

## **IMPACT OF BEHAVIORAL BIASES ON INVESTMENT DECISION-MAKING THROUGHOUT PRE-, DURING-, AND POST-COVID-19: A BIBLIOMETRIC LITERATURE REVIEW**

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**Running Head-** Bibliometric analysis of Behavioral biases' impact on decision making throughout the pandemic phases.

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**Abstract:** The COVID-19 pandemic severely affected the global economy, which magnifies the role of behavioral biases in investor decision-making across various phases of the COVID-19 pandemic. This study investigates how these biases hampered investing behavior before, during, and after the pandemic by employing a bibliometric literature review analysis. Drawing 51 peer-reviewed articles sourced from the Scopus database used for citation analysis, prominent keywords, research trends, market- and major-impact behavioral biases. The PRISMA and VOSviewer tools were used to guide the study. The findings show that interest increased significantly between 2020 and 2024, with overconfidence and herding biases being the most prevalent over the study period. Although the pandemic period has garnered considerable academic attention, glaring gaps remain in the body of research on investor behavior pre- and post-pandemic phases. The bibliometric analysis reveals that India is leading studies on the impact of behavioral biases across the phases of the COVID-19 pandemic, with other countries such as China, Saudi Arabia, Malaysia, and Pakistan. Furthermore, the multidisciplinary scope of studies in this area, such as psychology, economics, and finance, has added to the expanding corpus of knowledge. The study proposes future research potential, such as the need for longitudinal studies and more diversified data sources, while emphasizing the global and interdisciplinary character of existing research. These insights are beneficial for researchers, investors, and governments who wish to manage behavioral inclinations during such emergencies.

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**Keywords:** Behavioral biases, Investment decision-making, COVID-19, Bibliometric analysis, Systematic literature review, Herding bias, Overconfidence bias, Investor behavior, Heuristics, Investor psychology.

### **1. INTRODUCTION**

The COVID-19 pandemic, a global health crisis that emerged in late 2020, not only posed significant challenges to public health but also reverberated through economic and financial landscapes worldwide (World Bank, 2022; Fernandez-Perez et al., 2021). The pandemic's unparalleled disruptions have led to the reassessment of long-standing conventions and procedures, especially regarding investment decisions (Wang et al., 2021).

Financial markets experienced unparalleled volatility and uncertainty in the wake of the COVID-19 pandemic (Lisicki, 2023). Investment conditions have become complex as a result of the first waves of shocks that occurred before COVID-19, the dynamic swings that were seen during the pandemic, and the continuous changes that occurred in the aftermath of the virus (Jan et al., 2022; Udoy et al., 2023). In this context, studying behavioral biases is of paramount importance. During economic growth, behavioral biases have a more pronounced impact on investment decision-making. Rational decision-making is frequently compromised by investors' psychological reactions to fear, uncertainty, and rapid market fluctuations (Laungratanamas and Nuangjamnong, 2023; Parveen et al., 2021; Murhadi et al., 2024). Understanding these behavioral biases is essential for deciphering the complexities of investor choices as we navigate pre-, peak-, and post-COVID-19 scenarios. Although COVID-19 has significantly impacted behavioral biases and investment decision-making, not much research has been conducted on this subject since the pandemic.

The existing literature underscores the multifaceted influence of various behavioral factors on investment decision-making (Yadav and Dhaigude, 2023; Armansyah, 2022; Pham and Chu, 2024; Khare and Kapoor, 2023; Ritika et al., 2022; Dita et al., 2023; Afrin et al., 2022). Moreover, a substantial body of research highlights the pronounced impact of behavioral biases on investment decisions, particularly during the unprecedented challenges posed by the COVID-19 pandemic. Specific biases have been meticulously identified within this literature, shedding light on their significant role in shaping investment decisions during different phases of the pandemic (Bharti and Kumar, 2021; Kathpal & Siddiquei, 2021; Kuranchie-Pong & Forson, 2021; Yuwono & Elmadiani, 2021). This collective body of work contributes to a nuanced understanding of how behavioral factors and biases intertwine to mold investor behavior in dynamic and uncertain market environments. Research has found that behavioral biases have a major impact on investment decisions, especially during the challenges presented by the COVID-19 pandemic. Several biases have been identified and studied in the literature, revealing their significant influence on investment decisions during different phases of the pandemic. This body of work helps us better understand how behavioral factors and biases work together to shape investor behavior under challenging and uncertain market conditions (Mnif et al. 2022).

Scholars leverage behavioral theories like prospect and heuristic theory to demonstrate the biases impact on investment decision-making during COVID-19 (Virdikar and Kulkarni, 2022; Shah and Butt, 2024). This enriches our understanding of the complex interplay between behavioral factors and investment choices during the global crisis.

