.  
<https://doi.org/10.1016/j.jomh.2012.09.002>
- Flood, M. (2005). *Mapping loneliness in Australia* [Report]. The Australia Institute.  
<https://apo.org.au/node/734>

- Fortson, B. L., Scotti, J. R., Ben, K. S. D., & Chen, Y.-C. (2006). Reliability and validity of an Internet traumatic stress survey with a college student sample. *Journal of Traumatic Stress, 19*(5), 709–720. <https://doi.org/10.1002/jts.20165>
- Fuhrer, R., & Stansfeld, S. A. (2002). How gender affects patterns of social relations and their impact on health: a comparison of one or multiple sources of support from “close persons”. *Social Science & Medicine, 54*(5), 811–825.  
[https://doi.org/10.1016/S0277-9536\(01\)00111-3](https://doi.org/10.1016/S0277-9536(01)00111-3)
- Furey, E. (2022, January 24). *Random number Generator*. CalculatorSoup.  
<https://www.calculatorsoup.com/calculators/statistics/random-number-generator.php>
- Hammond C (2018) *Who Feels Lonely? The Results of the World's Largest Loneliness Study*. BBC Radio 4.  
<https://www.bbc.co.uk/programmes/articles/2yzhfv4DvqVp5nZyxBD8G23/who-feels-lonelythe-results-of-the-world-s-largest-loneliness-study>.
- Herreen, D., Rice, S., Currier, D., Schlichthorst, M., & Zajac, I. (2021). Associations between conformity to masculine norms and depression: age effects from a population study of Australian men. *BMC Psychology, 9*(1). <https://doi.org/10.1186/s40359-021-00533-6>
- Heylen, L. (2010). The older, the lonelier? Risk factors for social loneliness in old age. *Ageing & Society, 30*(7), 1177–1196.  
<https://doi.org/10.1017/S0144686X10000292>
- Galesic, M., & Bosnjak, M. (2009). Effects of Questionnaire Length on Participation and Indicators of Response Quality in a Web Survey. *Public Opinion Quarterly, 73*(2), 349-360. <https://doi.org/10.1093/poq/nfp031>

- Gierveld, J. d. J., & Kamphuis, F. (1985). The development of a Rasch-type loneliness scale. *Applied Psychological Measurement*, 9(3), 289–299.  
<https://doi.org/10.1177/014662168500900307>
- Gierveld, J. d. J., Van Tilburg, T. G., & Dykstra, P. A. (2018). New ways of theorizing and conducting research in the field of loneliness and social isolation. In A. L. Vangelisti & D. Perlman (Eds.), *The Cambridge handbook of personal relationships* (pp. 391–404). Cambridge University Press. <https://doi.org/10.1017/9781316417867.031>
- Goodell, S., Druss, B. G., & Walker, E. R. (2011). *Mental disorders and medical comorbidity*. Robert Wood Johnson Foundation.  
<https://www.civitasforhealth.org/wp-content/uploads/2022/08/rwjf69438.pdf>
- Gosling, S. D., Vazire, S., Srivastava, S., & John, O. P. (2004). Should We Trust Web-Based Studies? A Comparative Analysis of Six Preconceptions About Internet Questionnaires. *American Psychologist*, 59(2), 93–104. <https://doi.org/10.1037/0003-066X.59.2.93>
- Gross, P. A., Efimoff, I. H., Josewski, V., Cohn, F., Lambert, S., Everstz, T., & Oliffe, J. (2023). “Where Are Our Men?”: How the DUDES Club Has Supported Indigenous Men in British Columbia, Canada to Seek a Path of Healing and Wellness. In J. A. Smith, D. C. Watkins, & D. M. Griffith (Eds.), *Health Promotion with Adolescent Boys and Young Men of Colour: Global Strategies for Advancing Research, Policy, and Practice in Context* (pp. 91-104). Springer International Publishing.  
[https://doi.org/10.1007/978-3-031-22174-3\\_6](https://doi.org/10.1007/978-3-031-22174-3_6)
- Gross, P. A., Efimoff, I., Patrick, L., Josewski, V., Hau, K., Lambert, S., & Smye, V. (2016). The DUDES Club: A brotherhood for men’s health. *Canadian Family Physician*, 62(6), e311–e318. <http://www.cfp.ca/content/62/6/e311.abstract>

