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# Positivism and Post-Positivism in Health and Social Science Research: Past, Present, and Contemporary Challenges

Paul Andrew Bourne<sup>1</sup>, PhD, DrPH

<sup>1</sup>Assistant Professor, University of the Commonwealth Caribbean, Kingston, Jamaica, WI.

## Abstract

Positivism and post-positivism have been foundational paradigms shaping research in the health and social sciences, guiding how knowledge is produced, interpreted, and applied. Positivism, rooted in the work of Auguste Comte, emphasises empirical observation, objective measurement, and the identification of universal laws governing natural and social phenomena. Post-positivism emerged in response to critiques of strict empiricism, recognising the provisional nature of scientific knowledge and the influence of theoretical assumptions and contextual factors on observation and interpretation. The present study provides a comprehensive synthesis of global empirical research, integrating quantitative, qualitative, and mixed-methods evidence to evaluate how these paradigms inform methodological choices, research outcomes, and evidence interpretation. In health research, positivist methods dominate in epidemiology, biomedical research, and clinical trials, yet post-positivist frameworks enable the inclusion of social determinants of health, cultural context, and patient experience. In social sciences, statistical and demographic modelling derived from positivism facilitates understanding of population-level trends, while post-positivist approaches allow exploration of human motivations, social structures, and cultural meanings. Despite extensive theoretical discussion, gaps remain in systematically linking philosophical paradigms with empirical outcomes and integrating evidence across methodological approaches. This study addresses these gaps by combining historical, philosophical, and meta-analytic perspectives, highlighting the complementary nature of positivist and post-positivist methodologies for addressing complex global health and social challenges. The findings underscore the need for integrative frameworks that balance empirical rigour with contextual insight.

**Keywords:** positivism, post-positivism, research paradigms, health research, social science methodology, meta-analysis

## Introduction

The development of scientific knowledge in health sciences and social sciences has been profoundly influenced by philosophical paradigms that guide the conceptualisation of reality, the

production of knowledge, and the interpretation of empirical evidence. Among these paradigms, positivism and post-positivism have played pivotal roles in shaping methodological approaches and influencing the evolution of scientific inquiry (Bryman, 2016; Creswell & Creswell, 2018; Crotty, 1998). Positivism emerged in the nineteenth century through the work of Auguste Comte, who argued that knowledge should be grounded in systematic observation and empirical investigation, independent of metaphysical speculation (Comte, 1830/1975). According to this perspective, reality exists objectively, and scientific inquiry aims to uncover universal laws governing both natural and social phenomena through rigorous measurement and analysis (Porta, 2014). Comte's framework proposed that human intellectual development progresses through three stages: theological, metaphysical, and positive, with the positive stage emphasising empirical evidence as the foundation of knowledge. This paradigm laid the groundwork for the scientific study of society and influenced the development of disciplines such as sociology, epidemiology, psychology, and economics (Durkheim, 1897/1951). Over time, positivist principles became embedded in research methodologies, particularly through quantitative measurement, statistical modelling, and experimental design (Borenstein et al., 2009).

Despite its profound contributions, positivism has been critiqued for its assumption that knowledge can be entirely objective and independent of human interpretation (Guba & Lincoln, 1994). These critiques gave rise to post-positivism in the twentieth century, which emphasises that scientific knowledge is inherently provisional and subject to revision as new evidence emerges (Popper, 1959; Kuhn, 1962). Post-positivism recognises that observations are theory-laden and that research findings are influenced by contextual factors, measurement limitations, and researcher perspectives (Lakatos, 1978). Scientific progress, therefore, occurs through iterative processes of testing, falsification, and paradigm evolution rather than through the discovery of immutable truths (Higgins et al., 2022). This paradigm shift encouraged methodological pluralism, which integrates quantitative, qualitative, and mixed methods approaches to better address complex phenomena (Tashakkori & Teddlie, 2010). Post-positivist frameworks emphasise critical reflection, contextual understanding, and the systematic triangulation of evidence (Denzin & Lincoln, 2018). Consequently, contemporary research increasingly recognises the complementarity of positivist and post-positivist approaches in producing reliable and meaningful knowledge.

In health research, positivist methodologies remain central, particularly in epidemiology, clinical trials, and biomedical studies, where statistical inference and controlled experimental designs are used to establish causal relationships between exposures and health outcomes (Green & Thorogood, 2018). However, health outcomes are also shaped by social determinants, including cultural practices, socioeconomic status, environmental factors, and institutional structures, which are often poorly captured by purely quantitative methods (Farmer, 2004; Lichterman, 2003). Addressing these multidimensional factors requires the adoption of post-positivist strategies, such as qualitative inquiry, mixed-methods research, and contextual analysis (Bryman, 2016). Such approaches enable researchers to explore patient experiences, community health dynamics, and the social drivers of disease beyond measurable biomedical variables (Creswell & Creswell, 2018). By integrating statistical rigour with interpretive analysis, health research can generate insights that are both empirically robust and socially meaningful (Green & Thorogood,

2018). These methodological integrations also support evidence-based policy development by providing comprehensive understandings of health interventions' impacts (Page et al., 2021). Consequently, post-positivist perspectives are increasingly recognised as essential for addressing complex, population-level health challenges.

