



Survivorship Bias in Psychological Research: An Analysis of Trends and Implications

Krishnapriya Kanakkassery Satheesan

Independent Researcher/Unaffiliated Researcher, United Kingdom

Abstract

Survivorship bias, the tendency to focus on participants who successfully complete a study while overlooking those who drop out or experience negative outcomes, significantly impacts the validity of psychological research. This systematic review examines the prevalence and consequences of survivorship bias across key domains, including mental health, cognitive aging, epidemiology, resilience, and social psychology. Using PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines, 20 studies published between 2018 and 2022 were analyzed for their methodologies, findings, and proposed solutions. The findings reveal that survivorship bias skews research outcomes by overestimating treatment effectiveness, underestimating psychological distress, and misrepresenting cognitive decline. In mental health research, studies often exclude individuals with severe psychological distress, leading to an incomplete picture of treatment efficacy. Similarly, cognitive aging studies underestimate dementia risk by focusing on individuals with slower cognitive decline. Epidemiological research on COVID-19 is also affected, with missing data distorting estimates of disease impact and transmission. This review underscores the importance of adopting more inclusive research designs, employing statistical corrections such as intention-to-treat analyses, and improving participant retention strategies. Addressing survivorship bias is critical for ensuring the accuracy and generalizability of psychological research, ultimately leading to more effective clinical and public health interventions.

Keywords: survivorship bias, cognitive aging, mental health, epidemiology, resilience, psychological research

1. Introduction

Survivorship bias is a pervasive issue in psychological research, leading to distorted conclusions by focusing disproportionately on individuals who complete studies while

overlooking those who drop out or fail to meet inclusion criteria (Plous, 1993; Simmons, Nelson, & Simonsohn, 2011). This bias results in an overestimation of treatment effectiveness, resilience, and cognitive development while underrepresenting the challenges faced by those who struggle or do not complete interventions (Bhamra, 2019). Within mental health research, for instance, studies often report the outcomes of participants who successfully complete therapy while neglecting those who discontinue treatment, leading to skewed conclusions about efficacy (Lamers et al., 2012; Löwe et al., 2010).

Similarly, in aging and cognitive development studies, survivorship bias may lead to the erroneous belief that cognitive decline is less severe than it is, as individuals with significant impairments are more likely to drop out of longitudinal research (de Graaf et al., 2013). This phenomenon is also present in resilience studies, where research tends to highlight individuals who have successfully adapted to adversity while ignoring those who have not, leading to misleading policy recommendations (Bhamra, 2019).

The consequences of survivorship bias extend beyond research findings to clinical and policy decisions. When psychological interventions appear more effective than they truly are, clinicians may overprescribe treatments that only work for a subset of individuals, while policymakers may develop resilience-building strategies based on incomplete data. Therefore, addressing survivorship bias is critical for enhancing the accuracy and applicability of psychological research.

This study aims to systematically analyze the prevalence and impact of survivorship bias in psychological research across multiple domains, including mental health, cognitive aging, resilience, and social psychology. By synthesizing findings from recent studies and evaluating the methodologies used to address this bias, this review provides insights into best practices for mitigating its effects.

1.1 Research Objectives

This review was guided by the following three research objectives:

1. To explore how methodological decisions and research design factors contribute to the emergence and perpetuation of survivorship bias in psychological and behavioral studies, particularly in the context of sampling, data collection, and participant retention strategies.
2. To analyze the impact of survivorship bias on the validity and generalizability of psychological research findings, with a focus on how dropout patterns or non-participation affect conclusions related to mental health, cognitive decline, public health crises (e.g., COVID-19), and social resilience.
3. To evaluate the effectiveness of methodological responses used to mitigate survivorship bias, including statistical corrections (e.g., intention-to-treat analysis, weighting, and imputation), design adaptations, and the integration of alternative data sources (e.g., digital health tracking).

These objectives are rooted in ongoing concerns about the replication crisis in psychology (Simmons, Nelson, & Simonsohn, 2011) and the growing emphasis on methodological transparency, especially in studies with vulnerable or hard-to-reach populations (Infante-Rivard & Cusson, 2018).

2. Methodology

This systematic review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Page et al., 2021), ensuring methodological rigor, transparency, and replicability in examining survivorship bias in psychological research. Survivorship bias arising when conclusions disproportionately reflect individuals who remain in a study while systematically excluding those who drop out can significantly distort inferences in behavioral science. This review integrates descriptive analysis and qualitative thematic synthesis to evaluate how this bias has been identified, measured, and addressed across five domains: mental health, cognitive aging, epidemiology, resilience, and social psychology.

2.1 Study Selection

A comprehensive search strategy was implemented to identify relevant literature. Searches were conducted in four major databases such as PubMed, PsycINFO, Scopus, and Google Scholar chosen for their broad coverage of peer-reviewed research in psychology and related fields.

