(Derleme)

A COMPREHENSIVE EXAMINATION OF CONSUMER BEHAVIOR AND NATURAL DISASTERS: A BIBLIOMETRIC AND TCCM-BASED REVIEW

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ABSTRACT

This study aims to analyze the body of knowledge focusing on the relationship between consumer behavior and natural disasters from a bibliometric and systematic perspective. The first step of the research analyzed the bibliometric outputs of 161 articles published between 1991 and 2024 on consumer behavior in response to natural disasters. The dataset was retrieved from the Web of Science database in accordance with predefined inclusion and exclusion criteria. During the bibliometric analysis process, co-citation and keyword co-occurrence analyses were conducted using VOSviewer software. In the second stage of the research, 31 empirical studies from the dataset were reviewed using Theory, Context, Characteristics, and Methods to examine the theoretical development of natural disasters and consumer behavior. The Journal of Consumer Research has shaped the publication focus, Icek Ajzen and Roger Clarke are significant authors, and the Theory of Planned Behavior provides a theoretical basis for the area. The TCCM analysis demonstrates the prominence of risk-based theories, a contextual emphasis on floods, earthquakes, and hurricanes, and the dominance of quantitative research approaches. Moreover, research intensity increases immediately after large-scale disasters but declines in post-disaster periods. This pattern indicates that changes in consumption behavior are predominantly examined through event-driven and short-term perspectives.

Keywords: Consumer Behavior, Natural Disaster, Bibliometric Mapping, TCCM, Systematic Review

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TÜKETİCİ DAVRANIŞLARI VE DOĞAL AFETLERİN KAPSAMLI BİR İNCELEMESİ: BİBLİYOMETRİK VE TCCM TEMELLİ BİR İNCELEME

ÖZ

Bu çalışma, tüketici davranışı ile doğal afetler arasındaki ilişkiye odaklanan bilgi birikimini bibliyometrik ve sistematik bir perspektifle analiz etmeyi amaçlamaktadır. Araştırmanın ilk aşamasında, 1991–2024 yılları arasında doğal afet türleri karşısında tüketici davranışlarını inceleyen 161 makalenin bibliyometrik çıktıları değerlendirilmiştir. Veri seti, belirlenen dahil etme ve dışlama kriterleri doğrultusunda Web of Science (WoS) veri tabanından elde edilmiştir. Bibliyometrik analiz sürecinde VOSviewer yazılımı kullanılarak atıf, anahtar kelime ve eş-oluşum analizleri gerçekleştirilmiştir. Araştırmanın ikinci aşamasında ise veri setinde yer alan 31 ampirik çalışma, Teori, Bağlam, Özellikler ve Yöntemler (TCCM) çerçevesi kapsamında incelenmiş ve doğal afetler ile tüketim davranışları arasındaki kuramsal gelişim derinlemesine çözümlenmiştir. Bulgular, yayın odağının Journal of Consumer Research öncülüğünde şekillendiğini, Icek Ajzen ve Roger Clarke'ın en etkili yazarlar arasında yer aldığını ve Planlı Davranış Teorisinin alan için temel bir kuramsal çerçeve sunduğunu ortaya koymaktadır. TCCM analizi ise, risk temelli kuramların da belirginliğini, bağlamsal olarak sel, deprem ve kasırga afetlerine odaklanıldığını ve nicel yaklaşımın baskın olduğunu göstermektedir. Ayrıca araştırma yoğunluğunun büyük ölçekli afetlerin hemen sonrasında arttığı, ancak afet sonrası dönemlerde azaldığı tespit edilmiştir. Bu durum, tüketim kalıplarındaki değişimlerin çoğunlukla olay odaklı ve kısa vadeli yaklaşımlar çerçevesinde ele alındığına dayalı işaret eder nitelikte yorumlanmıştır.

Anahtar Kelimeler: Tüketici Davranışı, Doğal Afet, Bibliyometrik Haritalama, TCCM, Sistematik İnceleme

1. Introduction

"When the earth shakes, so do consumer habits…"

The rapid growth of the population, along with environmental degradation and various other global changes, has made the adverse effects of natural disasters an integral part of daily life. The 2023 Global Disaster Report by the United Nations Office for Disaster Risk Reduction (UNDRR) indicates that disaster-related economic losses have risen by 32% relative to the previous 30 years of data (UNDRR, 2024). In the United States, each of the 27 natural disasters that transpired in 2024 inflicted over one billion dollars in economic damage. However, the consequences of natural disasters are not limited to economic losses; they also bring about significant changes in both individual and collective behavioural patterns.

Pandelica and Pandelica (2011) assert that individuals experience changes in their consumer identities and behaviors during disaster situations. Panic purchasing (Wu et al., 2023), changes in risk-related perceptions (Im, Kim & Choeh, 2021), hoarding tendencies (Zuhairi et al., 2021), increased sustainability consciousness (Setiawan, Sadeli & Mohamad, 2025), and changes in brand trust (Fawaz et al., 2023) illustrate consumer behavior patterns noted in natural disaster situations.

Furthermore, research demonstrates that natural disasters markedly contrast with human-made disasters regarding their origin, perceived control, and psychological effects (Yap, Xu & Tan, 2021), while the correlation between consumer behavior and natural disasters is emerging as a progressively significant area of interest (Alatrista-Salas et al., 2021; Corallo et al., 2024).

The study of consumer behavior has historically concentrated on actions within predictable market conditions; however, there is an increasing acknowledgment of the necessity to investigate behavior in high-risk, uncertain, and emotionally charged contexts (Hsee & Zhang, 2022). Despite the growing demand, the literature on consumer behavior during disasters is notably fragmented, with research scattered across multiple disciplines like marketing, psychology, sociology, environmental sciences, and public health. The fragmented structure limits the development of a comprehensive understanding of the relationship between disasters and consumer behavior, as well as the development of a cohesive research agenda.

This study aims to explain the scientific developments in research concerning the impact of natural disasters on consumer behavior. The first stage of the study consisted of evaluating the fundamental elements shaping the research domain, including journals, authors, and publications, from a bibliometric viewpoint to offer a dynamic view of the relationship between disasters and consumer behavior. After that, the systematic evaluation of empirical studies in the field was carried out using the theories, contexts, characteristics, and methodologies (TCCM) framework, which allows for the proposal of future research directions.