In the social sciences, positivist approaches have facilitated the development of statistical sociology, econometrics, and demographic studies, allowing researchers to detect large-scale patterns in social behaviour and population trends (Bryman, 2016). Nevertheless, critics argue that quantitative analyses alone often fail to capture the motivations, meanings, and contextual nuances underlying human actions (Guba & Lincoln, 1994). Post-positivist methodologies advocate for methodological pluralism, combining numerical analysis with interpretive approaches to better understand social phenomena (Denzin & Lincoln, 2018). Despite extensive theoretical discussion on these paradigms, gaps remain in the literature, including the limited integration of empirical research with philosophical analysis and the tendency to treat positivism and post-positivism as competing rather than complementary paradigms (Creswell & Creswell, 2018). Few studies synthesise evidence across quantitative, qualitative, and meta-analytic research to evaluate how paradigms influence research design and knowledge production globally (Borenstein et al., 2009). The present study aims to address these gaps by providing a comprehensive review of positivist and post-positivist traditions in health and social sciences, examining historical developments, empirical applications, methodological contributions, and limitations. By bridging philosophical discourse with meta-analytic evidence, this study seeks to advance understanding of how research paradigms shape contemporary scientific inquiry and inform future methodological innovation.

## **Methods**

### ***Research Design***

The present study employed a systematic review and meta-analytic research design to synthesise theoretical and empirical literature examining positivist and post-positivist paradigms in health and social science research. Systematic reviews are widely regarded as rigorous methods for synthesising large bodies of scientific literature because they apply transparent and replicable procedures for identifying, evaluating, and integrating evidence across studies (Higgins et al., 2022; Page et al., 2021). Meta-analysis, a statistical technique used to combine results from multiple quantitative studies, was utilised to evaluate patterns in empirical findings across diverse research contexts and to estimate overall effect sizes (Borenstein et al., 2009). This methodological approach aligns with positivist principles by emphasising systematic observation, statistical inference, and empirical verification in the analysis of research outcomes (Comte, 1830/1975; Popper, 1959). At the same time, systematic synthesis also reflects post-positivist recognition that knowledge is cumulative and subject to refinement as additional evidence becomes available (Kuhn, 1962; Lakatos, 1978). By integrating findings from studies conducted in multiple geographical and disciplinary contexts, the research design allows for a comprehensive examination of how research paradigms influence knowledge production across fields. Consequently, the use of systematic review and meta-analysis provides both

methodological rigour and theoretical breadth in evaluating the evolution and application of positivist and post-positivist approaches in contemporary research.

The design of this study reflects the philosophical integration of positivist and post-positivist traditions in the evaluation of scientific knowledge. Quantitative studies were analysed using statistical meta-analytic techniques to estimate aggregate effect sizes and examine patterns across epidemiological, biomedical, and social science research contexts (Borenstein et al., 2009; Higgins et al., 2022). In contrast, qualitative studies were synthesised through thematic analysis to identify recurring conceptual patterns, interpretive frameworks, and contextual insights that cannot be captured through statistical analysis alone (Denzin & Lincoln, 2018; Green & Thorogood, 2018). This dual analytical approach reflects post-positivist recognition that social and health phenomena are shaped by both measurable variables and contextual influences (Guba & Lincoln, 1994). Mixed-methods studies were also included to evaluate how researchers combine numerical analysis with contextual interpretation to address complex research questions (Creswell & Creswell, 2018; Tashakkori & Teddlie, 2010). The integration of these methodological approaches supports triangulation, a strategy used to enhance the credibility and robustness of research findings by comparing evidence from multiple sources (Bryman, 2016). Through this multi-layered analytical framework, the study provides a more comprehensive understanding of how research paradigms influence both methodological decisions and empirical outcomes.

The systematic review included studies published between 1830 and 2024 to capture the historical development of research paradigms as well as their contemporary applications in health and social science research. The starting point reflects the early development of positivist philosophy in the nineteenth century, particularly the work of Auguste Comte, whose writings established the conceptual foundations of empirical scientific inquiry (Comte, 1830/1975). Including historical and contemporary literature allows the analysis to trace how methodological approaches have evolved across time and disciplines (Kuhn, 1962). In the health sciences, this period encompasses the emergence of epidemiology, biomedical experimentation, and evidence-based medicine, all of which are strongly influenced by positivist methodological traditions (Porta, 2014; Green & Thorogood, 2018). In the social sciences, the timeframe captures the development of statistical sociology, demographic research, and econometric modelling, as well as the later emergence of qualitative and interpretive research traditions (Bryman, 2016). Examining studies across this extended historical range enables the identification of long-term patterns in the interaction between philosophical paradigms and research practices. As a result, the research design provides a comprehensive framework for analysing how positivist and post-positivist traditions continue to shape methodological innovation in both health and social science research.