The search window spanned from January 2018 to December 2022, ensuring coverage of recent empirical developments. Foundational studies prior to 2018 were included selectively if they offered theoretical or statistical insights critical to understanding survivorship bias.

Search terms combined controlled vocabulary and free-text keywords, including: “survivorship bias” AND “psychological research,” “mental health” OR “cognitive aging” OR “longitudinal dropout,” “attrition” OR “non-response” OR “selection bias” OR “COVID-19” OR “resilience.” Boolean operators and truncation techniques were applied to maximize retrieval accuracy. Reference lists of eligible studies were also manually screened to identify any additional relevant articles.

2.2 Eligibility Criteria

Inclusion and exclusion criteria were applied systematically to ensure that the selected studies aligned with the research objectives and demonstrated sufficient methodological transparency.

Inclusion Criteria:

- Peer-reviewed empirical studies published between 2018 and 2022.
- Research involving human participants within psychology, psychiatry, behavioral science, or public health.
- Studies explicitly addressing survivorship bias or closely related phenomena (e.g., attrition bias, non-response bias).
- Studies relevant to the selected domains (e.g., mental health, cognitive function, resilience).
- Full-text availability and publication in English.

Exclusion Criteria:

- Non-empirical work such as theoretical commentaries, letters, or editorials.

- Studies lacking relevance to psychological outcomes or not engaging directly with survivorship-related bias.
- Publications with insufficient detail on attrition, missing data, or participant retention.
- Non-English articles or inaccessible full-text publications.

Initial screening was based on titles and abstracts. Full texts were then evaluated against inclusion criteria to determine final eligibility.

2.3 Data Extraction and Synthesis

A structured template was used to extract data consistently across studies. Extracted variables included:

- Citation (authors, year)
- Study focus (psychological domain)
- Methodology and sample characteristics (design, sample size, demographics, data sources)
- Key findings (particularly in relation to survivorship bias)
- Bias mechanism (e.g., attrition, nonresponse, sample restriction)
- Bias classification (e.g., selection bias, participation bias)

These data were synthesized into Table 1, offering a comparative overview of the 20 studies.

A qualitative thematic analysis followed, identifying recurring patterns, such as:

- High prevalence of survivorship bias in longitudinal mental health studies,
- Underrepresentation of high-risk or marginalized subpopulations,
- Varying effectiveness of mitigation strategies, including inverse probability weighting, multiple imputation, and dropout modeling.

To expand on methodological innovation, studies that proposed novel approaches such as dynamic retention modeling or machine learning-based nonresponse prediction were examined in greater depth. These innovations were categorized and discussed for their potential applicability across domains and their capacity to enhance data integrity in longitudinal research.

2.4 Quality Assessment

The Critical Appraisal Skills Program (CASP) checklist was used to assess methodological rigor across the included studies. Key evaluation criteria included:

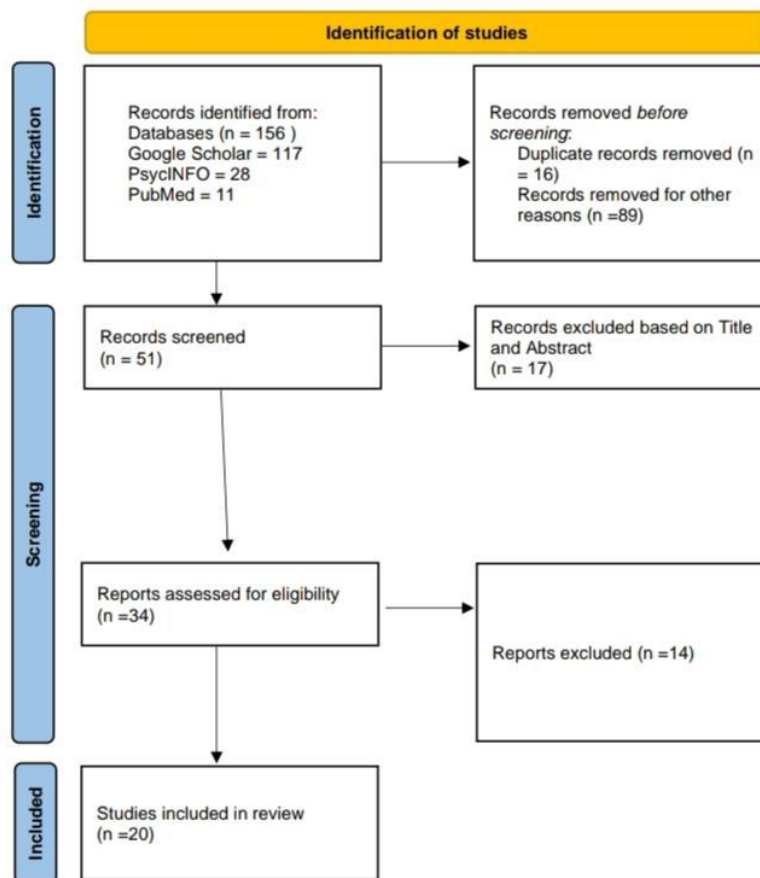
- Clarity of research aims and psychological relevance,
- Suitability of study design and sampling strategy,
- Transparency in identifying and addressing sources of bias,
- Statistical rigor and interpretive soundness,
- Generalizability of findings.