- Higgins, J. P. T. (2003). Measuring inconsistency in meta-analyses. *BMJ*, 327(7414), 557–560. <https://doi.org/10.1136/bmj.327.7414.557>
- Horsley, T., Dingwall, O., & Sampson, M. (2011). Checking reference lists to find additional studies for systematic reviews. *The Cochrane database of systematic reviews*, 2011(8), Article MR000026. <https://doi.org/10.1002/14651858.MR000026.pub2>
- Hunter, J. E., & Schmidt, F. L. (1990). *Methods of meta-analysis: Correcting error and bias in research findings*. Sage Publications, Inc.
- Inthout, J., Ioannidis, J. P. A., Rovers, M. M., & Goeman, J. J. (2016). Plea for routinely presenting prediction intervals in meta-analysis. *BMJ Open*, 6(7), Article e010247. <https://doi.org/10.1136/bmjopen-2015-010247>
- \*Jackson, J., & Cochran, S. D. (1991). Loneliness and psychological distress. *The Journal of Psychology: Interdisciplinary and Applied*, 125(3), 257-262. <https://doi.org/10.1080/00223980.1991.10543289>
- Johnson, J. L., Oliffe, J. L., Kelly, M. T., Galdas, P., & Ogrodniczuk, J. S. (2012). Men's discourses of help-seeking in the context of depression. *Sociology of Health & Illness*, 34(3), 345–361. <https://doi.org/10.1111/j.1467-9566.2011.01372.x>
- Kaźmierczak, I., Zajenkowska, A., Rogoza, R., Jonason, P. K., & Ścigala, D. (2023). Self-selection biases in psychological studies: Personality and affective disorders are prevalent among participants. *PLOS ONE*, 18(3), Article e0281046. <https://doi.org/10.1371/journal.pone.0281046>
- \*Kealy, D., Rice, S. M., Seidler, Z. E., Ogrodniczuk, J. S., & Oliffe, J. L. (2023). Social anxiety and suicidality among men: examining the effects of loneliness and childhood trauma. *Current Psychology*, 42(11), 8709–8712. <https://doi.org/10.1007/s12144-021-02235-z>

- \*Keum, B. T., Oliffe, J. L., Rice, S. M., Kealy, D., Seidler, Z. E., Cox, D. W., Levant, R. F., & Ogrodniczuk, J. S. (2023). Distress disclosure and psychological Distress among men: the role of feeling understood and loneliness. *Current Psychology*, 42(13), 10533–10542. <https://doi.org/10.1007/s12144-021-02163-y>
- Kraut, R., Patterson, M., Lundmark, V., Kiesler, S., Mukophadhyay, T., & Scherlis, W. (1998). Internet paradox: A social technology that reduces social involvement and psychological well-being? *American Psychologist*, 53(9), 1017–1031. <https://doi.org/10.1037/0003-066X.53.9.1017>
- Lau, S., & Gruen, G. E. (1992). The Social Stigma of Loneliness: Effect of Target Person's and Perceiver's Sex. *Personality and Social Psychology Bulletin*, 18(2), 182–189. <https://doi.org/10.1177/0146167292182009>
- Liebler, C. A., & Sandefur, G. D. (2002). Gender differences in the exchange of social support with friends, neighbors, and co-workers at midlife. *Social Science Research*, 31(3), 364-391. [https://doi.org/https://doi.org/10.1016/S0049-089X\(02\)00006-6](https://doi.org/https://doi.org/10.1016/S0049-089X(02)00006-6)
- Litwin, H. (1997). Support Network Type and Health Service Utilization. *Research on Aging*, 19(3), 274–299. <https://doi.org/10.1177/0164027597193002>
- \*Lutzman, M., Sommerfeld, E., & Ben-David, S. (2021). Loneliness and social integration as mediators between physical pain and suicidal ideation among elderly men. *International Psychogeriatrics*, 33(5), 453–459. <https://doi.org/10.1017/s104161022000112x>
- Maes, M., Qualter, P., Vanhalst, J., Van Den Noortgate, W., & Goossens, L. (2019). Gender Differences in Loneliness across the Lifespan: A Meta–Analysis. *European Journal of Personality*, 33(6), 642–654. <https://doi.org/10.1002/per.2220>