2. Literature Review/ Conceptual Framework

Consumer behavior has traditionally been studied in scenarios where market conditions are predictable; however, extraordinary situations such as natural disasters create "high-risk, uncertain, and emotionally intense" contexts that necessitate a re-examination of established consumption theories (Hsee & Zhang, 2022). This section addresses the conceptual framework that highlights the transformative impact of natural disasters on consumer behavior and the need to systematize the fragmented literature in this field.

Natural disasters are not only physical events that cause economic losses, but also psychological shocks that fundamentally alter individual and collective behavior patterns. The literature shows that the uncertainty created by disasters causes consumers to deviate from rationality in their decision-making mechanisms and engage in more impulsive and protective behaviors (Pandelica & Pandelica, 2011). For example, the "panic buying" behavior observed during disasters is defined as a coping mechanism triggered by perceptions of scarcity and feelings of loss of control (Wu et al., 2023).

During this process, consumers are forced to adapt their existing identities and habits to the new reality brought about by the crisis. Research shows that this adaptation process manifests itself in a wide range of ways, from hoarding tendencies (Zuhairi et al., 2021) to increased sustainability awareness (Setiawan et al., 2025) and the re-evaluation of brand trust (Fawaz et al., 2023). Furthermore, it is noted that natural disasters, unlike man-made disasters, have unique dynamics in terms of perceived control and psychological effects, and that this situation differentiates consumer responses (Yap et al., 2021).

When examining studies at the intersection of natural disasters and consumer behavior, it is evident that the literature is scattered across different disciplines such as marketing, psychology, sociology, and disaster management, and lacks a holistic perspective. While existing studies generally rely on established models such as the Theory of Planned Behavior (Ajzen, 1991), theories such as Risk Perception and Risk Communication are increasingly coming to the fore in explaining the irrational behaviors created by moments of crisis (Rundblad, Knapton & Hunter, 2010; Brown et al., 2023).

An interdisciplinary approach is needed to understand the evolution of consumer behavior within the disaster cycle. However, the fragmented nature of the existing literature limits a comprehensive understanding of this relationship and the establishment of a coherent research agenda.

This study adopts an integrated approach that combines bibliometric analysis with the "Theory, Context, Characteristics, and Methods (TCCM)" framework to systematize the fragmented structure found in the literature (Linnenluecke et al., 2020). Bibliometric analyses reveal the historical accumulation and intellectual structure of a scientific field using quantitative metrics (Ellegaard & Wallin, 2015; Lim & Kumar, 2024); The TCCM framework goes beyond simple citation analysis, enabling in-depth examination of theoretical and practical gaps (Singh & Dhir, 2019; Chen, Mandler & Meyer-Waarden, 2021).

As emphasized by Paul, Khatri, and Kaur (2023), supporting bibliometric studies with a systematic framework is critical for determining the direction of theoretical development. In this context, this study aims to outline the future projections of the field by analyzing the knowledge base in the areas of natural disasters and consumer behavior along the axes of (1) Theories used, (2) Contexts in which research was conducted, (3) Characteristics studied, and (4) Methodologies applied.

3. Methodology

The aim of this research was to combine a bibliometric analysis and a systematic literature review to investigate the impacts of natural disasters on consumer behaviour. According to Linnenluecke et al. (2020), the combination of these methods provides a holistic view of research areas and helps to overcome methodological limitations in order to find research gaps. In this context, while the methodology of the research employs a two-pronged approach (Donthu et al., 2021), the fundamental steps are presented in Figure 1 and explained in the following sections.

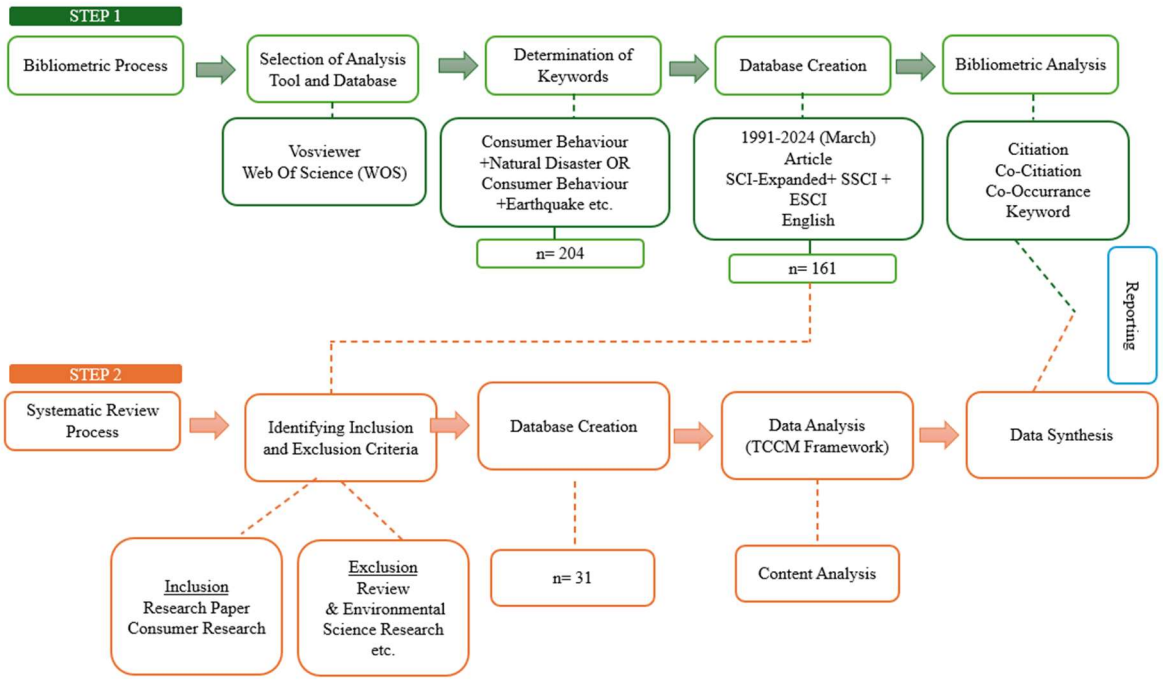

Figure 1. Fundamental Steps of Bibliometric Analysis and Systematic Literature Review

3.1. The Bibliometric Analysis Process

Bibliometric analysis is a quantitative method that employs bibliometric metrics to analyse the historical accumulation of research in scientific databases (Lim & Kumar, 2024). According to Ellegaard and Wallin (2015), the bibliometric approach enables the systematic evaluation of a scientific field, identifying the key actors, institutions, publications, and thematic accumulation

of research areas. Based on the advantages of the bibliometric approach in defining the boundaries and accumulation of a research field, the position of natural disasters in consumer behavior research has been evaluated from a bibliometric perspective.