Therefore, the research question of this study is as follows:

*RQ1:* Explore research trends to understand the impact of behavioral biases on investment decision-making across the COVID-19 pandemic phase by analyzing the most influential keywords, authors, and research papers.

*RQ2:* Explore the results of the studies conducted to determine the dominant behavioral biases that impacted the market and identify the research shift across the pre-, during, and post-COVID-19 pandemic.

*RQ3:* To identify the research gap among published studies and future research trends, we used bibliometric analysis and a systematic literature review.

## **1. OBJECTIVE**

This research aims to consolidate the current corpus of information regarding how COVID-19 has affected investment choices and behavioral biases before, during, and after the pandemic. A sample of 51 articles served as the basis for the investigation, which examined citation analysis and used keywords, published trends in journals, market impact, and major behavioral biases. In addition, a methodological literature review procedure was used to thoroughly examine the outcomes of the selected investigations. The study can address potential research directions and trends that ultimately lead to pertinent conclusions. This research offers significant perspectives on the patterns of the impact of behavioral biases on investment choices before, during, and following the COVID-19 pandemic. Scholars, decision-makers, and practitioners involved in behavioral finance find great value in this study's findings.

**2. METHODOLOGY**

**2.1. Literature Search Approach**

For the systematic literature review, the Scopus database was used because it provides a wider coverage of studies. The publication year of the data collection was from 2019 to 2024. The research paper contains the following set of keywords in the title and abstract, and keywords were selected as described in Table 1, such as *Behavioral biases*: Behavioral Bias, Cognitive Bias, Emotional Bias, Heuristic, Overconfidence Bias, Anchoring Bias, Loss Aversion, Disposition Effect, Herding Behavior, Confirmation Bias, Framing Effect. *Investment Decision-making*: Investment Decision, Investor Behavior, Investment Behavior, Financial Decision-Making, Stock Market Decision, Portfolio Management, Risk-taking Behavior, Capital Allocation, and Trading Behavior. The *COVID-19 Context*: COVID-19, Coronavirus, Pandemic, Pre-COVID-19, Post-COVID-19, During COVID-19, Coronavirus Pandemic.

**Table 1. Shows Literature Search Strings In Scopus Database**

<b>KEYWORDS</b>	<p><b>Behavioral Biases-</b> Behavioral Bias, Cognitive Bias, Emotional Bias, Heuristic, Overconfidence Bias, Anchoring Bias, Loss Aversion, Disposition Effect, Herding Behavior, Confirmation Bias, Framing Effect</p> <p><b>Investment Decision-Making-</b> Investment Decision, Investor Behavior, Investment Behavior, Financial Decision-Making, Stock Market Decision, Portfolio Management, Risk-taking Behavior, Capital Allocation, Trading Behavior</p> <p><b>COVID-19 Context-</b> COVID-19, Coronavirus, Pandemic, Pre-COVID-19, Post-COVID-19, During COVID-19, Coronavirus Pandemic.</p>
<b>SEARCH STRINGS</b>	<p>TITLE-ABS-KEY ( ( "Behavioral Bias*" OR "Cognitive Bias*" OR "Emotional Bias*" OR heuristic* OR "Overconfidence Bias" OR "Anchoring Bias" OR "Loss Aversion" OR "Disposition Effect" OR "Herding Behavior" OR "Confirmation Bias" OR "Framing Effect" ) AND ( "Investment Decision*" OR "Investor Behavior" OR "Investment Behavior" OR "Financial Decision-Making" OR "Stock Market Decision*" OR "Portfolio Management" OR "Risk-taking Behavior" OR "Capital Allocation" OR "Trading Behavior" ) AND ( "COVID-19" OR "Coronavirus" OR "Pandemic" OR "Pre-COVID-19" OR "Post-COVID-19" OR "During COVID-19" OR "Coronavirus Pandemic" ) )</p>

**2.2. Inclusion And Exclusion Criteria**

The inclusion and exclusion criteria were used to answer the research question and identify studies that aligned with the research objective. The following table 2 presents a better picture of the adopted criteria:

**Table 2. Inclusion and Exclusion**

<b>Inclusion</b>	<b>Exclusion</b>
This paper focused on Behavioral biases and investment decision making before, during, post- post-COVID-19	Study not related to behavioral biases and investment decision making.
Articles, conference papers	Preprint papers, conference reviews, book chapters
Publish paper (2019-2024)	Papers published before 2019
English	Other than the English language

PRISM criteria were used for this research study. Figure 1 presents the search approach process, such as identification, searching, inclusion and exclusion, and selection of final data for the accomplishment of the research purpose. For the bibliometric analysis, VOSviewer 1.6.20 software was used to map the present trends regarding the research objective.