- \*Mansour, K. A., Greenwood, C. J., Biden, E. J., Francis, L. M., Olsson, C. A., & Macdonald, J. A. (2021). Pre-pandemic Predictors of Loneliness in Adult Men During COVID-19. *Frontiers in Psychiatry*, 12, Article 775588 <https://doi.org/10.3389/fpsy.2021.775588>
- Masi, C. M., Chen, H.-Y., Hawkley, L. C., & Cacioppo, J. T. (2011). A Meta-Analysis of Interventions to Reduce Loneliness. *Personality and Social Psychology Review*, 15(3), 219–266. <https://doi.org/10.1177/1088868310377394>
- McClelland, H., Evans, J. J., Nowland, R., Ferguson, E., & O'Connor, R. C. (2020). Loneliness as a predictor of suicidal ideation and behaviour: A systematic review and meta-analysis of prospective studies. *Journal of Affective Disorders*, 274, 880–896. <https://doi.org/10.1016/j.jad.2020.05.004>
- McKenzie, S. K., Collings, S., Jenkin, G., & River, J. (2018). Masculinity, Social Connectedness, and Mental Health: Men's Diverse Patterns of Practice. *American Journal of Men's Health*, 12(5), 1247–1261. <https://doi.org/10.1177/1557988318772732>
- McIntyre, J. C., Worsley, J., Corcoran, R., Harrison Woods, P., & Bentall, R. P. (2018). Academic and non-academic predictors of student psychological distress: the role of social identity and loneliness. *Journal of Mental Health*, 27(3), 230–239. <https://doi.org/10.1080/09638237.2018.1437608>
- \*McQuaid, R. J., Cox, S. M. L., Ogunlana, A., & Jaworska, N. (2021). The burden of loneliness: Implications of the social determinants of health during COVID-19. *Psychiatry Research*, 296, Article 113648. <https://doi.org/10.1016/j.psychres.2020.113648>

- Mental Health Coordinating Council. (2021). Children and young people with mental health conditions. *The Mental Health Rights Manual: A Guide to the Legal and Human Rights of People Navigating the Mental Health, Legal and Human Service System in NSW*, 5th Edition, MHCC, Sydney, Australia. <http://mhrm.mhcc.org.au>
- Milligan, C., Neary, D., Payne, S., Hanratty, B., Irwin, P., & Dowrick, C. (2016). Older men and social activity: A scoping review of Men's Sheds and other gendered interventions. *Ageing & Society*, 36(5), 895–923. <https://doi.org/10.1017/S0144686X14001524>
- Mozafar Saadati, H., Mirzaei, H., Okhovat, B., & Khodamoradi, F. (2021). Association between internet addiction and loneliness across the world: A meta-analysis and systematic review. *SSM - Population Health*, 16, Article 100948. <https://doi.org/10.1016/j.ssmph.2021.100948>
- \*Neville, S., Adams, J., Montayre, J., Larmer, P., Garrett, N., Stephens, C., & Alpass, F. (2018). Loneliness in Men 60 Years and Over: The Association With Purpose in Life. *American Journal of Men's Health*, 12(4), 730–739. <https://doi.org/10.1177/1557988318758807>
- Ogrodniczuk, J., Oliffe, J., & Beharry, J. (2018). HeadsUpGuys: Canadian online resource for men with depression. *Canadian Family Physician*, 64(2), 93–95. <http://www.cfp.ca/content/64/2/93.abstract>
- Ogrodniczuk, J., Oliffe, J., Kuhl, D., & Gross, A. P. (2016). Men's mental health. *Canadian Family Physician*, 62(6), 463–464. <http://www.cfp.ca/content/62/6/463.abstract>
- \*Ogrodniczuk, J. S., Sivagurunathan, M., Kealy, D., Rice, S. M., Seidler, Z. E., & Oliffe, J. L. (2023). Suicidal ideation among men during COVID-19: Examining the roles of loneliness, thwarted belongingness, and personality impairment. *Scandinavian Journal of Psychology*, 64(4), 401–408. <https://doi.org/10.1111/sjop.12904>

- Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E., McDonald, S., . . . Moher, D. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *International Journal of Surgery*, 88, Article 105906. <https://doi.org/10.1016/j.ijssu.2021.105906>
- Park, C., Majeed, A., Gill, H., Tamura, J., Ho, R. C., Mansur, R. B., Nasri, F., Lee, Y., Rosenblat, J. D., Wong, E., & McIntyre, R. S. (2020). The Effect of Loneliness on Distinct Health Outcomes: A Comprehensive Review and Meta-Analysis. *Psychiatry Research*, 294, Article 113514. <https://doi.org/https://doi.org/10.1016/j.psychres.2020.113514>
- Patel, M. X., Doku, V., & Tennakoon, L. (2003). Challenges in recruitment of research participants. *Advances in Psychiatric Treatment*, 9(3), 229–238. <https://doi.org/10.1192/apt.9.3.229>
- Paul, C., Ayis, S., & Ebrahim, S. (2006). Psychological distress, loneliness and disability in old age. *Psychology, Health & Medicine*, 11(2), 221–232. <https://doi.org/10.1080/13548500500262945>
- Perissinotto, C. M., Stijacic Cenzer, I., & Covinsky, K. E. (2012). Loneliness in Older Persons. *Archives of Internal Medicine*, 172(14), 1078–1084. <https://doi.org/10.1001/archinternmed.2012.1993>
- Perlman, D. (1988). Loneliness: A life-span, family perspective. In R. M. Milardo (Ed.), *Families and social networks* (pp. 190–220). Sage Publications, Inc.
- Peterson, R. A., & Brown, S. P. (2005). On the Use of Beta Coefficients in Meta-Analysis. *Journal of Applied Psychology*, 90(1), 175–181. <https://doi.org/10.1037/0021-9010.90.1.175>