In conducting the bibliometric analysis, VOSviewer was selected as the primary visualization tool due to its support for overlay visualizations, user-friendly interface, and compatibility across systems through its Java-based framework (Eck & Waltman, 2014). While several software programs, such as CiteSpace, CitNetExplorer, HistCite, and Prism GraphPad, offer bibliometric visualization capabilities, VOSviewer was preferred for its advanced features in mapping scientific networks and highlighting core patterns within the literature.

One of the key considerations in the design of bibliometric research is the selection of the appropriate database from which the data will be extracted. In order to maximise compatibility with the analysis tool used and to avoid any potential issues with missing data, Web of Science (WoS) was selected as the bibliometric database for this study (Archambault et al., 2009). In comparison to other databases, WoS has a larger bibliometric data memory and offers researchers a wider range of opportunities in the data set sharing process (Martín-Martín et al., 2018).

After the database was determined, the keyword inclusion and exclusion process was carried out using a Boolean search strategy applied across the title (TI), abstract (AB), and author keywords (AK) fields within the Web of Science database (Linnenluecke et al., 2020; Donthu et al., 2021). Decisions regarding which keywords should be prioritized were made based on the existing literature. Accordingly, consumer behavior was identified as the primary keyword, while the selection of disaster types to be included in the search set was guided by the disaster classification provided by UNDRR (UNDRR, 2024). Within this framework, the keyword pool for natural disasters was constructed to include earthquakes, floods, droughts, hurricanes, tsunamis, and volcanic eruptions. In the WoS-based search process, the consumer behavior keyword was combined with the identified disaster types and subjected to the defined search strategy (Paul et al., 2023).

In the literature review covering the period from 1991 to March 2024, the initial dataset size was determined as 204 scientific outputs following the identification and input of the relevant keywords into the system. Subsequently, inclusion and exclusion criteria were applied to construct the main dataset. Within this scope, only academic journal articles that had completed the publication process were included in the study. Accordingly, outputs such as conference abstracts, book chapters, and editorial notes were excluded, and the dataset was reduced to 172 research articles.

In order to examine the knowledge base of the field through sources shaping the intellectual structure of the literature, index-based criteria were then applied. Within this framework, only publications indexed in SCI-EXPANDED, SSCI, and ESCI were included in the research dataset, resulting in a total of 169 articles.

In the final stage of the inclusion–exclusion process, language criteria were taken into consideration. Accordingly, the research dataset was restricted to studies published in English, and the final bibliometric dataset size was determined as 161 scientific articles.

After the main dataset was established, data cleaning procedures were applied to eliminate duplication issues in the bibliometric outputs, and erroneous or repeated entries were corrected and merged within the dataset. In selecting the analytical techniques, a journal-level co-citation analysis was employed to identify the core publication outlets shaping the research field. Within this framework, a minimum citation threshold of 20 citations per source was applied in order to allow journals with marginal yet meaningful contributions to emerge within the analytical structure (Lim & Kumar, 2024). As a result of this threshold, 47 journals out of a total of 4,350 were included in the final bibliometric network.

Another analytical parameter applied in the bibliometric analysis process was based on co-citation analysis in order to reveal the theoretical foundations and intellectual reference points of the field (van Eck & Waltman, 2014). Within the scope of this analysis, a minimum threshold of three citations was applied to prevent the exclusion of theoretically niche studies and to ensure a balanced representation of the literature. Accordingly, 45 out of 8,200 sources met the analysis criteria, and the analysis was restricted to the largest connected component (van Eck & Waltman, 2014).

In the keyword co-occurrence analysis conducted to examine the dominant research areas, a total of 1,347 unique keywords were identified in the main dataset. In constructing the network structure, a minimum occurrence threshold of five was applied in order to eliminate keywords that did not contribute to contextual coherence and to highlight the core thematic structures of the field (Donthu et al., 2021). Accordingly, the main network was analyzed based on 42 keywords.

In the final stage of the bibliometric analysis process, an author co-citation analysis was conducted to identify influential scholars within the field. Subsequently, a minimum threshold of at least one publication and zero citations per author was applied in order to ensure that only authors actively contributing to the field were represented in the network. Ultimately, the resulting network analysis depicted the interactions among 59 authors.

3.2. The Systematic Review Process

Bibliometric studies predominantly evaluate research through citation-based indicators, which may limit the identification of theoretical and practical gaps within the literature (Paul et al., 2023). In this context, the TCCM framework was adopted in the present study to address the limitations of bibliometric techniques and to enable a more comprehensive examination of existing research (Singh & Dhir, 2019; Chen et al., 2021). Specifically, the TCCM approach examines the body of scientific knowledge by focusing on theoretical perspectives in the field (Theory – T), the context-dependent evolution of the literature (Context – C), the core variables emphasized by researchers (Characteristics – C), and the methodological approaches that shape

research processes (Methods – M). Accordingly, the TCCM framework was employed as the basis for the second stage of the analysis to reveal the theoretical structures and orientations underlying the relationships among authors, journals, and publication indices identified during the bibliometric analysis process (Linnenluecke et al., 2020).

In the following analytical process, the primary dataset consisting of 161 research articles was first subjected to predefined inclusion and exclusion criteria. In determining these criteria, the underlying assumptions of the TCCM framework were taken as the basis, and only research articles containing explicit methodological applications were included in the dataset. All authors were involved in the identification of empirical studies, and the final dataset was determined to consist of 31 empirical research articles.