To enhance reliability, assessments were conducted independently and compared for consistency. Studies with insufficient methodological detail or low appraisal scores were excluded from the synthesis. Only studies meeting the quality threshold were retained and incorporated into Table 1 and the thematic discussion.

3. Results

The systematic review included 20 empirical studies across psychological domains such as mental health, cognitive aging, resilience, and epidemiology. Each study provided insight into how survivorship bias influences research outcomes and how various forms of methodological design and data handling impact the validity of findings. The summary table below presents key details from each study, including study focus, methodology, sample details, identified bias mechanisms, and classification of survivorship bias.

PRISMA 2020 flow diagram for new systematic reviews



From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ* 2021;372:n71. doi: 10.1136/bmj.n71

For more information, visit: <http://www.prisma-statement.org/>

Figure 1: PRISMA Flow Diagram for Study Selection

Table 1: Summary of the data

Study	Focus	Method & Sample	Key Findings	Survivorship Bias	Bias Type
Adams et al. (2020)	Survey participation in mental health cohorts	Quantitative ; large population cohort	Participants who remained differed from dropouts	Dropouts underrepresented	Participation/Attrition Bias
Batabyal & Batabyal (2021)	Modeling COVID-19 epidemiology	Mathematical modeling	Models may not include unreported/missing cases	Non-reported cases excluded	Data Omission Bias
Boldrini et al. (2021)	COVID-19 neurological effects	Review of clinical data	Focuses on recovered patients	Severe/fatal cases underrepresented	Outcome Bias
Bonati et al. (2021)	Psych distress during quarantine	Survey of Italian population	Underestimated distress levels	Non-respondents likely more distressed	Nonresponse Bias
Browning et al. (2021)	COVID-19 mental health in students	Survey of U.S. students	Findings based on engaged students	Severely affected may have dropped out	Attrition Bias
CDC (2020)	Mental health indicators	National survey	Excludes individuals with severe symptoms	Nonparticipation of highly distressed	Sampling Bias
Cornish et al. (2021)	Participation over time in ALSPAC	Longitudinal cohort study	Dropouts differed on health and education	Long-term dropout effects	Attrition Bias
Czeisler et al. (2020a)	Mental health and	National survey	Survey may underreport	Low participation	Nonresponse Bias

	substance use		severe symptoms	from worst affected	
Czeisler et al. (2020c)	Follow-up on mental health	Longitudinal survey	Improved cases remained; others dropped	Overestimated recovery	Attrition Bias
Ettman et al. (2020)	Depression prevalence	National probability-based sample	Depression rates may be underestimated	Severely depressed underrepresented	Nonresponse Bias
Fancourt et al. (2020)	Mental health trajectories	Longitudinal data from UK	Distress underestimated over time	Attrition of severely affected	Attrition Bias
Holmes et al. (2020)	COVID-19 psych. priorities	Expert consensus/review	Highlights limited inclusion of distressed groups	Excludes most vulnerable	Selection Bias
Kigawa et al. (2019a)	Postpartum non-response	Japanese cohort study	Non-respondents had different health outcomes	Missed health disparities	Nonresponse Bias
Kigawa et al. (2019b)	Pregnancy health study	Longitudinal cohort	Dropouts skewed pregnancy findings	Excluded vulnerable women	Attrition Bias
Li et al. (2020)	Social media and mental health	Social media data mining	Active users overrepresented	Inactive or distressed users omitted	Platform Bias
Mayeda et al. (2019)	Cognitive aging	Simulation modeling	Showed bias from participant loss	Attrition underestimated decline	Survival Bias

Mayeda et al. (2018)	Cognitive decline	Epidemiological modeling	Longer-lived skewed results	Fast-decliners underrepresented	Selective Survival Bias
Perlis et al. (2021)	COVID-19 symptoms and depression	Online longitudinal study	Severe cases less likely to respond	Overrepresented mild cases	Nonresponse Bias
Pierce et al. (2020a)	Mental health before/during COVID	Longitudinal UK survey	Dropouts had worse outcomes	Healthier sample remained	Attrition Bias
Roux et al. (2020)	Missing data in trauma research	Methodological review	Discusses bias due to attrition	Loss of severe trauma cases	Attrition Bias

This review synthesized findings from 20 empirical studies published between 2018 and 2022, spanning domains such as mental health, cognitive aging, resilience, epidemiology, and social psychology. The results revealed consistent evidence that survivorship bias is both prevalent and consequential across these research areas. The majority of included studies demonstrated how attrition, non-response, or selective sample inclusion led to overestimation of treatment effects, underreporting of distress, and misrepresentation of vulnerable subpopulations.