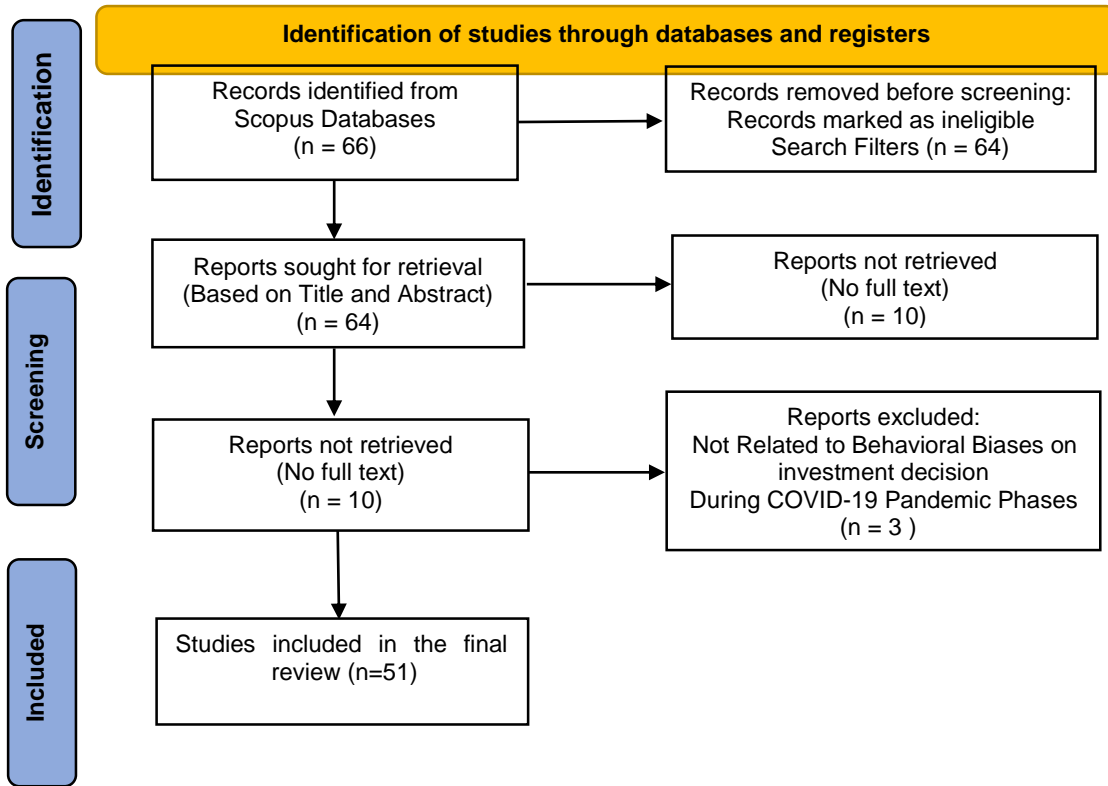


Figure 1. PRISMA 2020 Flow diagram adopted for reporting the search strategy for the study

### 3. RESULT

Figure 2 shows the distribution of research studies published from 2020 to 2024. The graph provides a chronological representation of each year's articles. The highest number of publications in 2024 (data collected until November) compared with the preceding years. The graph represents a significant growth pattern from 2020 to 2024, indicating an increasing focus on understanding the novel coronavirus and its implications in this area of study.