To conduct the coding process, the researchers developed a coding matrix aligned with the TCCM framework (Dodd, Graves, & Hentzen, 2022), as presented in Table 1. The coding matrix comprised ten coding categories: publication identity, research objectives, theoretical and conceptual frameworks employed, disaster type examined, contextual characteristics, methodological orientation, variables, sample size, key findings, and practical implications.

Table 1. Mapping of Coding Categories to the TCCM Framework

Coding Category	TCCM Dimension
Publication Identity (Author, Year, Title, Location)	Context (C)
Research Objectives	Characteristics (C), Theory (T)
Theoretical and Conceptual Frameworks	Theory (T)
Disaster Type Examined	Context (C)
Contextual Characteristics (Geographical / Social Context)	Context (C)
Methodological Orientation (Qualitative / Quantitative / Mixed)	Methods (M)
Variables / Constructs Examined	Characteristics (C), Methods (M)
Sample & Sample Size	Methods (M)
Key Findings	Characteristics (C), Theory (T)
Practical Implications and Suggestions	Characteristics (C), Theory (T)

Note. *Developed by the authors based on prior TCCM-based systematic review studies (Singh & Dhir, 2019; Linnenluecke et al., 2020; Chen et al., 2021).*

During the coding phase, two researchers were actively involved, and following the independent coding process, disagreements related to code–theme relationships were resolved through discussion and consensus. The finalized coding table was subsequently reviewed by a third researcher in order to enhance methodological rigor.

4. Findings

4.1. Bibliometric Findings

Co-citation analysis indicates the potential of significant publication trends within a scientific discipline to impact the field and provide a basis for future research (Van Eck & Waltman, 2014). A co-citation analysis was performed to identify journals that prominently publish research on consumer behavior concerning natural disasters. To ensure the inclusion of journals with both substantive influence and meaningful network connectivity, a minimum citation threshold of 20 citations per source was applied. This threshold was selected to balance analytical parsimony with adequate representation of the field's intellectual structure. As a result, 47 journals were retained for analysis and organized into four distinct clusters (Figure 2), highlighting the multidisciplinary composition of the literature spanning marketing, psychology, environmental sciences, and public policy.

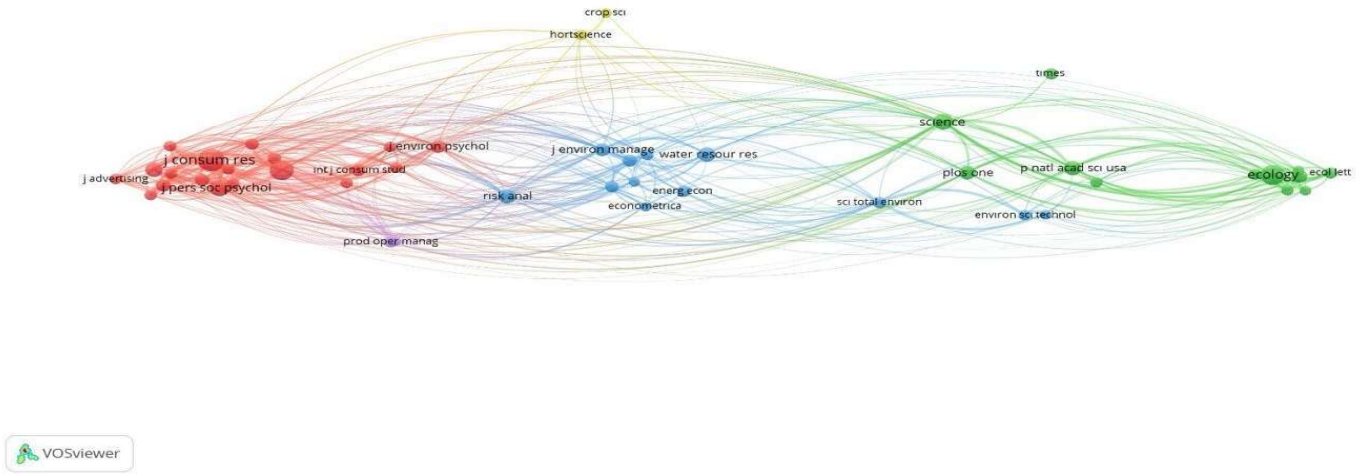

Figure 2. Co-Citation Analysis Map of Journals

When Figure 2 is examined, it is observed that journals exhibiting strong publication and citation dynamics are predominantly concentrated within the red cluster. An analysis of the units constituting this cluster indicates that journals grounded in the social sciences—particularly marketing, business, and psychology—are especially prominent. In this respect, the red cluster represents a research orientation in which studies on consumer behavior in the context of natural disasters primarily emphasize decision-making processes, risk perceptions, and psychological responses to crisis situations.

In support of the red journal cluster, an examination of the blue cluster reveals a concentration of journals focusing on risk analysis, environmental management, and resource economics. The

interaction between the red and blue networks can therefore be interpreted as reflecting a methodological and analytical bridge between consumer behavior research and disaster risk assessment. Moreover, an analysis of the journal network within the yellow cluster highlights outlets related to agriculture and horticulture, whereas the green cluster predominantly consists of high–impact factor, multidisciplinary journals with a strong focus on environmental sciences, such as Science and Ecology. Taken together, the journal-based networks reflecting the intellectual contributions of different disciplines indicate that the relationship between disasters and consumer behavior constitutes a distinctly multidisciplinary publication domain. Based on this observation, Table 2 presents the five most influential journals in the field according to citation frequency and total link strength.

Table 2. Most Influential Journals

Journals	Citations	Total Link Strength
Journal of Consumer Research	103	73.93
Journal of Business Research	85	63.91
Ecology	83	56.21
Journal of Personality and Social Psychology	61	50.28
Science	59	48.37
Journal of Marketing Research	45	39.91

The citation metrics (Table 2) indicate that the *Journal of Consumer Research* (Citations: 103, Total Link Strength: 73.93) is the top journal regarding citation and network strength. *The Journal of Business Research* follows with 85 citations and a total link strength of 63.91, while *Ecology* has 83 citations and a total link strength of 56.21.

The prominence of journals such as the Journal of Consumer Research and the Journal of Business Research indicates that consumer research and applied management approaches represent the dominant research perspectives in the field, while the strong positioning of environment-focused journals suggests that they provide a valuable roadmap for the accumulation of knowledge in the context of natural disasters. More specifically, when the clusters are evaluated collectively, it becomes evident that the field is structured around a behavioral core, supported by knowledge flows grounded in risk, environmental, and sustainability-oriented perspectives.