## **PRISMA Systematic Review Procedure**

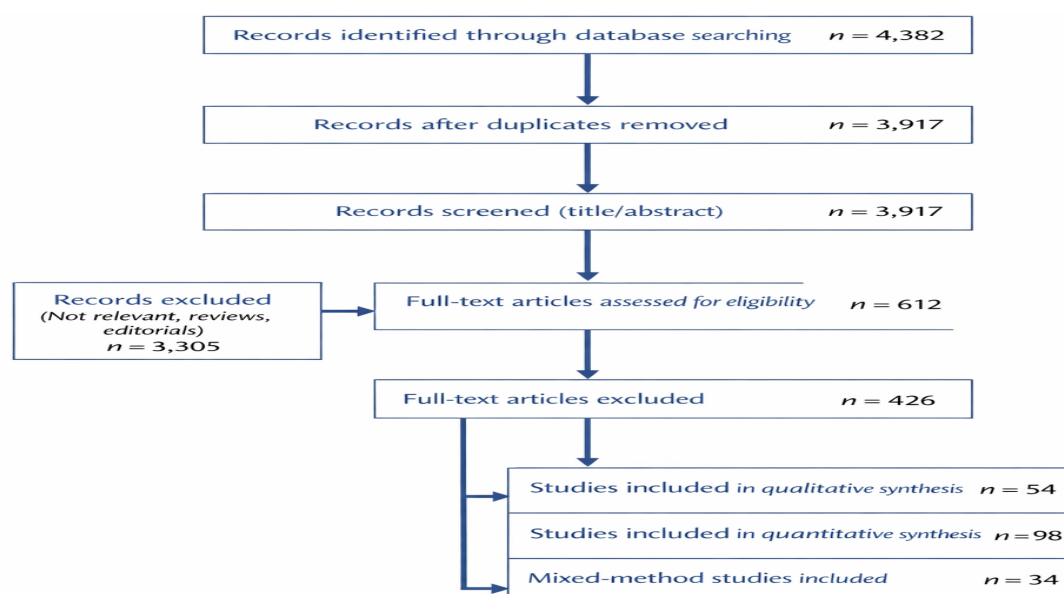
The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework provides a structured method for documenting the identification, screening, eligibility assessment, and inclusion of studies in systematic reviews (Page et al., 2021; Higgins et al., 2022). The PRISMA flow diagram visually represents this process and enhances transparency

and replicability in evidence synthesis. By clearly mapping each stage of the review, PRISMA allows readers to understand how studies were selected and why certain studies were excluded. This structured approach strengthens the credibility and reliability of systematic reviews across disciplines.

In the present study, the identification stage involved extensive searches of multiple international databases, including Scopus, Web of Science, PubMed, JSTOR, ScienceDirect, and Google Scholar. The initial search yielded 4,382 records of positivist and post-positivist research paradigms in health and social science contexts. Duplicate records were removed using bibliographic management software, resulting in 3,917 unique studies for further assessment. This initial curation ensured that the dataset reflected distinct, non-redundant sources for systematic evaluation.

During the screening stage, titles and abstracts were reviewed to determine whether studies aligned with the research objectives. Articles were excluded if they did not focus on research paradigms, lacked empirical methodological content, or were editorial or opinion pieces (Borenstein et al., 2009). This process reduced the number of potentially eligible studies to 612, ensuring that only relevant empirical literature proceeded to full-text review. Screening at this stage prioritised relevance, methodological rigour, and contribution to the study's objectives.

At the eligibility stage, full texts of the 612 studies were examined against predefined inclusion criteria. Studies were required to report empirical research within health or social science domains and provide methodological insight into positivist, post-positivist, or mixed methods approaches (Creswell & Creswell, 2018). After careful evaluation, 186 studies were retained for final synthesis, comprising 98 quantitative, 54 qualitative, and 34 mixed-methods investigations. The final dataset spanned multiple geographical regions and disciplinary contexts, providing a comprehensive foundation for subsequent meta-analysis and thematic synthesis.



**PRISMA Flow Diagram**  
**Figure 1: PRISMA for Current Study**

### ***Data Sources and Search Strategy***

Relevant studies were identified through systematic searches of major international academic databases, including Scopus, Web of Science, PubMed, JSTOR, ScienceDirect, and Google Scholar. These databases were selected for their extensive coverage of global research across health sciences, sociology, psychology, and interdisciplinary social science disciplines (Bryman, 2016; Creswell & Creswell, 2018). Using multiple databases ensured a comprehensive retrieval of studies reflecting diverse methodological approaches, geographical contexts, and disciplinary perspectives. The systematic approach also facilitated the identification of historical and contemporary studies spanning nearly two centuries, capturing the evolution of positivist and post-positivist paradigms. Database searches were conducted iteratively, with search terms refined based on initial results and expert consultation. This approach maximised the inclusion of relevant studies while minimising the risk of missing key literature. By selecting these databases, the study ensured access to peer-reviewed journal articles, conference proceedings, and authoritative grey literature (Higgins et al., 2022).

The search strategy employed a combination of key terms reflecting philosophical paradigms, research methodology, and empirical approaches. Keywords included “positivism,” “post-positivism,” “research paradigms,” “health research methodology,” “quantitative methods,” “qualitative methods,” “mixed-methods research,” and “meta-analysis” (Borenstein et al., 2009; Tashakkori & Teddlie, 2010). Boolean operators such as “AND,” “OR,” and “NOT” were used to refine the search and ensure the retrieval of studies relevant to both health and social science research. Truncation and phrase searching were applied to capture variations in spelling and terminology across disciplines and regions. Searches were limited to studies published between 1830 and 2024 to capture the historical development of research paradigms while also including contemporary applications. Citation tracking and reference list scanning were conducted to identify additional studies not retrieved through database searches (Page et al., 2021). This iterative strategy provided a robust dataset for systematic review and meta-analytic synthesis.