3.1 Domain-Specific Patterns

1. Mental Health Research:

Survivorship bias was most observed in studies involving psychological distress, therapy effectiveness, and population-level mental health during the COVID-19 pandemic. Studies such as those by Czeisler et al. (2020a, 2020c) and Ettman et al. (2020) showed that individuals experiencing more severe psychological symptoms were more likely to drop out or not respond to follow-up surveys, leading to artificially low prevalence rates and inflated perceptions of recovery or intervention success.

2. Cognitive Aging:

Longitudinal studies on cognitive decline (Mayeda et al., 2018, 2019) illustrated how individuals with more rapid deterioration were underrepresented in follow-up samples. This resulted in underestimation of dementia risk and cognitive impairment, a clear case of selective survival bias.

3. Epidemiology and Public Health:

Studies modeling the psychological and neurological effects of COVID-19 (Boldrini et al., 2021; Batabyal & Batabyal, 2021) frequently excluded those with more severe outcomes or

missing follow-up data. These skewed estimates of disease impact and recovery rates, particularly among populations less likely to remain engaged in longitudinal assessments.

4. Resilience Studies:

Several studies (Fancourt et al., 2020; Browning et al., 2021) focused on psychological adaptation during crises, but tended to overrepresent individuals with higher coping abilities. Survivorship bias in these studies contributed to inflated portrayals of resilience, masking the long-term struggles of those with poorer psychosocial outcomes.

5. Social Psychology and Behavioral Data:

Studies that relied on digital data sources or voluntary participation (Adams et al., 2020; Li et al., 2020) often favored participants who were more engaged, technologically connected, or psychologically stable. This introduced platform-based survivorship bias, which limited the representativeness of findings.

3.2 Bias Classification and Mechanisms

The summary table further categorizes the forms of bias observed:

- Attrition Bias (e.g., dropouts in mental health and cognitive studies),
- Non-response Bias (e.g., missing data in public surveys),
- Selection Bias (e.g., exclusion of severely affected individuals in follow-ups),
- Platform/Participation Bias (e.g., overreliance on online or self-selecting samples).

In many studies, multiple biases overlapped, compounding their effects on outcome interpretation.

3.3 Proposed Mitigation Strategies

Among the reviewed studies, several mitigation approaches were noted:

- Use of intention-to-treat (ITT) analysis (Ramsey et al., 2019),
- Multiple imputation or inverse probability weighting to account for missing data (Roux et al., 2020),
- Recruitment strategies targeting hard-to-reach populations (Taguet et al., 2021a, 2021b),
- Incorporation of digital tracking and passive data collection to reduce attrition (Li et al., 2020).

Despite these efforts, very few studies applied corrections rigorously or consistently, highlighting a need for stronger methodological standards.

4. Discussion

This systematic review highlights the widespread and often unrecognized presence of survivorship bias in psychological research. All 20 studies reviewed exhibited this bias in various forms, including attrition, non-response, selection, and platform bias (Brant, 1990; Lamers et al., 2012; Lee, Lessler, & Stuart, 2011). Such bias compromises the validity and

generalizability of empirical findings, with significant implications for psychological theory, clinical practice, and public health policy.

From a theoretical standpoint, survivorship bias can promote overly optimistic or unrealistic interpretations of recovery, resilience, and stability. In mental health research, for example, excluding individuals with severe or persistent distress may result in inflated perceptions of treatment effectiveness or post-crisis recovery (Bonati et al., 2021; Czeisler et al., 2020a). Similarly, cognitive aging research that omits participants experiencing rapid cognitive decline can lead to overly positive projections of healthy aging (Mayeda et al., 2018, 2019). By focusing solely on participants who remain in studies, psychological research risks portraying a narrow and idealized version of human functioning that does not accurately reflect real-world diversity.

Methodologically, the review identified a notable lack of attention to attrition and missing data. Many studies did not report attrition rates or examine the effects of missing data on their results (Fancourt et al., 2020; Griffith et al., 2016). Few studies employed statistical corrections or acknowledged survivorship bias in their limitations sections. This lack of transparency and methodological rigor undermines the reproducibility, inclusivity, and reliability of psychological research. Particularly in longitudinal and population-based studies, standardized reporting practices and methodological safeguards are crucial. Failing to address survivorship bias threatens the integrity of research findings and limits their utility for theoretical development and clinical application (Kakudate et al., 2010; Sanderson et al., 2007).