In order to identify the researchers contributing to the scientific production dynamics, an author-based co-citation analysis was conducted, resulting in the identification of 59 authors with at least 5 citations. The bibliometric co-citation network formed by these authors (Figure 3) and the metrics of the top 5 most active authors in the field are presented below (Table 3).

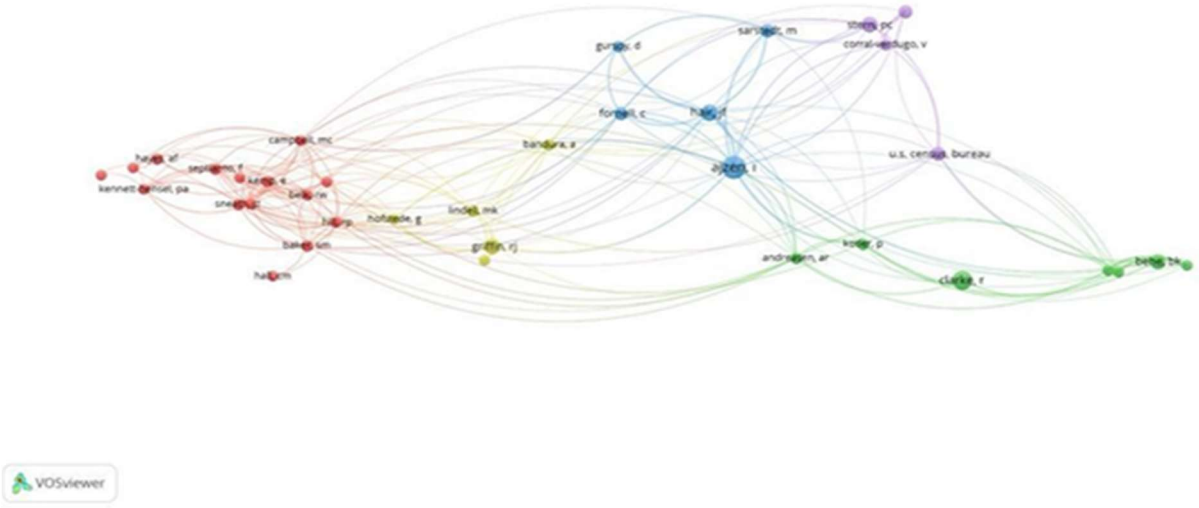

Figure 3. Authors Co-Citation Map

As a result of the co-citation analysis, 5 distinct author clusters and 187 links were identified. Within these co-citation networks, Icek Ajzen, the pioneer of the Theory of Planned Behavior, emerged as the most prominent author in the field, with 21 citations and a total link strength of 68 (Table 3).

Table 3. Most Influential Authors

Author	Citations	Total Link Strength
Icek Ajzen	21	68
Roger Clarke	15	7
Joseph F. Hair	11	60
Paul C. Stern	10	54
Robert J. Griffin	10	33

A total of 8,200 citations were identified within the scope of the co-citation analysis conducted on references highlighting the relationship between natural disasters and consumer behavior. 45 studies that received at least three citations were identified during the analysis procedure (Figure 4).

"The Theory of Planned Behavior," published by Ajzen in 1991, is the most influential study that guides research in the field when Table 4 is analyzed. This discovery suggests that the Theory of Planned Behavior's assumptions are one of the most prominent approaches to comprehending the correlation between consumption and natural disasters. Similarly, a detailed examination of the studies presented in the table indicates that the research led by Fornell, which ranks second, can be regarded as an indicator of the dominance of quantitative approaches in the field (Fornell & Larcker, 1981). In contrast, the studies highlighted by Baker (2009) andDelorme, Zinkhan & Hagen (2004) suggest that during disaster processes, consumers'

socio-economic, psychological, and structural vulnerabilities are manifested through differentiated consumption behaviors, reflecting an outward expression of these vulnerabilities.

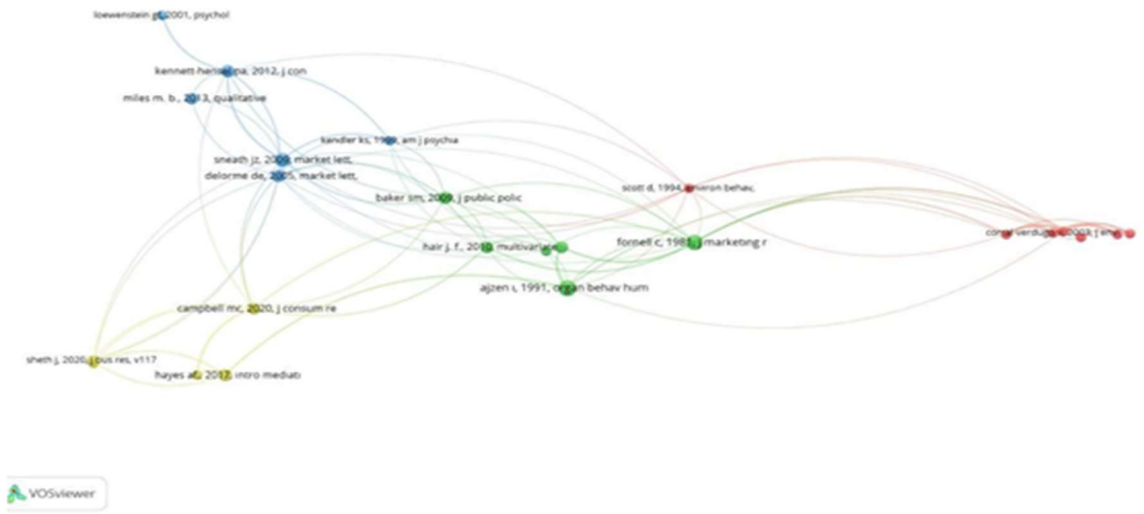

Figure 4. Co-Citation Analysis Map of Cited References

Table 4. Most Influential Articles

Author	Year	Journal	Citations	Total Link Strength
Ajzen, I.	1991	Organizational Behavior and Human Decision Processes	8	12
Fornell, C.	1981	Journal of Marketing Research	7	21
Sneath, J.Z.	2009	Marketing Letters	6	24
Baker, S.M.	2009	Journal of Public Policy & Marketing	5	20
Delorme, D.E.	2004	Marketing Letters	5	22

The co-occurrence method was employed to analyze keywords, with a threshold frequency of 5. 42 keywords that met the threshold frequency were identified in the dataset. The keywords were categorized into six categories (Figure 5).