- \*Philips, T. (2015). *Suicidal ideation: Racial differences in risk and protective factors among men in late-life*. (Publication No. 3629531) [Doctoral Dissertation, Fielding University]. ProQuest Dissertation Publishing. <https://www.proquest.com/docview/1561549730?>
- Pinquart, M., & Sorensen, S. (2001). Influences on Loneliness in Older Adults: A Meta-Analysis. *Basic and Applied Social Psychology*, 23(4), 245–266.  
[https://doi.org/10.1207/s15324834basp2304\\_2](https://doi.org/10.1207/s15324834basp2304_2)
- Pleck, J. H. (1995). The gender role strain paradigm: An update. In R. F. Levant & W. S. Pollack (Eds.), *A new psychology of men* (pp. 11–32). Basic Books/Hachette Book Group.
- Ratcliffe, J. M., Galdas, P., & Kanaan, M. (2020). *Men and loneliness in the 'west': A critical interpretive synthesis*. Research Square. <https://doi.org/10.21203/rs.3.rs-17584/v1>
- Ratcliffe, J., Kanaan, M., & Galdas, P. (2023). Reconceptualising men's loneliness: An interpretivist interview study of UK-based men. *Social Science & Medicine*, 332, Article 116129. <https://doi.org/10.1016/j.socscimed.2023.116129>
- Reeves, K. W., Vasconez, G., & Weiss, S. J. (2022). Characteristics of Suicidal Ideation: A Systematic Review. *Archives of Suicide Research*, 26(4), 1736–1756.  
<https://doi.org/10.1080/13811118.2021.2022551>
- Rice, S. M., Aucote, H. M., Möller-Leimkühler, A. M., Parker, A. G., Kaplan, R. A., Seidler, Z. E., Dhillon, H. M., & Paulamming, A. G. (2016). Conformity to masculine norms and the mediating role of internalised shame on men's depression: Findings from an Australian community sample. *International Journal of Men's Health*, 15(2), 157–164. <https://doi.org/10.3149/jmh.1502.157>

- Rico-Urbe, L. A., Caballero, F. F., Martín-María, N., Cabello, M., Ayuso-Mateos, J. L., & Miret, M. (2018). Association of loneliness with all-cause mortality: A meta-analysis. *PLOS ONE*, *13*(1), Article e0190033. <https://doi.org/10.1371/journal.pone.0190033>
- Robertson, S., Gough, B., Hanna, E., Raine, G., Robinson, M., Seims, A., & White, A. (2018). Successful mental health promotion with men: the evidence from ‘tacit knowledge’. *Health Promotion International*, *33*(2), 334–344. <https://doi.org/10.1093/heapro/daw067>
- Robinson, S., Anderson, E., & White, A. (2018). The Bromance: Undergraduate Male Friendships and the Expansion of Contemporary Homosocial Boundaries. *Sex Roles*, *78*(1-2), 94–106. <https://doi.org/10.1007/s11199-017-0768-5>
- Russell, D., Peplau, L. A., & Cutrona, C. E. (1980). The revised UCLA Loneliness Scale: Concurrent and discriminant validity evidence. *Journal of Personality and Social Psychology*, *39*(3), 472–480. <https://doi.org/10.1037/0022-3514.39.3.472>
- Ryan, J., Lopian, L., Le, B., Edney, S., Van Kessel, G., Plotnikoff, R., Vandelanotte, C., Olds, T., & Maher, C. (2019). It’s not raining men: a mixed-methods study investigating methods of improving male recruitment to health behaviour research. *BMC Public Health*, *19*(1). <https://doi.org/10.1186/s12889-019-7087-4>
- Sanderson, S., Tatt, I. D., & Higgins, J. P. T. (2007). Tools for assessing quality and susceptibility to bias in observational studies in epidemiology: a systematic review and annotated bibliography. *International Journal of Epidemiology*, *36*(3), 666–676. <https://doi.org/10.1093/ije/dym018>
- Seidler, Z. E., Dawes, A. J., Rice, S. M., Oliffe, J. L., & Dhillon, H. M. (2016). The role of masculinity in men's help-seeking for depression: A systematic review. *Clinical Psychology Review*, *49*, 106–118. <https://doi.org/https://doi.org/10.1016/j.cpr.2016.09.002>