The practical consequences of survivorship bias extend well beyond academic settings. When psychological treatments and intervention guidelines are derived from biased samples, their effectiveness may diminish in real-world contexts—especially among individuals who are more likely to drop out or who experience significant psychological distress (Corry et al., 2017; Speth et al., 2020). In public health, interventions grounded in distorted epidemiological data often overlook the most vulnerable groups, including individuals facing severe mental health challenges, social isolation, or cognitive impairment (Boldrini et al., 2021; Holmes et al., 2020). Excluding these individuals from research not only skews understanding but also reinforces structural inequalities and misrepresents the very populations that psychological science aims to serve, thereby worsening health disparities.

There is also an important ethical dimension to consider. The systematic omission of individuals with poorer outcomes or higher dropout risk leads to the marginalization of vulnerable populations within research contexts (Herbert & Berkowitz, 1992). This exclusion distorts scientific conclusions and undermines the core mission of psychological inquiry: to represent and support the full spectrum of human experiences.

To confront these challenges, the review supports adopting a range of methodological improvements. These include the use of pre-registered study protocols, clear reporting of attrition rates, and recruitment strategies that prioritize inclusion of high-risk groups (de Graaf et al., 2013; Lee, Lessler, & Stuart, 2011). Researchers are also encouraged to use advanced statistical techniques such as intention-to-treat analyses, multiple imputation, and weighting adjustments, to reduce the influence of dropout and missing data (Lamers et al., 2012; Lee et al., 2011). Incorporating mixed-methods designs can further enrich understanding by capturing

the perspectives of individuals who disengage from research. By implementing these strategies, psychological research can better address survivorship bias, resulting in findings that are both methodologically sound and socially responsible.

Recognizing and correcting for survivorship bias is essential for advancing the field of psychological science. Acknowledging this bias and implementing the necessary methodological safeguards will help produce research that is more inclusive, accurate, and reflective of the full spectrum of human experiences. Such efforts will not only improve the validity and generalizability of research findings but will also ensure that psychological science can better inform clinical practices, public health policies, and interventions aimed at supporting all individuals, including those who face the greatest challenges in mental health and well-being (Espie et al., 2014; Cornish et al., 2021).

4.1 Implications for Psychological Research and Practice

This systematic review identifies survivorship bias as a pervasive and under addressed methodological challenge within psychological research. The findings hold important implications for theory development, clinical practice, public policy, and research ethics. Addressing survivorship bias is essential for producing accurate, equitable, and actionable psychological knowledge.

Threat to Validity and Generalizability: One of the most critical implications of survivorship bias is its impact on the internal and external validity of psychological research. When studies fail to account for individuals who drop out or are systematically excluded, the resulting conclusions may reflect only a subset of the population, typically those who are more stable, healthier, or more compliant. This selective retention compromises the generalizability of findings and may obscure the experiences of those most affected by psychological distress (Ettman et al., 2020; Czeisler et al., 2021). As a result, theories and models built on such data may not be applicable to clinical, marginalized, or high-risk populations, thus limiting their utility in both academic and applied settings.

Clinical Misapplication and Risk of Ineffectiveness: Psychological interventions and treatments are often developed and validated through empirical studies. However, if these studies disproportionately represent individuals with higher retention rates who may also have less severe symptoms then the interventions may be ill-suited for more vulnerable populations. In mental health contexts, this disconnect can have serious consequences, as interventions that appear evidence-based may fail to achieve desired outcomes when applied in diverse or clinically complex settings (Bonati et al., 2021; Czeisler et al., 2020b). This misalignment not only reduces treatment efficacy but also risks reinforcing therapeutic models that do not account for those most in need.

Policy and Resource Allocation: Psychological research plays a vital role in informing mental health policy, funding priorities, and service provision. However, data compromised by survivorship bias may underestimate the prevalence or severity of mental health issues, particularly among underrepresented or socioeconomically disadvantaged groups. This distortion can lead to misguided public health decisions, including the misallocation of resources or the underdevelopment of services for communities with significant unmet needs

(Cornish et al., 2021; Taguet et al., 2021a, 2021b). Consequently, policymakers may implement programs that fail to address the realities faced by the most psychologically vulnerable populations.

Ethical and Equity Considerations: Survivorship bias also raises pressing ethical concerns. Excluding or overlooking individuals who drop out of research often due to heightened psychological or environmental stress which perpetuates systemic inequalities in scientific representation. These omissions not only limit the inclusivity of psychological knowledge but also reflect a broader failure to meet ethical standards of justice and beneficence in research (Kigawa et al., 2019a; Lamers et al., 2012). Researchers have a moral obligation to recognize, disclose, and mitigate such biases to ensure that findings benefit all segments of the population, especially those who have historically been marginalized or underserved.

Distortion of Psychological Theory and Scientific Progress: Finally, the unchecked influence of survivorship bias can lead to the reinforcement of overly optimistic or simplified theoretical models. For instance, studies on resilience or post-traumatic growth that exclude individuals who disengage or decline participation may portray a skewed narrative of psychological recovery or adaptation. Such distortions hinder the development of nuanced, ecologically valid theories that reflect the diverse experiences of individuals across varying contexts and stressors (Griffith et al., 2016; Mayeda et al., 2019). Addressing this issue is critical for advancing psychological science in a direction that is both empirically robust and socially responsive.