The top three most prominent keywords in each cluster are presented in Table 5. The dominant theme in the primary research stream is drought (Co-occurrences: 12, Total Link Strength: 18), as discovered through the examination of the network relationships within the first cluster. Consumption and the Theory of Planned Behavior are also identified as significant themes that contribute to and enrich the field.

In the second research cluster, behavior-based keywords stand out, with demand (Co-occurrences: 7, Total Link Strength: 11) identified as the theme with the strongest network of relationships among the relevant keywords.

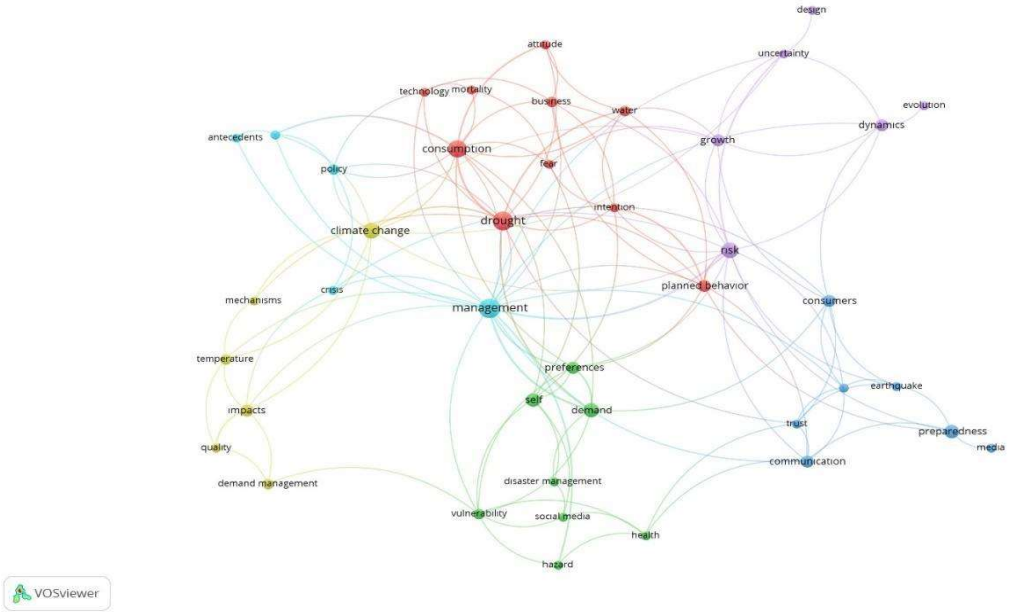

Figure 5. Co-Occurrence Analysis Map of Keywords

The third cluster highlighted communication and consumers as topics that equally impact the field (Co-occurrences: 5, Total link strength: 7), but readiness appeared as the most interactive theme (Co-occurrences: 6, Total link strength: 5).

In the fourth cluster, climate change (Co-occurrences: 8, Total link strength: 10) emerges as the most prominently highlighted subject. In the fifth cluster, risk (Co-occurrences: 8, Total link strength: 18) is recognized as the predominant theme emphasized in the research.

Finally, in the sixth cluster, the topic of governance (Co-occurrences: 13, Total link strength: 25) was identified as the predominant theme and emerged as the most impactful among all the terms.

When you look at all of the results together, it's clear that most of the studies that have been done on the link between natural disasters and consumer behavior have focused on management, drought, and risk.

Table 5. Keywords Co-Occurrences in Respective Clusters

Cluster	Keywords	Co-occurrences	Total Link Strength
1	Drought	12	18
	Consumption	10	17
	Planned Behavior	5	11
2	Demand	7	11
	Self	6	7

	Preferences	5	9
3	Preparedness	6	5
	Communication	5	7
	Consumers	5	7
4	Climate change	8	11
	Impacts	5	7
	Demand management	4	3
5	Risk	8	18
	Growth	5	7
	Uncertainty	3	7
6	Management	13	25
	Policy	4	6
	Gender	3	6

4.2. Systematic Review Findings

The review of the 161 studies in the bibliometric analysis determined that 31 of them included an empirical structure. The TCCM framework was employed to review the findings of these 31 investigations, and the outcome's fundamental structure is explained below under identified headings.

4.2.1. Theory (T)

The examined research utilized several theoretical frameworks to analyze consumer behavior during natural disasters. Figure 6 shows that *"Risk Communication Theory"* is the most frequently used theoretical framework.

A common focus of this research is that, during times of crisis, individuals' decisions are primarily driven by perceptions rather than rationality (Rundblad et al., 2010; Rundblad, Knapton & Hunter, 2014; Brown et al., 2023; Garcia-Collart, 2024).

Variables such as risk perception, the timing and content of communication, and audience-specific customization are highlighted as essential components in effective crisis management and public communication strategies. Recent research indicates that risk-based communication strategies influence consumer trust (Garcia-Collart, 2024) and direct purchasing behavior in disaster contexts (Brown et al., 2023).

The second significant theoretical trend that has emerged in research that focuses on consumer behavior during disasters is the *"Risk Perception Theory."* A substantial amount of the literature that was examined consists of studies that examine risk perception in relation to "Risk

Communication Theory" (Rundblad et al., 2010; Damon et al., 2013; Brown et al., 2023; Geaves et al., 2024).

The prevalence of alternative theories employed in empirical research demonstrates that Prosocial Marketing Theory (Lowe et al., 2014; Sony & Ferguson, 2017; Li & Atkinson, 2020) and Social Identity Theory (Menozzi & Finardi, 2019; Garcia-Collart, 2024) are predominant. A growing body of research examines the influence of social connection and altruistic behavior on disaster processes. The Theory of Planned Behavior (Valencia & Crouch, 2008; Sony & Ferguson, 2017) and Expectancy Theory (Septianto et al., 2022; Geaves et al., 2024) are recognized as significant theoretical frameworks in the field, which is consistent with bibliometric data findings. Considering all these theories together, it is clear that the research landscape has a significant bias towards behavior- and psychology-centered approaches.