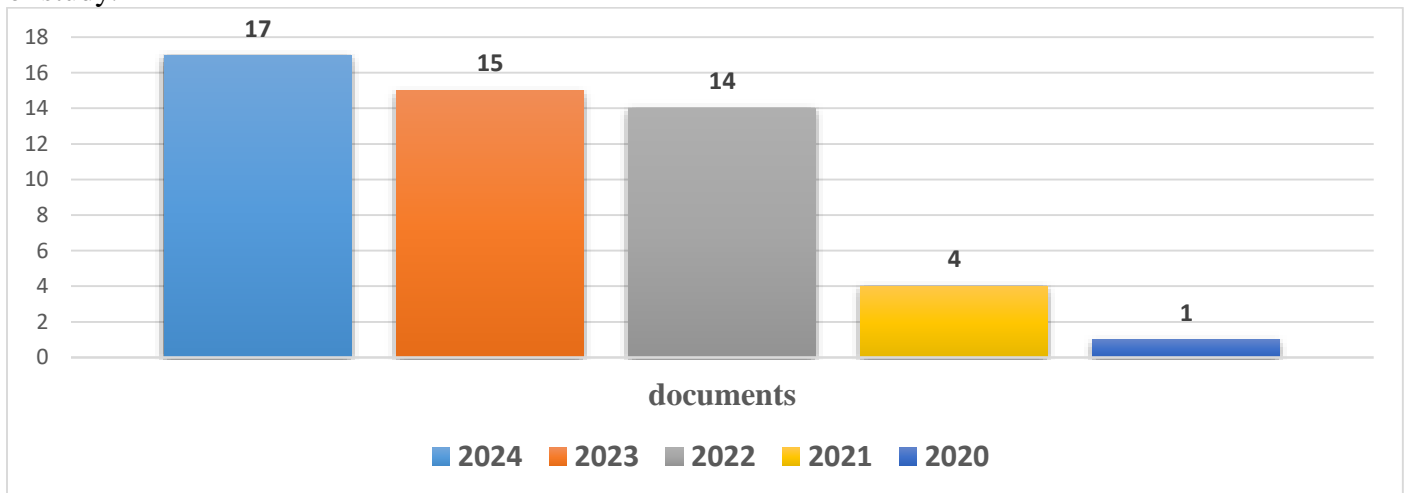


Figure 2. Number of publications per year

#### 4. BIBLIOMETRIC DATA ANALYSIS

##### 4.1. Author Coauthorship Analysis

For the co-author analysis, a specific criterion was set, requiring one document and five citations to assess the relevance of the research. An initial pool of 167 authors, of which 60 met the thresholds. Figure 3 shows the co-authorship relationship between the author and the citation. The result found the highest number of citations of the authors Rosy Dhall, Bhanwar Singh, Amandeep Dhir, Manish Talwar, Shalini Talwar, and Visa Tarjanne. Six authors show the highest link strength: Samreen Fahim Baber, Taqadus Bashir, Shagufta Parveen, Nishat Riaz, Zoya Wajid Satti, and Qazi Abdul Subhan (Dhall & Singh, 2020; Talwar et al., 2021; Parveen et al., 2021c).

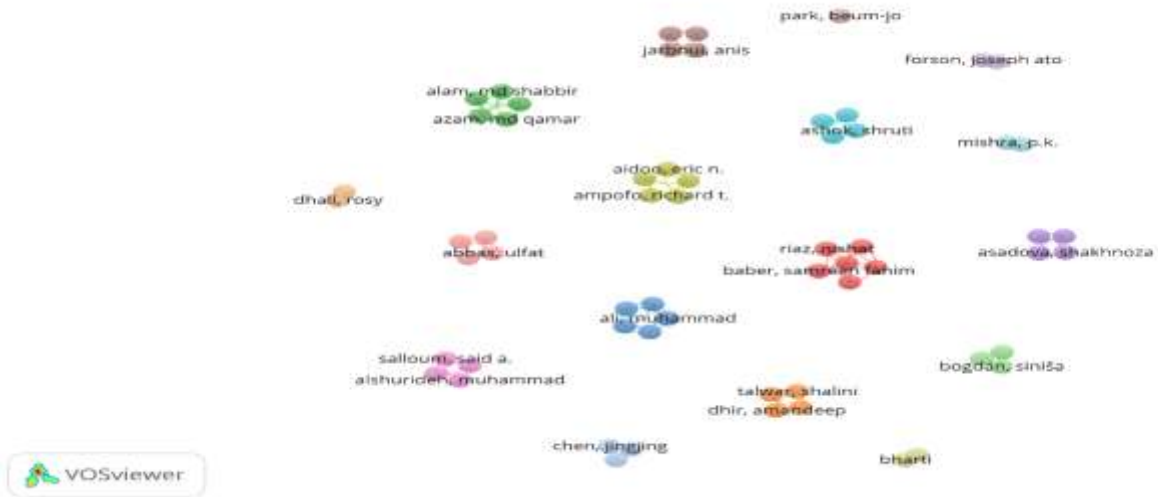


Figure 3. Country Co-Author Analysis

##### 4.2. Country Co-Author Analysis

A country co-authorship analysis was conducted (Figure 4) to highlight the interconnection of research efforts and the global reach of academic work. A total of 39 countries were found, out of which 7 met the threshold of a minimum of three documents and five country citations. India had the highest number of publications on this topic, followed by Pakistan, Saudi Arabia, and China. Malaysia and Pakistan exhibited the highest link strength in collaboration. This underscores a global collaborative endeavor involving researchers from several countries.