- Seidler, Z. E., Rice, S. M., Oliffe, J. L., Fogarty, A. S., & Dhillon, H. M. (2018a). Men In and Out of Treatment for Depression: Strategies for Improved Engagement. *Australian Psychologist*, 53(5), 405–415. <https://doi.org/10.1111/ap.12331>
- Seidler, Z. E., Rice, S. M., River, J., Oliffe, J. L., & Dhillon, H. M. (2018b). Men's Mental Health Services: The Case for a Masculinities Model. *The Journal of Men's Studies*, 26(1), 92–104. <https://doi.org/10.1177/1060826517729406>
- \*Seidler, Z. E., Wilson, M. J., Rice, S. M., Kealy, D., Oliffe, J. L., & Ogrodniczuk, J. S. (2022). Virtual connection, real support? A study of loneliness, time on social media and psychological distress among men. *International Journal of Social Psychiatry*, 68(2), 288–293. <https://doi.org/10.1177/0020764020983836>
- Sharp, P., Bottorff, J. L., Rice, S., Oliffe, J. L., Schulenkorf, N., Impellizzeri, F., & Caperchione, C. M. (2022). “People say men don’t talk, well that’s bullshit”: A focus group study exploring challenges and opportunities for men’s mental health promotion. *PLOS ONE*, 17(1), Article e0261997. <https://doi.org/10.1371/journal.pone.0261997>
- \*Sharp, P., Kealy, D., Rice, S. M., Seidler, Z. E., Oliffe, J. L., & Ogrodniczuk, J. S. (2023). Existential isolation and psychological distress during COVID-19: The role of loneliness and resilient coping in Canadian help-seeking men. *Journal of Affective Disorders*, 324, 279–285. <https://doi.org/10.1016/j.jad.2022.12.133>
- Sileo, K. M., & Kershaw, T. S. (2020). Dimensions of masculine norms, depression, and mental health service utilization: Results from a prospective cohort study among emerging adult men in the United States. *American Journal of Men's Health*, 14(1), 1–16. <https://doi.org/10.1177/1557988320906980>
- Simmonds, M. (2015). Quantifying the risk of error when interpreting funnel plots. *Systematic Reviews*, 4(1), Article 24. <https://doi.org/10.1186/s13643-015-0004-8>

- \*Szuster, E., Pawlikowska-Gorzelańczyk, A., Kostrzewska, P., Mandera-Grygierzec, A., Rusiecka, A., Biernikiewicz, M., Brawańska, K., Sobieszcańska, M., Rożek-Piechura, K., & Kałka, D. (2022). Mental and Sexual Health of Men in Times of COVID-19 Lockdown. *International Journal of Environmental Research and Public Health*, 19(22), Article 15327. <https://doi.org/10.3390/ijerph192215327>
- Tannenbaum, C., & Frank, B. (2011). Masculinity and Health in Late Life Men. *American Journal of Men's Health*, 5(3), 243–254. <https://doi.org/10.1177/1557988310384609>
- Tengku Mohd, T. A. M., Yunus, R. M., Hairi, F., Hairi, N. N., & Choo, W. Y. (2019). Social support and depression among community dwelling older adults in Asia: a systematic review. *BMJ Open*, 9(7), Article e026667. <https://doi.org/10.1136/bmjopen-2018-026667>
- \*Tran, N. K., Le, T. P., Krause, K. D., Martino, R. J., & Halkitis, P. N. (2023). An exploration of racial differences of psychosocial stressors and their association with mental health between Asian and White sexual minority men: The P18 cohort study. *Asian American Journal of Psychology*. Advance online publication. <https://doi.org/10.1037/aap0000309>
- Valtorta, N. K., Kanaan, M., Gilbody, S., & Hanratty, B. (2016). Loneliness, social isolation and social relationships: what are we measuring? A novel framework for classifying and comparing tools. *BMJ Open*, 6(4), Article e010799. <https://doi.org/10.1136/bmjopen-2015-010799>
- \*Viertö, S., Kiviruuu, O., Piirtola, M., Kaprio, J., Korhonen, T., Marttunen, M., & Suvisaari, J. (2021). Factors contributing to psychological distress in the working population, with a special reference to gender difference. *BMC Public Health*, 21(1), Article 611. <https://doi.org/10.1186/s12889-021-10560-y>
- Veritas Health Innovation (2023) *Covidence* [computer application]. Available at [www.covidence.org](http://www.covidence.org)