Figure 6. Prominent Theories

In addition to the theoretical frameworks, the systematic review also identified the most frequently investigated variables within disaster-related consumer research. As presented in Figure 7, "Consumer Behavior" was the most commonly examined variable, featuring in 9 of the reviewed studies. This indicates a strong research emphasis on understanding how individuals behave and make decisions in the face of natural disasters (Rundblad et al., 2014; Chandrasekar & Rehman, 2024). *"Risk Perception"* closely follows with 8 studies, highlighting its critical role in shaping behavioral and emotional responses during crises (Menozzi & Finardi, 2019; Geaves et al., 2024).

Emotional distress is another prominent focus in the literature, emphasizing the impact of post-disaster emotional states (such as stress, grief, etc.) on consumers' perceptions and purchasing behavior (Veer et al., 2016; Li & Atkinson, 2020; Chandrasekar & Rehman, 2024). Supporting this finding, the most frequently highlighted independent variables in the literature have been identified as purchasing behavior and awareness. Furthermore, other variables explored in the literature include public policy (Curiel et al., 2019), prosocial behavior (Okazaki et al., 2015), and climate awareness (Moon et al., 2018).

These findings suggest that while traditional variables like consumer behavior and risk perception dominate the literature, there is a meaningful diversification toward psychological, social, and environmental factors reflecting a more holistic approach to consumer research in natural disasters contexts.

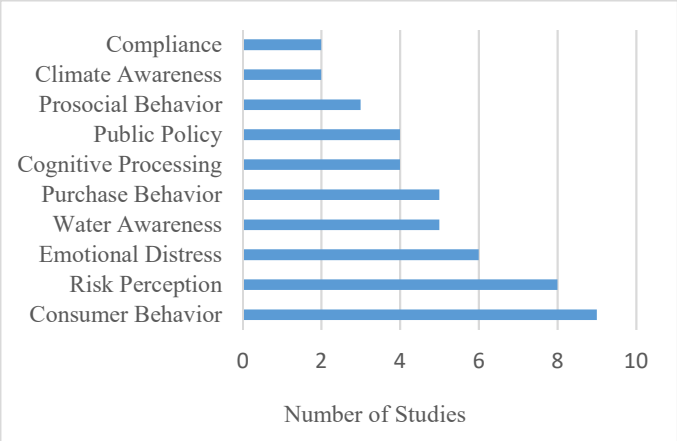

Figure 7. Prominent Research Variables

Moreover, while psychology- based theories dominate the existing literature, disciplines such as marketing, economics, and sociology remain comparatively underrepresented, highlighting an imbalance that both reflects the field's behavioral focus and underscores its interdisciplinary potential.

4.2.2. Context (C)

The reviewed literature reflects a diverse range of disaster types investigated within the context of consumer behavior. Floods emerged as the most frequently studied disaster, appearing in 11 of the 31 reviewed articles (Figure 8). This may be attributed to their increasing frequency and direct impact on daily life across various geographic regions. Earthquakes (n=8) and hurricanes (n=6) also featured prominently, aligning with their high visibility and destructive consequences.

Other disaster types, such as droughts (n=5) and tsunamis (n=4), were moderately represented, while economic crises (n=3), political crises, terrorism, wildfires, and food contamination (each n=2) received relatively limited attention. Rarely explored contexts included nuclear disasters, mudslides, and volcanic eruptions, each addressed by only one study.

These findings indicate that while certain high-impact and high-frequency natural disasters dominate the literature, there remains considerable scope for expanding research into less-explored yet socially and psychologically disruptive contexts. Addressing this gap may contribute to a more comprehensive understanding of consumer behavior under diverse crisis conditions.

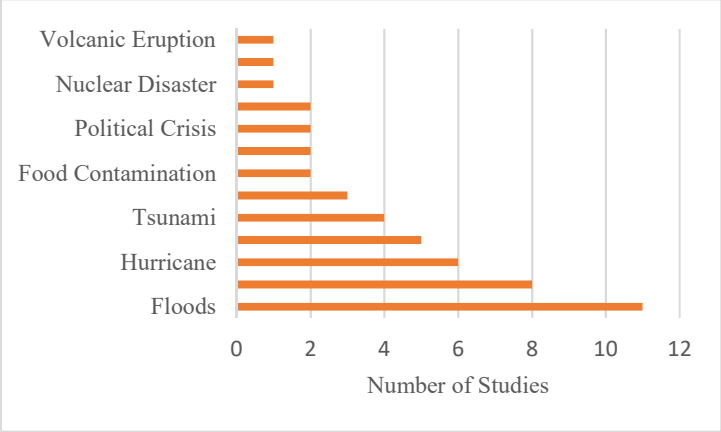

Figure 8. Disaster Types

The distribution of empirical studies by country reveals significant geographical disparities in the investigation of consumer behaviour in the context of natural disasters. As illustrated in Figure 9, the United States dominates the literature, serving as the primary data source in 14 of the reviewed studies (Lee, 2010; Damon et al., 2013; Knuth et al., 2018).

This suggests a strong research focus on U.S.-based consumer responses, possibly due to both the frequency of natural disasters in the region and the availability of academic infrastructure and funding. Following the U.S., countries such as the United Kingdom (Rundblad et al., 2014; Geaves et al., 2024).