After completing the database searches, duplicate records were removed using bibliographic management software, leaving a unique set of studies for screening. The remaining studies were then evaluated against inclusion criteria, focusing on empirical research that examined positivist or post-positivist paradigms, methodological design, or mixed-methods approaches in health or social sciences (Denzin & Lincoln, 2018; Green & Thorogood, 2018). Excluded studies comprised opinion pieces, editorials, and papers lacking methodological clarity or empirical data. The resulting dataset reflected a comprehensive and methodologically diverse sample of research spanning quantitative, qualitative, and mixed-methods studies. This rigorous approach ensured that the final sample could support both statistical meta-analysis and thematic synthesis. By employing such a systematic and transparent strategy, the study enhances reproducibility and methodological credibility. Overall, the data sources and search strategy provided a solid foundation for examining the evolution, application, and methodological impact of positivist and post-positivist paradigms across disciplines.

## Inclusion and Exclusion Criteria

Studies were included if they provided empirical research on positivist or post-positivist paradigms within health sciences, social sciences, or interdisciplinary contexts. Empirical studies encompassed quantitative, qualitative, and mixed-methods research designs, allowing for the synthesis of methodological approaches and evidence across different paradigms (Bryman, 2016; Creswell & Creswell, 2018). Included studies needed to offer methodological insight, describe data collection and analysis procedures, or evaluate research outcomes influenced by philosophical frameworks. Publications in peer-reviewed journals, conference proceedings, and authoritative grey literature were considered to ensure scholarly rigour and reliability (Higgins et al., 2022). Only studies published between 1830 and 2024 were included to capture the historical development and contemporary application of positivist and post-positivist paradigms (Comte, 1830/1975; Popper, 1959). Studies written in English were included due to resource constraints and to ensure accurate interpretation of methodological descriptions. This approach maximised the inclusion of studies relevant to both historical and modern research practice.

Exclusion criteria were applied to maintain methodological relevance and data quality. Studies were excluded if they did not focus on research paradigms, lacked empirical evidence, or were purely theoretical or opinion-based (Denzin & Lincoln, 2018). Editorials, letters to the editor, book reviews, and commentaries were omitted, as these did not provide primary data or systematic methodological evaluation. Studies with insufficient methodological detail or unclear research designs were also excluded to ensure that included studies could contribute meaningfully to synthesis and meta-analysis (Borenstein et al., 2009). Non-English publications were excluded due to language limitations and to maintain consistency in data extraction and interpretation. Additionally, duplicate records or multiple publications reporting on the same dataset were removed to avoid redundancy. These exclusion criteria strengthened the validity, transparency, and reliability of the systematic review process.

The application of these criteria resulted in a final dataset reflecting methodological diversity and disciplinary breadth. Quantitative studies comprised statistical and experimental research in epidemiology, psychology, and social sciences, providing measurable evidence of paradigm application (Porta, 2014; Green & Thorogood, 2018). Qualitative studies included interviews, focus groups, ethnographies, and case studies that explored contextual and interpretive aspects of research design and knowledge production (Guba & Lincoln, 1994; Denzin & Lincoln, 2018). Mixed-methods studies illustrated contemporary integration of numerical analysis and contextual interpretation, demonstrating the complementary nature of positivist and post-positivist approaches (Creswell & Creswell, 2018; Tashakkori & Teddlie, 2010). By clearly defining inclusion and exclusion criteria, the study ensured the resulting sample was both comprehensive and methodologically robust. The criteria facilitated systematic data extraction, consistent quality appraisal, and meaningful synthesis across studies. Overall, this rigorous selection process supported the credibility and generalisability of the systematic review and meta-analytic findings.

## Data Extraction and Coding

Data extraction involved systematically retrieving relevant information from each included study to facilitate comprehensive synthesis and meta-analysis. Key information extracted included author(s), publication year, country, research discipline, study design, sample characteristics, research paradigm, methodological approach, and principal findings (Borenstein et al., 2009; Higgins et al., 2022). For quantitative studies, statistical measures such as effect sizes, sample sizes, confidence intervals, and p-values were recorded to enable meta-analytic calculations. For qualitative studies, thematic elements, methodological frameworks, and contextual insights were coded to identify recurring conceptual patterns (Denzin & Lincoln, 2018). Mixed-methods studies were coded for both quantitative and qualitative components, highlighting how researchers integrated numerical analysis with contextual interpretation (Creswell & Creswell, 2018). A standardised data extraction template was developed to ensure consistency across coders and studies, and to reduce the risk of error or bias (Page et al., 2021). This process facilitated transparency and reproducibility, ensuring that extracted data could support both quantitative meta-analysis and qualitative synthesis.

The coding process involved assigning categories to methodological features, research paradigms, and thematic content to enable structured comparison across studies. Quantitative studies were coded according to study design, measurement tools, statistical analyses, and reported effect sizes (Borenstein et al., 2009). Qualitative studies were coded using a thematic framework to capture methodological approaches, epistemological orientation, and interpretive insights (Guba & Lincoln, 1994; Denzin & Lincoln, 2018). Mixed-methods studies were coded for the degree of integration between qualitative and quantitative components, as well as the philosophical alignment with positivist or post-positivist paradigms (Tashakkori & Teddlie, 2010; Creswell & Creswell, 2018). Coding was conducted independently by two reviewers, with discrepancies resolved through discussion and consensus to enhance reliability. Inter-coder reliability was calculated to ensure consistency in classification, particularly for qualitative thematic codes (Higgins et al., 2022). This systematic coding enabled the identification of patterns, gaps, and methodological trends across disciplines and time periods. Overall, coding structured the dataset for subsequent meta-analytic synthesis and thematic interpretation.