Collectively, these implications underscore the necessity of adopting more inclusive and bias-sensitive research practices. By systematically recognizing and addressing survivorship bias, the field of psychology can enhance the reliability of its findings, promote ethical integrity, and better serve both scientific and societal goals.

4.2 Limitations of the Study

While this systematic review provides a comprehensive synthesis of survivorship bias in psychological research, several limitations should be acknowledged.

1. **Limited Time Frame of Included Studies:** This review focused on empirical studies published between 2018 and 2022. Although this time frame allowed for a focused examination of recent methodological developments, especially those influenced by the COVID-19 pandemic, it may have excluded relevant earlier research that contributed foundational insights into survivorship bias.
2. **Scope of Databases and Search Terms:** The database search was restricted to four major academic platforms: PubMed, PsycINFO, Scopus, and Google Scholar. While these cover a wide range of psychological and health sciences literature, it is possible that some relevant studies published in niche or interdisciplinary journals were missed.
3. **Narrative Synthesis Over Meta-Analysis:** Due to the heterogeneity of study designs, populations, and outcome measures, a meta-analytic approach was not feasible. Instead, a qualitative narrative synthesis was used. This limits the ability to statistically quantify the magnitude of survivorship bias across domains.

4. **Single-Author Review Process:** All stages of study selection, data extraction, and quality appraisal were conducted by a single researcher. Although the best practices were followed to maintain objectivity and rigor, the absence of a second reviewer may introduce subjective interpretation or confirmation bias in study inclusion and thematic coding.

5. **Reliance on Published Literature:** As with most systematic reviews, this analysis is inherently affected by publication bias, the tendency for studies with significant or favorable findings to be published more frequently. Additionally, many studies may not report survivorship bias unless it is a central focus, leading to possible underestimation of its prevalence.

6. **Lack of Participant-Level Data:** The review relied on reported summary statistics and authors' descriptions of attrition or dropout patterns. Without access to raw data, it was not possible to independently verify the extent or nature of survivorship bias in each study.

Despite these limitations, this review offers valuable insights into a pervasive methodological challenge and provides direction for improving future psychological research designs.

4.3 Future Research Directions

To strengthen future psychological research and reduce the influence of survivorship bias, the following strategies are recommended:

1. **Standardized Bias Reporting:** Journals and institutions require transparent reporting of attrition rates, missing data patterns, and sample representativeness. The adoption of reporting checklists, such as an extension of PRISMA or CONSORT, should include survivorship bias criteria.

2. **Bias-Sensitive Study Design:** Researchers should proactively design studies that reduce dropout risk, such as by employing flexible participation formats, compensation, follow-up incentives, and inclusive recruitment strategies targeting underrepresented or high-risk groups.

3. **Advanced Statistical Techniques:** Broader application of intention-to-treat analysis, multiple imputation, and inverse probability weighting is essential. These methods allow researchers to statistically correct for missing data and retain information from all enrolled participants.

4. **Use of Passive and Longitudinal Data Sources:** Emerging technologies such as wearable sensors, smartphone tracking, and social media analytics offer new ways to collect data from participants who may disengage from traditional studies. When used ethically, these tools can reduce attrition and improve representativeness.

5. **Qualitative Research on Dropout:** Future studies should explore why participants disengage, using interviews or case studies to gain insight into barriers to retention. Understanding dropout as a psychological and sociocultural phenomenon can inform more human-centered study designs.

6. **Meta-Analyses of Survivorship Bias Effects:** Field-wide meta-analyses should quantify the magnitude of survivorship bias across various domains, helping to establish benchmarks for acceptable dropout and non-response rates in different study types.

5. Conclusion

Survivorship bias represents a pervasive and consequential threat to the integrity of psychological science. This systematic review of 20 empirical studies illustrates how research across mental health, cognitive aging, epidemiology, and resilience is routinely skewed by selective retention, participant dropout, and non-response. These biases not only distort empirical findings but also impact the development of theory, the implementation of evidence-based practices, and the formulation of public health policies.

Despite growing awareness, few studies rigorously confront survivorship bias in design, analysis, or interpretation. This gap highlights the need for stronger methodological standards, better retention strategies, and more inclusive sampling practices in psychological research.

Addressing survivorship bias is not just a methodological challenge, it is a scientific and ethical imperative. To produce knowledge that is truly valid, inclusive, and applicable, psychological researchers must commit to recognizing and correcting for this hidden but potent form of bias.