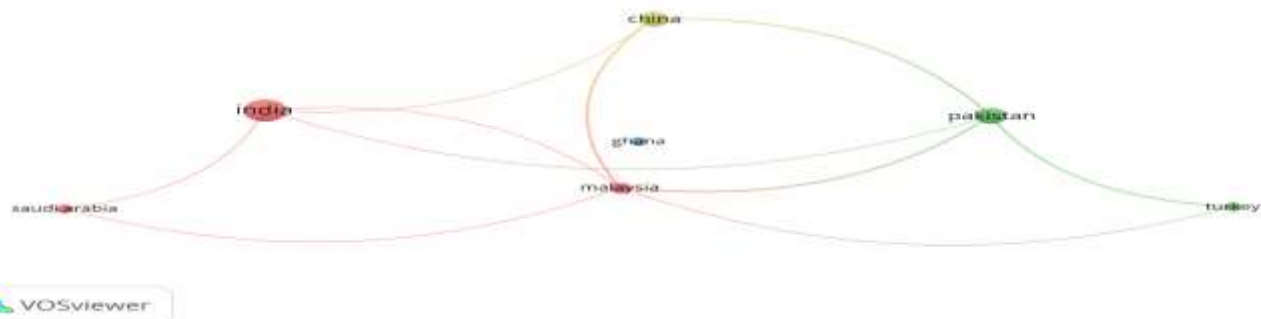


Figure 4. Coauthorship Analysis

### 4.3. Keyword Analysis

The keywords used by the main authors, their co-occurrences, and the most popular keywords in the context of behavioral biases and investment decisions are all covered in this section (see figure 5). With a default minimum criterion of 3, the analysis concentrated on keyword occurrence, considering the small sample database employed in this study. As a result, 216 out of the 12 keywords satisfied the predetermined criterion. Statistical investigations indicate that herding and overconfidence are the two biased investment qualities that have the greatest effects on investment outcomes (Ko and Kim, 2022). Moreover, regression is considered the most common method in such studies.

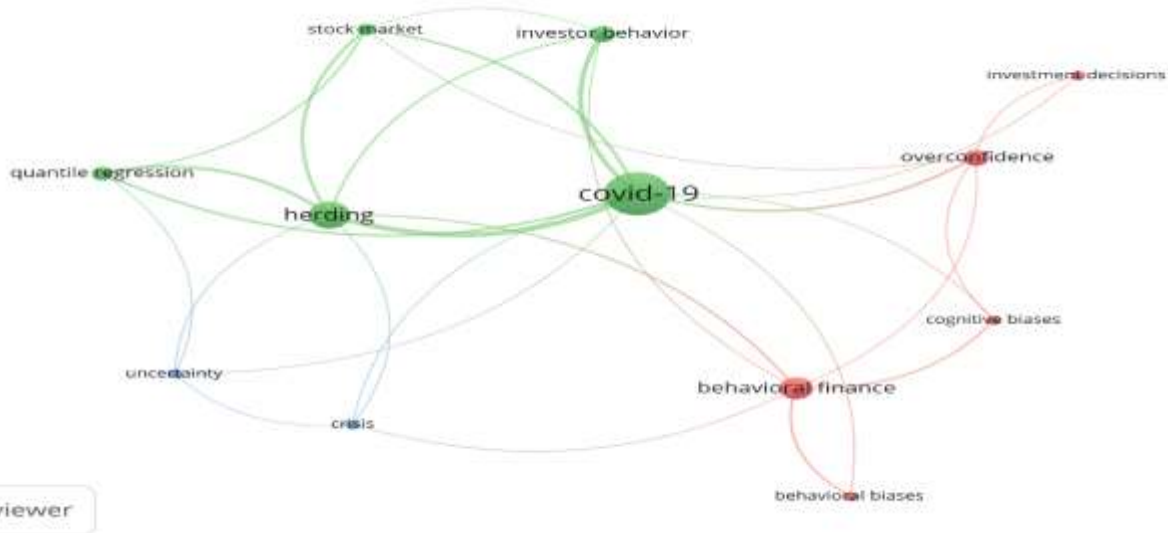


Figure 5. Keyword-based co-occurrence network

### 4.4. Citation

Minimum number of three citations of a document. A total of 51 documents were used, of which 25 were thresholds. The most cited papers are (Dhall & Singh, 2020; Talwar et al., 2021; Parveen et al., 2021c; Shah et al., 2020; Mishra & Mishra, 2021), as shown in Figure 6 (Dhall & Singh, 2020), which shows the highest link.