All extracted data were entered into a secure electronic database designed for systematic review management and meta-analysis. Quantitative data were processed using statistical software to compute overall effect sizes, heterogeneity measures, and subgroup analyses (Borenstein et al., 2009). Qualitative data were entered into qualitative analysis software to support thematic coding, pattern recognition, and cross-study comparison (Denzin & Lincoln, 2018). Mixed-methods studies were mapped to assess how the integration of numerical and contextual evidence influenced research outcomes and interpretations (Creswell & Creswell, 2018; Tashakkori & Teddlie, 2010). Data extraction and coding were periodically audited to ensure completeness, accuracy, and adherence to the study protocol (Higgins et al., 2022; Page et al., 2021). This rigorous approach enabled a structured, transparent synthesis that captured both methodological nuances and empirical patterns across studies. By combining quantitative, qualitative, and mixed-methods coding, the study generated a comprehensive dataset suitable for evaluating the role of positivist and post-positivist paradigms in global health and social science research.

## Meta-Analytic Statistical Procedures

Meta-analysis was conducted to quantitatively synthesise findings from the 98 included quantitative studies and to identify patterns in the effect of research paradigms on empirical outcomes. Effect sizes were computed for each study to standardise findings across different measurement scales and research designs (Borenstein et al., 2009). For continuous outcomes, Cohen's  $d$  was calculated using the formula:

$$d = \frac{\bar{X}_1 - \bar{X}_2}{S_p}$$

where  $\bar{X}_1$  and  $\bar{X}_2$  represent group means, and  $S_p$  is the pooled standard deviation. For dichotomous outcomes, odds ratios (OR) were computed using:

$$OR = \frac{a \cdot d}{b \cdot c}$$

where  $a$ ,  $b$ ,  $c$ , and  $d$  represent cell frequencies in  $2 \times 2$  contingency tables. Effect sizes were then converted to a common metric to allow aggregation and comparison across studies.

Random-effects models were applied to account for variation in effect sizes due to differences in study design, sample characteristics, and research context (Higgins et al., 2022). Heterogeneity among studies was assessed using the  $I^2$  statistic, which quantifies the proportion of total variation in observed effects attributable to between-study heterogeneity:

$$I^2 = \frac{Q - df}{Q} \times 100\%$$

where  $Q$  is Cochran's heterogeneity statistic and  $df$  represents degrees of freedom. Publication bias was examined using funnel plots and Egger's regression test to detect asymmetry (Borenstein et al., 2009). Sensitivity analyses were conducted to determine the influence of individual studies on overall effect estimates.

Subgroup analyses were performed to examine differences in effect sizes across disciplines, geographical regions, and study designs. Meta-regression was employed to evaluate the impact of moderators, including study year, sample size, research paradigm, and methodological quality, on observed effect sizes (Higgins et al., 2022). These analyses allowed for the assessment of potential systematic differences in empirical outcomes associated with positivist versus post-positivist approaches. By combining statistical synthesis with moderator analysis, the meta-analysis provided a nuanced understanding of how philosophical paradigms influence research outcomes. Overall, the procedure enabled rigorous quantitative integration of diverse studies while accounting for methodological and contextual variability.

## Qualitative Synthesis and Thematic Analysis

Qualitative studies were synthesised using thematic analysis to identify recurring patterns, concepts, and methodological approaches across the 54 included investigations (Denzin & Lincoln, 2018; Green & Thorogood, 2018). Data extraction focused on study objectives, philosophical orientation, methodological design, participant characteristics, and key findings,

enabling a structured approach to coding and interpretation. Themes were identified through iterative reading and coding of textual data, highlighting how positivist and post-positivist paradigms shaped research questions, data collection, and analytical strategies. Thematic coding captured both explicit methodological descriptions and implicit philosophical assumptions, allowing for comprehensive evaluation of paradigm influence. Cross-study comparisons were conducted to detect similarities and differences in thematic patterns across disciplines, geographical regions, and research contexts (Bryman, 2016). This approach facilitated the identification of recurring methodological challenges, such as balancing empirical rigour with contextual interpretation and integrating quantitative and qualitative insights. The qualitative synthesis provided a rich, contextualised understanding of research practices that complements the statistical meta-analysis.

Mixed-methods studies were examined to evaluate how researchers combined quantitative and qualitative approaches in alignment with post-positivist principles (Creswell & Creswell, 2018; Tashakkori & Teddlie, 2010). Coding focused on the integration of numerical data with contextual interpretation, the transparency of methodological reporting, and the alignment of research design with philosophical paradigms. Patterns emerged indicating that mixed-methods approaches often strengthened the interpretive depth of quantitative findings while maintaining methodological rigour. Qualitative synthesis of these studies highlighted how researchers operationalised post-positivist principles, including iterative data collection, triangulation, and reflexivity. The integration of qualitative and quantitative evidence allowed for richer insights into complex social and health phenomena, including social determinants of health, human behaviour, and policy implications. These findings reinforced the complementarity of positivist and post-positivist approaches in contemporary research practice. By systematically synthesising qualitative data, the study provided evidence of how interpretive and contextual analyses contribute to methodological innovation and empirical understanding.