- Von Elm, E., Altman, D. G., Egger, M., Pocock, S. J., Gøtzsche, P. C., & Vandenbroucke, J. P. (2007). The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: guidelines for reporting observational studies. *The Lancet*, 370(9596), 1453–1457. [https://doi.org/10.1016/s0140-6736\(07\)61602-x](https://doi.org/10.1016/s0140-6736(07)61602-x)
- Wang, J., Lloyd-Evans, B., Giacco, D., Forsyth, R., Nebo, C., Mann, F., & Johnson, S. (2017). Social isolation in mental health: a conceptual and methodological review. *Social Psychiatry and Psychiatric Epidemiology*, 52(12), 1451–1461. <https://doi.org/10.1007/s00127-017-1446-1>
- Wells, G. A., Shea, B., O'Connell, D., Peterson, J., Welch, V., Losos, M., & Tugwell, P. (2000). *The Newcastle-Ottawa Scale (NOS) for assessing the quality of nonrandomised studies in meta-analysis*. Ottawa Hospital Research Institute. [https://www.ohri.ca/programs/clinical\\_epidemiology/oxford.asp](https://www.ohri.ca/programs/clinical_epidemiology/oxford.asp)
- Willis, P., & Vickery, A. (2022). Loneliness, coping practices and masculinities in later life: Findings from a study of older men living alone in England. *Health & Social Care in the Community*, 30(5). <https://doi.org/10.1111/hsc.13732>
- Witte, T. K., Fitzpatrick, K. K., Joiner, T. E., Jr., & Schmidt, N. B. (2005). Variability in suicidal ideation: A better predictor of suicide attempts than intensity or duration of ideation? *Journal of Affective Disorders*, 88(2), 131–136. <https://doi.org/10.1016/j.jad.2005.05.019>
- Wrzus, C., Hänel, M., Wagner, J., & Neyer, F. J. (2013). Social network changes and life events across the life span: A meta-analysis. *Psychological Bulletin*, 139(1), 53–80. <https://doi.org/10.1037/a0028601>
- Yanguas, J., Pinazo-Henandis, S., & Tarazona-Santabalbina, F. J. (2018). The complexity of loneliness. *Acta Biomed*, 89(2), 302–314. <https://doi.org/10.23750/abm.v89i2.7404>

**Appendix 1**

Logic Grid

Database	male	loneliness	Mental health
APA PsycInfo	(Male OR males OR men OR mens OR father* OR brother* OR boyfriend* OR husband* OR mate OR mates OR boy OR boys OR masculinity).ti,ab	exp *loneliness/ OR (lonely OR loneliness OR isolation OR Forlorn* OR Social* Isol* OR Feel* isolate* OR emotional lonel* OR intimate lonel* OR relation* lonel* OR social lonel* OR collective lonel*).ti,ab.	(Emotional* Stress* OR distress OR Psychiatric* Stress* OR Mental* Stress* OR Emotional* Distress* OR Psychiatric* Distress* OR Mental* Distress* OR Emotional* Health* OR Mental* Health* OR Psychiatric* Health* OR Emotion* Ill* OR Mental* Ill* OR Psychiatric* disorder* OR Emotional* disorder* OR Mental* disorder* OR Psychiatric* disorder* OR suicid* OR suicid* behavio?r* OR suicid* attempt OR self harm OR self harm* OR self-harm OR self-harm* OR self injur* OR self-injur* OR self injur* behavio?r* OR self-injur* behavio?r* OR self-mutilat* OR self mutilat*).ti,ab OR (self adj4(harm* OR injur* OR injur* behavio?r* OR mutlat*).ti,ab OR (suicid* adj4(attempt* OR behavio?r* OR ideation)).ti,ab OR exp *suicide OR exp *suicidal ideation

Ovid MEDLINE	(Male OR males OR men OR mens OR father* OR brother* OR boyfriend* OR husband* OR mate OR mates OR boy OR boys OR masculinity).ti,ab	exp *loneliness/ OR (lonely OR loneliness OR isolation OR Forlorn* OR Social* Isol* OR Feel* isolate* or emotional lonel* OR intimate lonel* OR relation* lonel* OR social lonel* OR collective lonel*).ti,ab.	(Emotional* Stress* OR distress OR Psychiatric* Stress* OR Mental* Stress* OR Emotional* Distress* OR Psychiatric* Distress* OR Mental* Distress* OR Emotional* Health* OR Mental* Health* OR Psychiatric* Health* OR Emotion* Ill* OR Mental* Ill* OR Psychiatric* disorder* OR Emotional* disorder* OR Mental* disorder* OR Psychiatric* disorder* OR suicid* OR suicid* behavio?r* OR suicid* attempt OR self harm OR self harm* OR self-harm OR self-harm* OR self injur* OR self-injur* OR self injur* behavio?r* OR self-injur* behavio?r* OR self-mutilat* OR self mutilat*).ti,ab OR (self adj4(harm* OR injur* OR injur* behavio?r* OR mutlat*).ti,ab OR (suicid* adj4(attempt* OR behavio?r* OR ideation)).ti,ab OR exp *suicide OR exp *suicidal ideation
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Ovid Embase	(Male OR males OR men OR mens OR father* OR brother* OR boyfriend* OR husband* OR mate OR mates OR boy OR boys OR masculinity).ti,ab	exp *loneliness/ OR (lonely OR loneliness OR isolation OR Forlorn* OR Social* Isol* OR Feel* isolate* or emotional lonel* OR intimate lonel* OR relation* lonel* OR social lonel* OR collective lonel*).ti,ab.	(Emotional* Stress* OR distress OR Psychiatric* Stress* OR Mental* Stress* OR Emotional* Distress* OR Psychiatric* Distress* OR Mental* Distress* OR Emotional* Health* OR Mental* Health* OR Psychiatric* Health* OR Emotion* Ill* OR Mental* Ill* OR Psychiatric* disorder* OR Emotional* disorder* OR Mental* disorder* OR Psychiatric* disorder* OR suicid* OR suicid* behavio?r* OR suicid* attempt OR self harm OR self harm* OR self-harm OR self-harm* OR self injur* OR self-injur* OR self injur* behavio?r* OR self-injur* behavio?r* OR self-mutilat* OR self mutilat*).ti,ab OR (self adj4(harm* OR injur* OR injur* behavio?r* OR mutlat*).ti,ab OR (suicid* adj4(attempt* OR behavio?r* OR ideation)).ti,ab OR exp *suicide OR exp *suicidal ideation
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**Appendix 2**