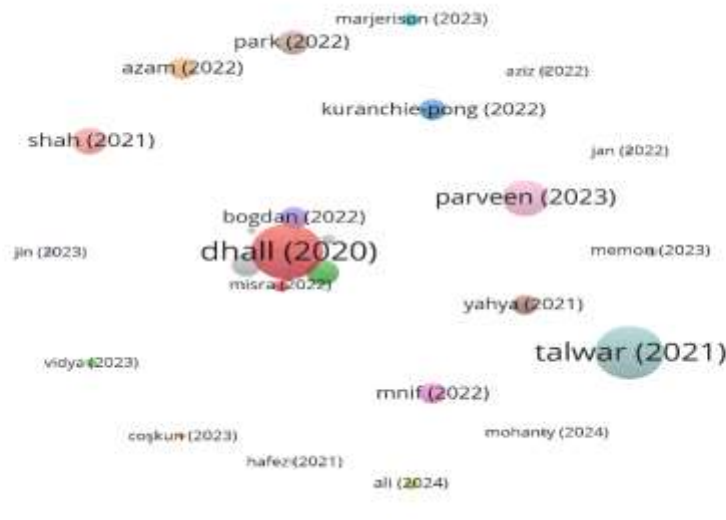


Figure 6. Co-Authorship Analysis of Most Cited Authors

## 5. DISCUSSION

After reviewing the papers, it was discovered that a variety of research methods were employed, with the majority of studies involving theoretical, analytical, and empirical research (Marjerison et al., 2023). Nevertheless, the majority of studies perform quantitative research designs in which the most prominent methods are Regression, Partial Least Squares Structural Equation Modeling (PLS -SEM), and cross-sectional absolute deviation (CSAD). An analysis of the sample database, analytical research indicates that asymmetrical information triggers investor panic, leading to heightened market volatility (Haroon & Rizvi, 2020b).

### 5.1. Year-Wise Distribution Of Dominant Behavioral Biases In Investment Decision-Making

The study identified the most dominant behavioral biases during the phases of COVID-19 in 2020 to 2024, as presented in Figure 7. After deep understanding, it was observed that some behavioral biases were more prominent in particular phases of the pandemic, such as herding biases, which dominated in 2020 in the initial phase of COVID-19. Spread unknown pandemic news and unprecedented information about market-led investors' reaction to rely on crowds rather than performing an individual analysis. Herding biases were most prominent in later phases because asymmetric information was found throughout the pandemic. In the wake of speculative bubbles and the recovery phase of post-pandemic herding, investment decision-making continued to influence. Most studies have observed that overconfidence biases significantly impact investor decision-making. It is evident that overconfident market players underestimate the market and are subsequently overly optimistic about the growth of the economy. Representative, anchoring, availability, disposition effect, loss aversion, and regret aversion are some of the most eminent behavioral biases across all pandemic phases.