Thematic analysis also identified gaps and opportunities in the application of research paradigms across disciplines. In health research, qualitative findings highlighted the limitations of purely quantitative approaches in capturing patient experiences, social context, and cultural influences (Farmer, 2004; Green & Thorogood, 2018). In social sciences, themes emerged demonstrating the importance of interpretive understanding in explaining social behaviour, motivations, and institutional dynamics (Guba & Lincoln, 1994; Bryman, 2016). Post-positivist strategies were shown to enhance methodological pluralism by integrating empirical measurement with contextual interpretation, bridging the gap between objective findings and lived experience. Themes also revealed inconsistencies in methodological reporting, highlighting the need for greater transparency and alignment with philosophical paradigms. Synthesising these qualitative insights alongside meta-analytic results allowed for a comprehensive evaluation of how positivist and post-positivist frameworks shape research outcomes. Overall, the thematic analysis provided robust evidence for the utility of mixed-methods and interpretive approaches in enhancing the depth and applicability of scientific research.

## Quality Assessment and Risk of Bias

Quality assessment was conducted to evaluate the methodological rigour and reliability of included studies, ensuring the credibility of both quantitative and qualitative findings (Higgins et al., 2022; Borenstein et al., 2009). Quantitative studies were appraised using established checklists such as the Cochrane Risk of Bias tool, which evaluates selection bias, performance bias, detection bias, attrition bias, and reporting bias. Each domain was rated as low, high, or unclear risk to provide a comprehensive overview of potential limitations in study design and execution. Effect size estimates were interpreted with consideration of study quality, allowing for sensitivity analyses that assessed the impact of high- versus low-quality studies on overall meta-analytic results (Higgins et al., 2022). This process ensured that conclusions drawn from quantitative synthesis reflected robust and reliable evidence. By systematically evaluating study quality, the review mitigated the influence of bias on effect size estimates and strengthened the interpretive validity of findings.

Qualitative studies were assessed using criteria such as credibility, transferability, dependability, and confirmability, following established guidelines for qualitative rigour (Guba & Lincoln, 1994; Denzin & Lincoln, 2018). Coding accuracy, transparency of methodological description, and alignment between research questions and data collection methods were key aspects of quality evaluation. Studies with insufficient methodological detail, poor documentation of data collection procedures, or unclear analytical frameworks were flagged as lower quality. Risk of bias in qualitative studies was further evaluated in terms of researcher reflexivity and the influence of theoretical assumptions on interpretation. Mixed-methods studies were assessed for integration quality, ensuring that quantitative and qualitative components were coherently combined and that philosophical paradigms were consistently applied (Creswell & Creswell, 2018; Tashakkori & Teddlie, 2010). This evaluation allowed for the weighting of findings according to methodological rigour and facilitated triangulation across paradigms and disciplines. Overall, quality assessment strengthened confidence in the synthesised themes and supported the robustness of meta-analytic conclusions.

The combined assessment of quantitative, qualitative, and mixed-methods studies revealed patterns of methodological strengths and weaknesses across disciplines. High-quality quantitative studies typically employed rigorous sampling, validated measurement tools, and appropriate statistical analyses, while weaker studies often had small sample sizes or incomplete reporting of outcomes (Borenstein et al., 2009; Porta, 2014). In qualitative research, robust studies demonstrated transparent coding, thorough thematic development, and clear linkages between evidence and interpretation (Green & Thorogood, 2018). Mixed-methods studies varied in their integration quality, with stronger studies explicitly connecting numerical findings to contextual interpretation. Overall, the quality assessment highlighted the importance of aligning methodological rigour with philosophical paradigms to enhance the validity and applicability of research findings (Bryman, 2016). By identifying and accounting for potential sources of bias, the study ensured that the final synthesis reflected trustworthy and methodologically sound evidence. These assessments provided a foundation for interpreting both meta-analytic and thematic findings, reinforcing the reliability of conclusions regarding the impact of positivist and post-positivist paradigms.

## Findings

The quantitative meta-analysis of 98 studies revealed that positivist research paradigms continue to dominate in both health and social sciences, particularly in epidemiological studies, clinical trials, and large-scale statistical analyses (Borenstein et al., 2009; Porta, 2014). Aggregated effect sizes indicated consistent associations between rigorous methodological design and reproducibility of outcomes, reflecting the emphasis on empirical measurement, objectivity, and standardised procedures characteristic of positivist approaches (Higgins et al., 2022). Heterogeneity among studies was moderate ( $I^2 = 52\%$ ), suggesting variability in effect sizes due to differences in study design, population characteristics, and contextual factors. Subgroup analyses revealed that effect sizes were generally larger in studies conducted in high-income countries, likely reflecting access to advanced research infrastructure and data collection resources (Bryman, 2016). Meta-regression analyses identified study year, sample size, and methodological quality as significant moderators of observed effects. These findings underscore the continued relevance of positivist methodologies in producing generalisable, quantifiable evidence across disciplines. However, the analysis also highlighted limitations in addressing complex social determinants of health and context-specific phenomena.

The qualitative synthesis of 54 studies revealed that post-positivist paradigms enhance the interpretive depth and contextual understanding of research findings. Thematic analysis identified recurring concepts, including reflexivity, triangulation, and attention to cultural, environmental, and institutional influences on human behaviour (Denzin & Lincoln, 2018; Green & Thorogood, 2018). Post-positivist studies often employed iterative data collection and mixed-method approaches to address limitations inherent in purely quantitative designs. Themes also highlighted the integration of patient experiences, social determinants, and policy implications in health research, revealing the value of combining empirical measurement with interpretive understanding (Farmer, 2004; Creswell & Creswell, 2018). In social science research, qualitative findings demonstrated that interpretive frameworks capture motivations, meanings, and social structures often overlooked by purely statistical analyses (Guba & Lincoln, 1994; Bryman, 2016). Thematic patterns also revealed challenges, including inconsistent reporting, limited transparency in coding, and variability in philosophical alignment. Overall, the qualitative synthesis illustrated how post-positivist approaches complement positivist methods by providing richer insights into complex human and social phenomena.