## Adapted Newcastle-Ottawa Quality Scale

\* 1-star awarded; \*\* 2-stars awarded

**Selection** (Maximum 4 stars)

- 1) Representativeness of the sample:
  - a. Representative of the average in target population (e.g., random sampling or stratification reflecting census data). \*
  - b. Somewhat representative of the average in the target population (e.g., nonprobability sampling of community sample). \*
  - c. Selected group of users (e.g., recruited from HeadsUpGuys.org).
  - d. No description of the sampling strategy.
- 2) Sample size
  - a. Justified and satisfactory. \*
  - b. Not justified.
- 3) Ascertainment of predictor
  - a. Validated measurement. \*\* (e.g., UCLA loneliness scale).
  - b. Non-validated measure, but the measure is described and justified. \* (e.g., single-item measure).
  - c. No description of measurement tool.

**Comparability** (Maximum 2 stars)

- 4) Sample demographics
  - a. Are described and relevant confounding factors (if any) are controlled for. \*
  - b. Sample demographics are not described.
- 5) Eligibility criteria
  - a. Inclusion and exclusion criteria are specified and followed; missing data explained where applicable. \*
  - b. No description of eligibility criteria.

**Outcome** (Maximum 4 stars):

- 6) Outcome measurement:
  - a. Validated scale used and described. \* (e.g., Becks Depression inventory, Patient Health Questionnaire-8)
  - b. Non-validated scale used.
  - c. No description of scale used.
- 7) Ascertainment of outcome measurement.
  - a. Independent blind assessment. \*\*
  - b. Record linkage. \*\*
  - c. Self-report. \*
  - d. No description.
- 8) Statistical Test.
  - a. The statistical test used to analyse the data is clearly described and appropriate, and the measurement of the association is presented, including the probability level (p value). \*
  - b. The statistical test is not appropriate, not described, or incomplete.

**Reporting Bias** (Maximum 2 stars):

- 9) Financial backing.
  - a. Clear statement regarding potential financial sponsorship. \*
  - b. Not addressed.
- 10) Authors affiliation.
  - a. Clearly identified\*
  - b. Not addressed.

## Appendix 3

## Between Study Quality Ratings

Table 4

*Evaluation of Included studies using the adapted NOS*

Lead Author (date)	Selection		Comparability		Outcome			Reporting		Total stars	
	Representativeness of the sample (1-star)	Sample Size (1-star)	Ascertainment of predictor (2-star)	Sample Demographics (1-star)	Eligibility Criteria (1-star max)	Outcome measurement (1-star)	Ascertainment of outcome measurement (2-stars)	Statistical Test (1 star max)	Financial Backing (1-star)		Author Affiliation (1-star)
Alpass & Neville (2003)	*		**	*	*	*	*	*			8
Alpass & Neville (2004)	*		**	*		*	*	*		*	8
Brown (2023)			*	*	*	*	*	*	*	*	8
Ernst (2021)	*	*	**	*	*	*	*	*	*	*	11
Jackson & Cochran (1991)	*		**	*		*	*	*		*	8
Kealy (2021)	*		*	*	*	*	*	*	*	*	9
Keum (2021)			*	*	*	*	*	*	*	*	8
Lutzman (2021)	*		**	*	*	*	*	*		*	9
Mansour (2021)	*		**	*	*	*	*	*		*	9
McQuaid (2021)	*		**	*	*	*	*	*	*	*	10
Neville (2018)	*		**	*	*	*	*	*	*	*	11
Ogrodniczuk (2023)			**	*	*	*	*	*	*	*	9
Phillips (2015)	*		**	*	*	*	*	*		*	9
Seidler (2022)			*	*	*	*	*	*	*	*	8
Sharp (2023)			**	*	*	*	*	*	*	*	9
Szuster (2022)	*		*	*	*	*	*	*	*	*	9
Tran (2023)	*		**	*	*	*	*	*		*	9
Viertiö (2021)	*			*	*	*	*	*	*	*	8