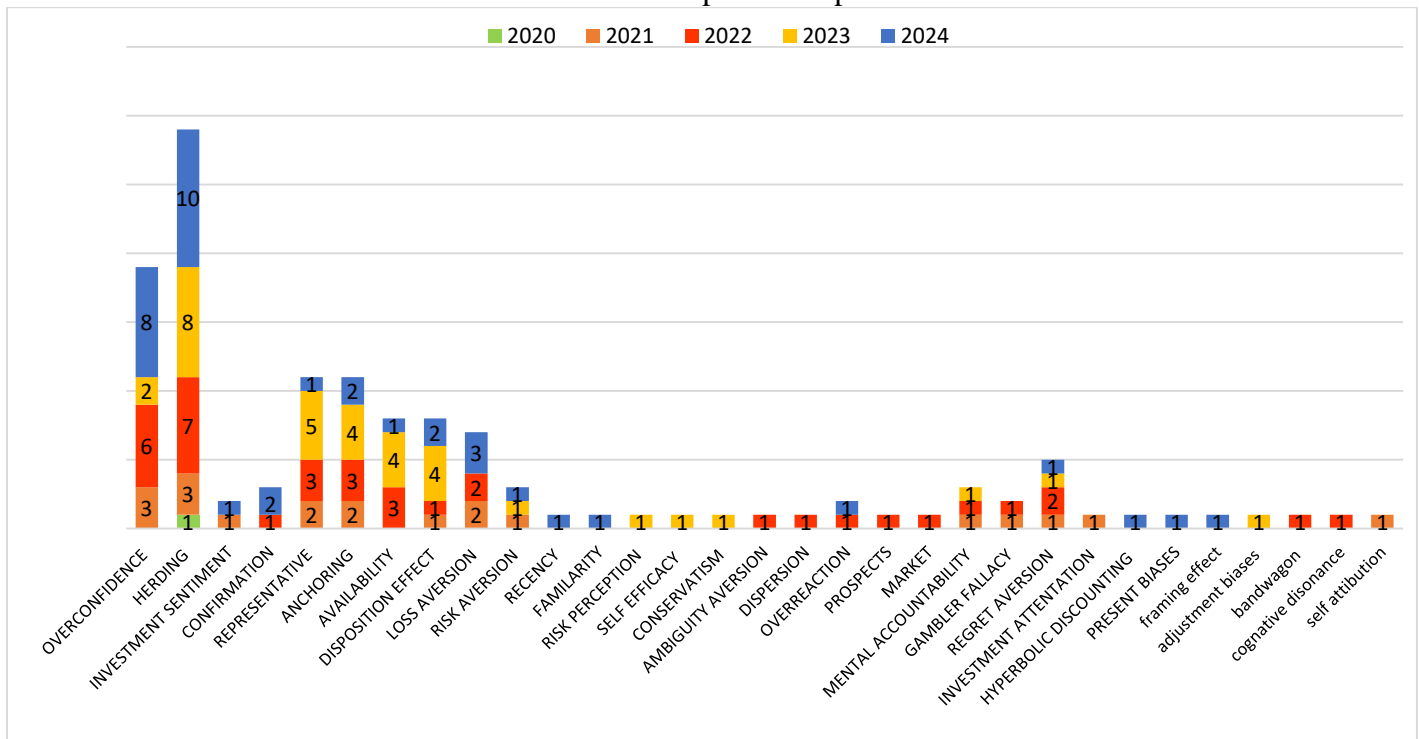


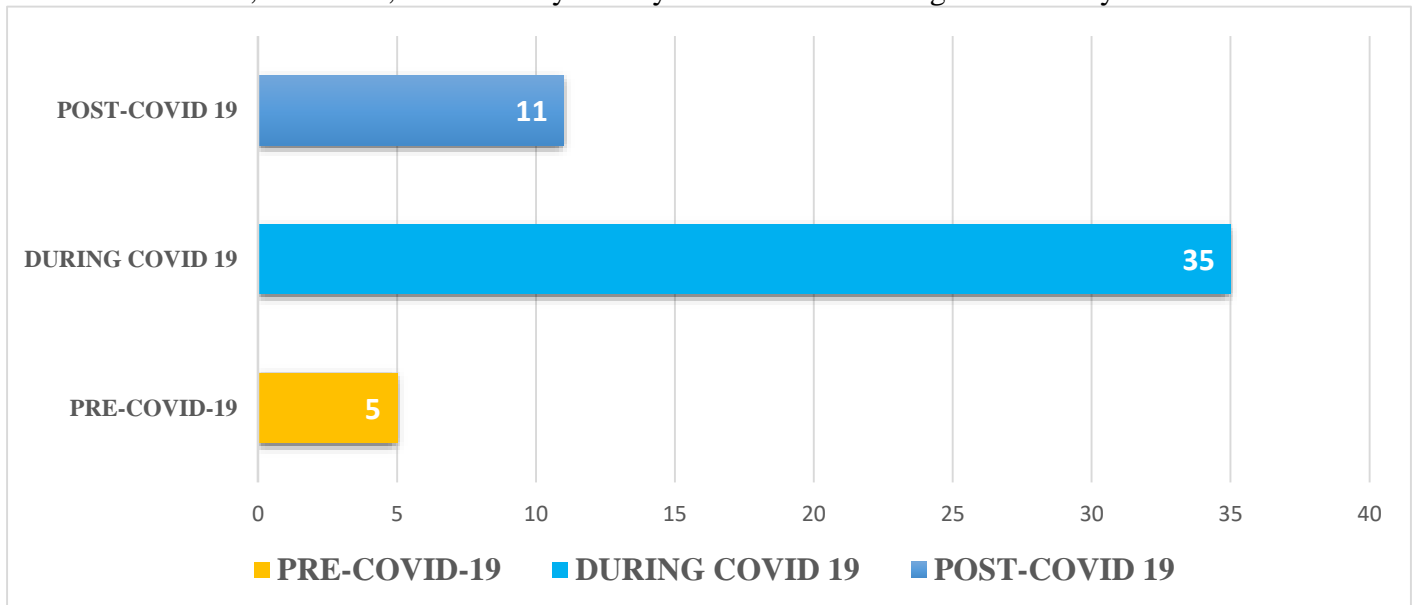
Figure 7. Wise Distribution of the Most Prominent Behavioral Bias over One Year

### 5.2. Behavioral Biases In Investment Decision Making At Three Phases: Pre-, During- And Post- Covid-19

When assessing the bibliometric analyses of various studies, it becomes evident that the majority of studies focus on the impact of behavioral biases on investment decisions during the pandemic, as displayed in Figure 8. There is a disparity in the limited emphasis on the pre- and post-pandemic and decline pandemic periods, with only a

few studies exclusively examining the pre-pandemic phase. These studies primarily aim to identify behavioral biases in investors' decision-making during the pandemic. The focus of post-pandemic studies has centered on understanding changes in investor behavior following the COVID-19 outbreak, with a focus on comprehending stock market anomalies. A significant gap was observed regarding the three phases of COVID-19. For instance, the pre-pandemic literature identified that herding behavior causes panic selling, and scant attention has been paid to how investors' behavior evolved over the recovered market. It provides limited insight into how investors transform from routine decision-making into a crisis-driven phase. Further, it was found that very few papers were published during the post-COVID phase for a deeper understanding of the impact of investor psychology and market dynamics.