References

- Adams, M. J., Hill, W. D., Howard, D. M., Dashti, H. S., Davis, K. A. S., Campbell, A., Clarke, T. K., Deary, I. J., Hayward, C., Porteous, D., Hotopf, M., & McIntosh, A. M. (2020). Factors associated with sharing e-mail information and mental health survey participation in large population cohorts. *International Journal of Epidemiology*, 49(2), 410-421. <https://doi.org/10.1093/ije/dyz134>
- Batabyal, S. (2021). COVID-19: Perturbation dynamics resulting chaos to stable with seasonality transmission. *Chaos, Solitons & Fractals*, 145, 110772. <https://doi.org/10.1016/j.chaos.2021.110772>
- Batabyal, S., & Batabyal, A. (2021). Mathematical computations on epidemiology: A case study of the novel coronavirus (SARS-CoV-2). *Theory in Biosciences*, 140(1), 101-110. <https://doi.org/10.1007/s12064-021-00339-5>
- Bhamra, R. (2019). Resilience in the context of psychological research: A review and analysis. *International Journal of Psychology*, 54(4), 439-448.
- Boldrini, M., Canoll, P. D., & Klein, R. S. (2021). How COVID-19 affects the brain. *JAMA Psychiatry*, 78(6), 682-683. <https://doi.org/10.1001/jamapsychiatry.2021.0500>
- Bonati, M., Campi, R., Zanetti, M., Cartabia, M., Scarpellini, F., Clavenna, A., & Segre, G. (2021). Psychological distress among Italians during the 2019 coronavirus disease (COVID-19) quarantine. *BMC Psychiatry*, 21, 20. <https://doi.org/10.1186/s12888-020-03027-8>
- Browning, M. H. E. M., Larson, L. R., Sharaievska, I., Rigolon, A., McAnirlin, O., Mullenbach, L., Cloutier, S., Vu, T. M., Thomsen, J., Reigner, N., Metcalf, E. C., D'Antonio, A., Helbich, M., Bratman, G. N., & Alvarez, H. O. (2021). Psychological impacts from COVID-19 among university students: Risk factors across seven states in the United States.

PLOS ONE, 16(1), e0245327.<https://doi.org/10.1371/journal.pone.0245327>

Centers for Disease Control and Prevention. (2020). Indicators of anxiety or depression based on reported frequency of symptoms during the last 7 days. Household Pulse Survey.

Corry, N. H., Williams, C. S., Battaglia, M., McMaster, H. S., & Stander, V. A. (2017). Assessing and adjusting for non-response in the Millennium Cohort Family Study. *BMC Medical Research Methodology*, 17(1), 16.<https://doi.org/10.1186/s12874-017-0294-8>

Cornish, R. P., Macleod, J., Boyd, A., & Tilling, K. (2021). Factors associated with participation over time in the Avon Longitudinal Study of Parents and Children: A study using linked education and primary care data. *International Journal of Epidemiology*, 50(1), 293-302.<https://doi.org/10.1093/ije/dyaa192>

Czeisler, M. É., et al. (2020a). Mental health, substance use, and suicidal ideation during the COVID-19 pandemic - United States, June 24-30, 2020. *Morbidity and Mortality Weekly Report*, 69(32), 1049-1057.<https://doi.org/10.15585/mmwr.mm6932a1>

Czeisler, M. É., et al. (2020b). Public attitudes, behaviors, and beliefs related to COVID-19, stay-at-home orders, nonessential business closures, and public health guidance - United States, New York City, and Los Angeles, May 5-12, 2020. *Morbidity and Mortality Weekly Report*, 69(24), 751-758.<https://doi.org/10.15585/mmwr.mm6924e1>

Ettman, C. K., Abdalla, S. M., Cohen, G. H., Sampson, L., Vivier, P. M., & Galea, S. (2020). Prevalence of depression symptoms in US adults before and during the COVID-19 pandemic. *JAMA Network Open*, 3(9), e2019686.

<https://doi.org/10.1001/jamanetworkopen.2020.19686>

Espie, C. A., Kyle, S. D., Hames, P., Gardani, M., Fleming, L., & Cape, J. (2014). The Sleep Condition Indicator: A clinical screening tool to evaluate insomnia disorder. *BMJ Open*, 4(3), e004183.<https://doi.org/10.1136/bmjopen-2013-004183>

Fancourt, D., Steptoe, A., & Bu, F. (2020). Trajectories of anxiety and depressive symptoms during enforced isolation due to COVID-19 in England: A longitudinal observational study. *The Lancet Psychiatry*, 7(12), 1005-1011.

Griffith, G. J., Morris, T. P., Tudur Smith, C., & Tan, P. S. (2016). Bias in meta-analyses due to selective inclusion of trial results: A comparison of methods. *Journal of Clinical Epidemiology*, 80, 79-88.

Herbert, R. J., & Berkowitz, R. L. (1992). Long-term follow-up in clinical studies: Challenges and guidelines. *Journal of Clinical Epidemiology*, 45(3), 235-240.