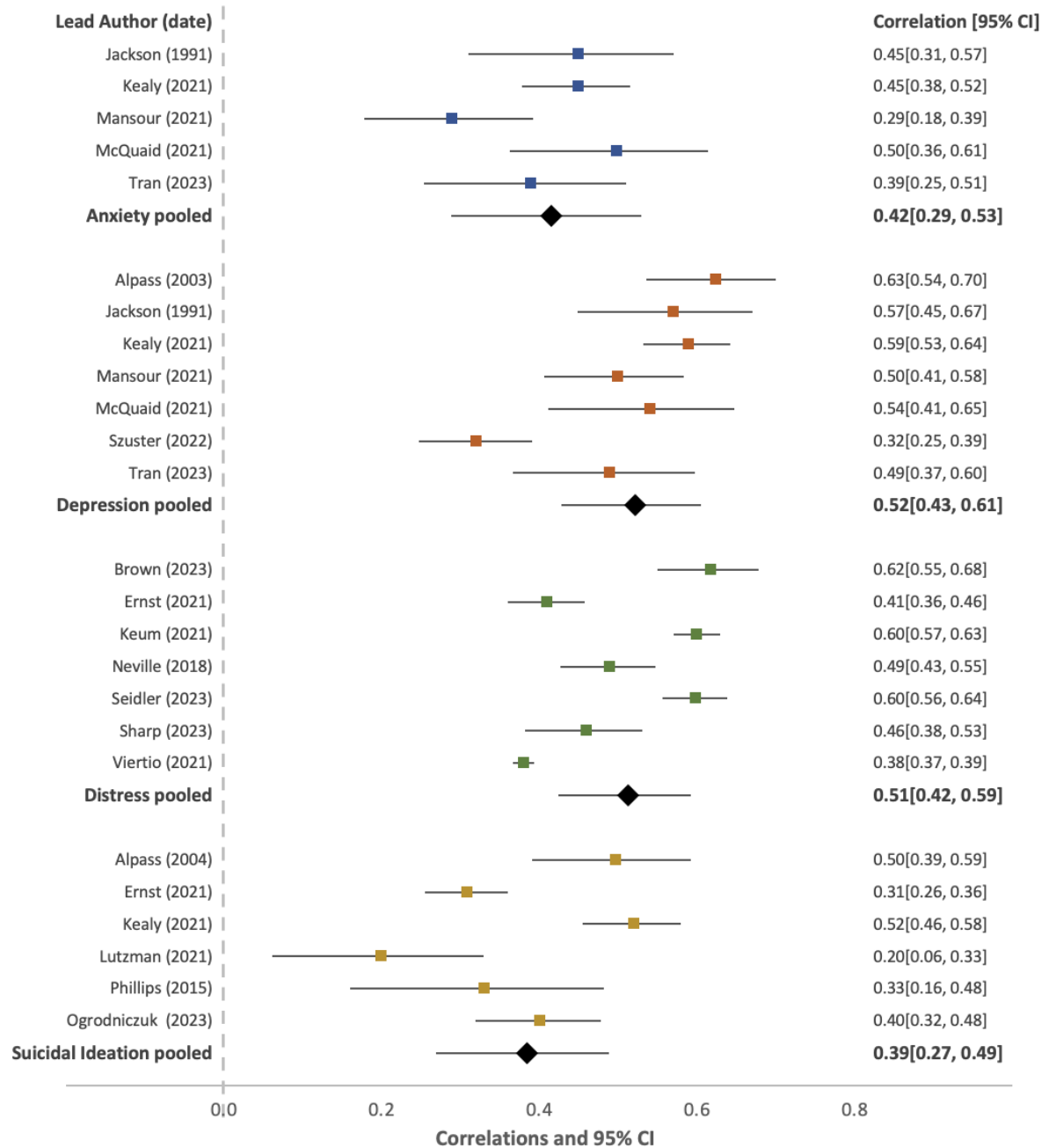
Note. \* Denotes amount of stars awarded for that category

**Appendix 4**

Individual Study Data Grouped by Outcome

**Figure 3**

*Forest plot of individual study effect size r and associated confidence intervals for each mental health outcome*



**Appendix 5**

## Scatterplot of Meta-Regression Results

**Figure 4***Regression of Fisher's Z on mean age.*