Studying the pandemic era is important because it clarifies the ways in which several factors affecting trade volume and stock market prices were impacted prior to, peak, control pandemic phases, and after the pandemic epidemic, as well as how those factors subsequently affected investor choices. Notably, a decrease in the frequency of successful cases had a very favorable effect on stock market decisions made by investors (Machmuddah et al., 2020), which found that short-term occurrences frequently result in negative market reactions. However, over time, the economy usually finds a balance and grows steadily.



**Figure 8.** Distribution of Publication across Different Phases of the COVID-19 Pandemic

## 6. CONCLUSION AND FUTURE RESEARCH DIRECTIONS

Research on behavioral biases has gained immense popularity over the past few decades. Biases are key to explaining investing behavior and financial market abnormalities. This study contributes to the existing literature on behavioral biases by conducting a bibliometric analysis of 44 articles extracted from the SCOPUS database. This bibliometric investigation examined the influence of behavioral biases on the process of making investment decisions before, during, and after the COVID-19 pandemic. The findings demonstrate an increasing interest in comprehending the impact of behavioral biases on investing choices, especially considering the pandemic's extraordinary circumstances. Significantly, the rise in publications from 2020 to 2024 and the varied places of origin of the research- India, Pakistan, and Saudi Arabia—are the most popular, highlighting the global importance of the research area. The analysis also showed the multidisciplinary nature of the research, as evidenced by the wide variety of journals that have published this work. The high citations in journals such as "Millennial Asia", "Psychology and Marketing", and the "Journal of Economic and Administrative Sciences" emphasize the cross-disciplinary impact of the research. An analysis of the chronological distribution of

publications it is evident that the research field witnessed a rapid response in the initial stages of the COVID-19 pandemic, followed by sustained interest and a significant surge from 2022 to 2024. This progression signifies growing research efforts and a deepening understanding of the multifaceted impact of the pandemic on behavioral biases and investment decisions.

The co-author and country co-author analyses revealed collaborative networks, with India leading publications and notable collaborations between countries such as Malaysia, Saudi Arabia, and China. This global collaborative effort among researchers highlights the shared interest and importance of addressing behavioral biases in investment decision-making during the pandemic.

Despite the valuable insights gained from this study, there are avenues for future research to further enhance our understanding of behavioral biases in investment decision-making, especially during global health crises.

## **7. POTENTIAL DIRECTIONS FOR FUTURE RESEARCH INCLUDE**

The study incorporates multiple databases such as Web of Science, Emerald, and Google Scholar to present a more exhaustive perspective on the existing literature. This helps overcome the limitations associated with relying on a single database, such as Scopus, for in-depth Analysis of pre- and Post-Pandemic Periods. Future studies could explicitly concentrate on comprehending behavioral biases in investment decisions made before and during the epidemic, given the vacuum in the literature that has been discovered. A useful insight into how investor behavior changes over time may come from this examination. The long-term effects of global health crises on investor behavior can be obtained by conducting longitudinal research, which can provide a dynamic view of how behavioral biases and investment decisions evolve over time.

The future implications of understanding behavioral biases that influence investment decisions, especially in the context of a global crisis such as COVID-19, are profound for various stakeholders. Investors and financial professionals benefit significantly from the insights derived from this research. The knowledge gained can empower firms to recognize but also navigate biases in decision-making, thereby fostering the development of more informed and resilient investment strategies. Financial institutions and policymakers armed with these findings can strategically design interventions and educational initiatives. These efforts can effectively mitigate the impact of behavioral biases on investors' decisions, enhancing financial literacy and improving decision-making effectiveness. Within the academic community, this study makes a noteworthy contribution by shedding light on research trends, identifying gaps, and presenting opportunities for further research. Future studies can build upon these insights, deepening our collective understanding of the intricate relationship between behavioral biases and investment decisions. In essence, future research in this domain has the potential to act as a guiding force, offering practical solutions and strategies for individuals, institutions, and policymakers to address the evolving landscape of behavioral biases in investment decision-making.

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## **DATA AVAILABILITY STATEMENT**

No new data were generated or analyzed in this study. The bibliometric data were obtained from the Scopus Database.

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## **CONFLICT OF INTEREST**

The authors declare that they have no conflicts of interest.

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