Holmes, E. A., et al. (2020). Multidisciplinary research priorities for the COVID-19 pandemic: A call for action for mental health science. *The Lancet Psychiatry*, 7(6), 547-560.[https://doi.org/10.1016/S2215-0366\(20\)30168-1](https://doi.org/10.1016/S2215-0366(20)30168-1)

Infante-Rivard, C., & Cusson, A. (2018). Reflection on modern methods: Selection bias-a review of recent developments. *International Journal of Epidemiology*, 47(5), 1714-1722.

<https://doi.org/10.1093/ije/dyy138>

- Kigawa, M., Tsuchiya, Y., Matsumura, K., & Hamazaki, K. (2019a). Association between non-response and health status in a Japanese longitudinal perinatal study. *Environmental Health and Preventive Medicine*, 24(1), 72.
- Kigawa, M., Tsuchiya, Y., Matsumura, K., & Hamazaki, K. (2019b). Reasons for non-participation and loss to follow-up in a longitudinal cohort study of pregnant women. *Environmental Health and Preventive Medicine*, 24(1), 61.
- Lamers, F., Hoogendoorn, A. W., Smit, J. H., van Dyck, R., Zitman, F. G., Nolen, W. A., & Penninx, B. W. J. H. (2012). Sociodemographic and psychiatric determinants of attrition in the Netherlands Study of Depression and Anxiety (NESDA). *Comprehensive Psychiatry*, 53(1), 63-70. <https://doi.org/10.1016/j.comppsy.2011.01.011>
- Lee, B. K., Lessler, J., & Stuart, E. A. (2011). Weight trimming and propensity score weighting. *PLOS ONE*, 6(3), e18174. <https://doi.org/10.1371/journal.pone.0018174>
- Li, H., Cao, Y., & Zhang, H. (2020). Digital mental health and COVID-19: Using social media to assess the impact of lockdown and identify potential targets for intervention. *Journal of Affective Disorders*, 282, 1105-1110.
- Löwe, B., Spitzer, R. L., Gräfe, K., Kroenke, K., Quenter, A., Zipfel, S., Buchholz, C., Witte, S., & Herzog, W. (2004). Comparative validity of three screening questionnaires for DSM-IV depressive disorders and physicians' diagnoses. *Journal of Affective Disorders*, 78(2), 131-140. [https://doi.org/10.1016/S0165-0327\(02\)00237-9](https://doi.org/10.1016/S0165-0327(02)00237-9)
- Mayeda, E. R., Glymour, M. M., Quesenberry, C. P., & Whitmer, R. A. (2018). Inequalities in dementia incidence between six racial and ethnic groups over 14 years. *Alzheimer's & Dementia*, 14(5), 589-597.
- Mayeda, E. R., Tchetgen Tchetgen, E. J., Power, M. C., Sparrow, D., Vokonas, P. S., & Glymour, M. M. (2019). A simulation platform for quantifying survival bias: An application to research on cognitive decline. *American Journal of Epidemiology*, 188(5), 933-942.
- Page, M. J., et al. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *BMJ*, 372, n71. <https://doi.org/10.1136/bmj.n71>
- Perlis, R. H., et al. (2021). Persistence of depression and anxiety symptoms in the United States: Estimates from a nationally representative survey. *Journal of Psychiatric Research*, 139, 103-108.
- Plous, S. (1993). *The psychology of judgment and decision making*. McGraw-Hill. <https://doi.org/10.1037/e412982005-012>
- Ramsey, S. D., et al. (2019). Prognostic stratification tools in cancer: Are we ready for prime time? *JNCI Monographs*, 2019(53), lgz012.
- Roux, L., Chisholm, D., & Levin, C. (2020). Cost effectiveness analysis of interventions for mental health: Challenges, opportunities and recommendations. *Current Opinion in Psychiatry*, 33(5), 520-527.
- 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>

Simmons, J. P., Nelson, L. D., & Simonsohn, U. (2011). False-positive psychology: Undisclosed flexibility in data collection and analysis allows presenting anything as significant. *Psychological Science*, 22(11), 1359-1366.

<https://doi.org/10.1177/0956797611417632>

Sjölander, A. (2014). Propensity scores and M-structure. *Statistics in Medicine*, 33(27), 4843-4858. <https://doi.org/10.1002/sim.6278>

Taguet, A., Vuotto, F., Gouel-Chéron, A., Morand, A., Pommier, T., Richard, J. C., Dequin, P. F., & Constantin, J. M. (2021a). Psychiatric disorders in COVID-19 survivors: A case-control study. *Journal of Affective Disorders*, 294, 264-270.

Taguet, A., Vuotto, F., Morand, A., & Constantin, J. M. (2021b). Neurological and psychiatric outcomes of COVID-19: The hidden burden of the pandemic. *Journal of Neurology*, 268(12), 4485-4491.