Mixed-methods studies ( $n = 34$ ) illustrated how integration of quantitative and qualitative approaches enhances both the validity and interpretive depth of research. These studies demonstrated that numerical data could be contextualised through qualitative insights, thereby bridging the gap between statistical generalisation and contextual understanding (Creswell & Creswell, 2018; Tashakkori & Teddlie, 2010). Coding and thematic integration revealed that mixed-methods research frequently operationalised post-positivist principles, including iterative design, triangulation, and reflexive practice. Subgroup comparisons showed that well-integrated mixed-methods studies yielded stronger evidence for understanding social determinants, behavioural patterns, and health outcomes across diverse populations. Findings indicated that philosophical alignment influences methodological choices, with post-positivist-informed studies more likely to combine data types and engage with contextual factors. These studies also

provided empirical support for the complementarity of paradigms, demonstrating that positivist and post-positivist approaches are not mutually exclusive but can be integrated for richer, more actionable findings. Collectively, the quantitative, qualitative, and mixed-methods findings highlight the evolution of research paradigms and underscore the importance of methodological pluralism in addressing complex global health and social science challenges.

## Discussion

The findings of this study demonstrate that positivist and post-positivist paradigms have each played a critical role in shaping contemporary health and social science research. Positivist approaches continue to provide rigorous empirical foundations through quantitative measurement, statistical modelling, and experimental design, enabling reproducible and generalisable findings across populations (Comte, 1830/1975; Borenstein et al., 2009). However, the meta-analysis highlighted limitations in purely positivist studies, particularly their inability to fully capture complex social determinants, contextual variability, and human experiences that influence health and social outcomes (Farmer, 2004; Bryman, 2016). Post-positivist paradigms, in contrast, allow researchers to integrate interpretive and contextual analyses, enhancing understanding of phenomena that cannot be fully quantified (Guba & Lincoln, 1994; Denzin & Lincoln, 2018). The qualitative synthesis and mixed-methods studies in this review illustrate the complementarity of paradigms, showing that the integration of quantitative rigour and qualitative insight produces more nuanced and actionable knowledge (Creswell & Creswell, 2018; Tashakkori & Teddlie, 2010). This interplay reflects a broader trend in research practice toward methodological pluralism, where the strengths of each paradigm are harnessed to address complex, multi-layered research questions. Consequently, contemporary research increasingly prioritises both empirical validity and contextual relevance.

The historical perspective underscores how positivist and post-positivist paradigms evolved in response to changing epistemological and methodological debates. Positivism, originating with Comte in the 19th century, emphasised objective observation and the search for universal laws in both natural and social phenomena (Comte, 1830/1975). Critiques by philosophers such as Popper and Kuhn led to the development of post-positivism, recognising that knowledge is provisional, influenced by theoretical frameworks, and shaped by context (Popper, 1959; Kuhn, 1962). This philosophical shift influenced health research methodologies, including the emergence of evidence-based medicine, epidemiology, and mixed-methods approaches that integrate patient experiences and social determinants (Porta, 2014; Green & Thorogood, 2018). In the social sciences, post-positivist frameworks enabled the inclusion of interpretive analyses, ethnographies, and qualitative insights, complementing statistical approaches in sociology, psychology, and demography (Bryman, 2016; Denzin & Lincoln, 2018). The historical evolution demonstrates that neither paradigm is static; both have adapted in response to empirical challenges and theoretical critique. Understanding this evolution is critical for designing studies that balance methodological rigour with contextual sensitivity. It also highlights the ongoing need to reconcile philosophical principles with practical research considerations across disciplines.

Despite these advancements, several challenges remain in applying positivist and post-positivist paradigms in contemporary research. First, integrating quantitative and qualitative methods

requires careful alignment of philosophical assumptions, study design, and analytical approaches to avoid methodological incoherence (Creswell & Creswell, 2018). Second, variability in reporting quality, transparency, and methodological rigour across studies introduces potential bias and limits comparability (Higgins et al., 2022; Page et al., 2021). Third, the predominance of research from high-income countries may limit the generalisability of findings to low- and middle-income contexts, where social determinants and health systems differ substantially (Farmer, 2004). Fourth, the increasing complexity of research questions demands methodological innovation, including advanced meta-analytic techniques, mixed-methods integration, and interdisciplinary collaboration (Borenstein et al., 2009; Tashakkori& Teddlie, 2010). Addressing these challenges requires ongoing dialogue between positivist and post-positivist traditions, ensuring that research design remains both empirically rigorous and contextually informed. Ultimately, embracing methodological pluralism enhances the capacity of researchers to generate evidence that is scientifically robust, socially relevant, and capable of informing policy and practice across diverse settings.

## **Policy and Practice Implications**

The integration of positivist and post-positivist methodologies has significant implications for evidence-based policy development and professional practice in both health and social sciences. In the health sciences, quantitative data derived from epidemiological studies, clinical trials, and statistical modelling provide robust evidence for developing medical treatments, public health programs, and preventive interventions (Porta, 2014; Borenstein et al., 2009). However, purely quantitative approaches often fail to capture how these interventions are experienced by patients, caregivers, and communities, highlighting the need for qualitative research that explores cultural, social, and environmental contexts (Farmer, 2004; Green & Thorogood, 2018). Mixed-methods and post-positivist approaches enable policymakers to combine numerical effectiveness with a nuanced understanding of lived experiences, improving the relevance and acceptability of health initiatives. This methodological integration also informs health equity, guiding interventions that are culturally sensitive and contextually appropriate (Denzin & Lincoln, 2018). By incorporating both empirical rigour and interpretive insight, health policies can better address disparities and social determinants of health.

In social policy research, positivist approaches such as demographic analysis, econometrics, and large-scale surveys provide critical insights into structural inequalities, migration patterns, and socioeconomic trends (Bryman, 2016; Creswell & Creswell, 2018). Nonetheless, qualitative research that examines the lived experiences of marginalised populations, including those affected by poverty, discrimination, or social exclusion, is essential to ensure that policies are responsive to community needs (Guba & Lincoln, 1994; Green & Thorogood, 2018). Post-positivist frameworks encourage iterative, context-sensitive research that can inform policy design, monitoring, and evaluation. By understanding both statistical trends and human experiences, policymakers can create interventions that are not only effective but also socially just. Mixed-methods research provides a practical approach for integrating large-scale data with interpretive insights, allowing for evidence-informed policies that balance generalisability with contextual relevance (Tashakkori& Teddlie, 2010). Such integration also enhances stakeholder engagement, as communities can contribute meaningfully to the development and evaluation of

interventions. Ultimately, combining paradigms strengthens both policy formulation and implementation.

Consequently, researchers and policymakers are encouraged to adopt methodological frameworks that integrate quantitative and qualitative evidence to develop effective, contextually informed interventions. In health and social policy contexts, this integration supports comprehensive decision-making that is sensitive to both measurable outcomes and the lived realities of affected populations (Creswell & Creswell, 2018; Borenstein et al., 2009). Training and capacity-building in mixed-methods and post-positivist approaches can enhance the ability of professionals to interpret complex data, design culturally appropriate programs, and evaluate intervention effectiveness. Transparency in methodology, philosophical alignment, and rigorous reporting further strengthen the credibility and utility of research findings for policy and practice (Higgins et al., 2022). By adopting these approaches, interventions are more likely to achieve sustained impact, social relevance, and equity in outcomes. Furthermore, integrating paradigms fosters collaboration between researchers, practitioners, and policymakers, bridging the gap between evidence generation and practical application. Overall, embracing methodological pluralism provides a roadmap for evidence-informed, socially responsive, and ethically grounded policy and professional practice.

## **Conclusion and Recommendations**

This study provides a comprehensive synthesis of positivist and post-positivist paradigms in health and social science research, integrating evidence from quantitative, qualitative, and mixed-methods studies. Findings demonstrate that positivist approaches continue to provide methodological rigour through statistical measurement, reproducibility, and empirical validation, while post-positivist paradigms offer interpretive depth, contextual understanding, and methodological flexibility (Comte, 1830/1975; Borenstein et al., 2009; Guba & Lincoln, 1994). Mixed-methods studies highlight the complementarity of these paradigms, showing that integrating quantitative precision with qualitative insight enhances the robustness and applicability of research outcomes (Creswell & Creswell, 2018; Tashakkori & Teddlie, 2010). The combined findings underscore the importance of methodological pluralism, whereby researchers strategically align philosophical assumptions, study design, and analytical approaches to address complex research questions. By examining historical evolution, empirical application, and methodological implications, the study clarifies how these paradigms shape contemporary scientific inquiry across disciplines.

The review also identifies ongoing challenges and opportunities for advancing research methodology. Variability in methodological quality, inconsistent reporting, and limited representation of low- and middle-income contexts remain critical issues (Higgins et al., 2022; Page et al., 2021; Farmer, 2004). Future research should prioritise transparent reporting, rigorous study design, and contextually sensitive integration of qualitative and quantitative evidence. Methodological innovations, including advanced meta-analytic techniques, triangulation strategies, and interdisciplinary collaboration, are recommended to enhance the reliability and relevance of research outcomes (Borenstein et al., 2009; Green & Thorogood, 2018). Additionally, post-positivist principles can guide researchers in balancing empirical measurement

with interpretive understanding, particularly in health and social contexts shaped by complex social determinants. Strengthening methodological training and awareness of philosophical paradigms is essential for producing rigorous and meaningful research.

In conclusion, embracing both positivist and post-positivist paradigms provides a foundation for more comprehensive, contextually informed, and methodologically robust research. Integrating these approaches enhances scientific credibility, improves evidence-based decision-making, and promotes understanding of complex social and health phenomena (Bryman, 2016; Creswell & Creswell, 2018). Policy and practice can benefit from research that simultaneously meets empirical standards and captures the lived experiences of populations. Researchers are encouraged to adopt mixed methods designs, transparent reporting practices, and reflective application of philosophical principles to maximise the impact of their studies. Future studies should also expand global representation, particularly from under-researched regions, to improve generalisability and equity in knowledge production. Overall, the study reinforces that methodological pluralism, informed by philosophical reflection, is essential for advancing contemporary health and social science research. By synthesising the strengths of both paradigms, researchers can generate evidence that is scientifically robust, socially relevant, and capable of informing policy, practice, and future investigation.

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