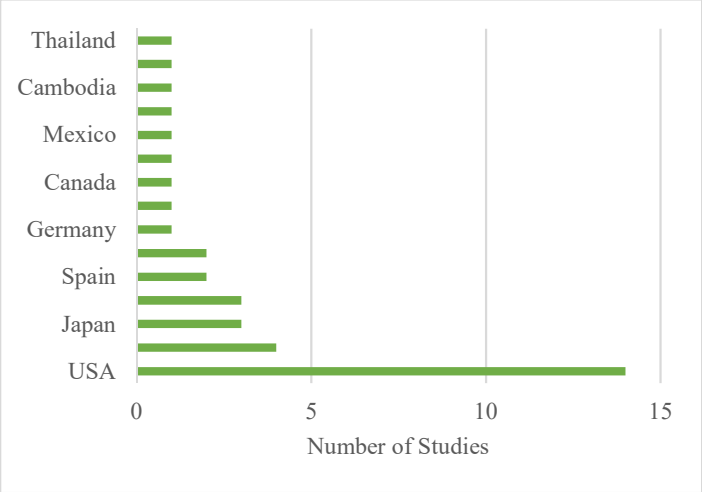

Figure 9. Prominent Research Contexts

Japan (Kudo & Nagaya, 2017) and Australia (Brown et al., 2023) appear more moderately represented, each contributing to multiple empirical datasets. In contrast, several countries, including Germany, China, and Thailand, appear only once in the data collection records, indicating a relative underrepresentation (Fawaz et al., 2023; Lu et al., 2023). The limited inclusion of Global South regions—despite their high vulnerability to natural disasters—highlights a critical research gap and suggests the need for more inclusive, cross-cultural

investigations that capture a broader spectrum of consumer experiences and adaptive behaviours across diverse socio-economic and geographic contexts.

4.2.3. Characteristics (C)

Figure 10 illustrates the temporal distribution of 31 publications within the domain. Peaks are observed in 2014 and 2023, indicating heightened scholarly interest during those years. A consistent increase is noticeable in the recent period, reflecting growing academic engagement with the topic.

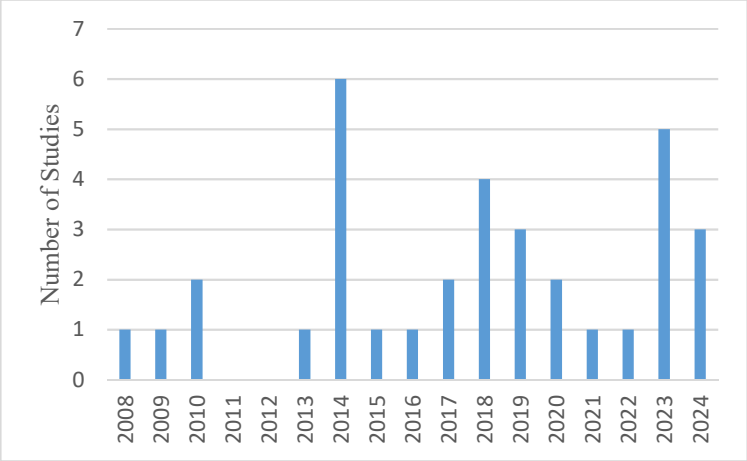

Figure 10. Temporal Distribution of the Publications

The temporal distribution of studies focusing on natural disasters reveals a gradual but meaningful increase in scholarly interest over time. While the early 2000s witnessed only a limited number of publications on the intersection of natural disasters and consumer behaviour, a noticeable rise became apparent after 2010. This upward trend appears to correspond with the increasing frequency and severity of natural disasters such as earthquakes, floods, and droughts, which have not only caused humanitarian crises but also disrupted markets and consumer routines. Particularly in the post-2015 period, the growing global emphasis on sustainability, climate resilience, and environmental risk awareness may have catalyzed more academic inquiry into how consumers respond to nature-induced threats. The peak observed in the most recent years reflects a heightened recognition of the socio-economic implications of natural disasters. This pattern suggests an emerging academic consensus on the need to better understand and anticipate consumer responses to ecological disruptions in order to enhance both market preparedness and policy design.

In addition, recent large-scale climate- related events and disasters appear to have influenced the thematic and temporal evolution of the literature. The observed increase in publication intensity following major disasters suggests that research activity is often event-driven, with heightened scholarly attention emerging in the immediate aftermath of large-scale crises. This pattern reflects the reactive nature of the field, where empirical inquiry tends to intensify in

response to salient real-world disruptions rather than through sustained, long-term research agendas.

4.2.4. Methods (M)

The reviewed studies employed a variety of methodological approaches to explore consumer behavior in the context of disasters (Figure 11). Although the total number of studies was 31, the cumulative frequency of methods exceeded this figure, as several studies applied more than one research method.

Quantitative methods were dominant, with techniques such as surveys, structural equation modeling (SEM), experimental designs, and various statistical modeling approaches being widely used (Valencia & Crouch, 2008; Rundblad et al., 2014; Septianto et al., 2022). A total of 30 instances of quantitative methods were identified across the studies. In contrast, qualitative methods appeared in 18 instances, most commonly in the form of case studies (Fawaz et al., 2023), focus groups (Damon et al., 2013), and text-based techniques such as repertory grid or visual elicitation (Curiel et al., 2019). Only one study explicitly employed a mixed-methods approach that integrated both qualitative and quantitative techniques.

This distribution indicates a strong methodological preference for quantitative approaches in the field, possibly driven by the desire for generalizable and statistically robust results. However, the relatively limited use of qualitative and mixed methods suggests an opportunity for future research to adopt more interpretive or exploratory designs, which may provide richer insights into individual and contextual factors shaping consumer behavior during crises.

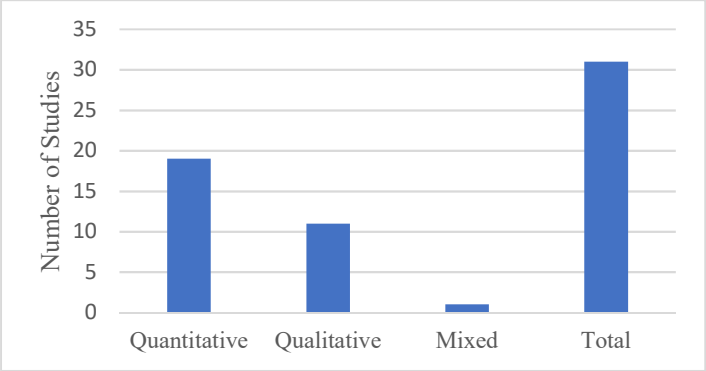

Figure 11. Distribution of Methodological Approaches

5. Conclusion

This systematic review presents a comprehensive synthesis of consumer behavior research in the context of natural disasters. The findings reveal that consumers do not merely react to crises with rational cost-benefit assessments; rather, their behavior is shaped by a complex interplay of risk perception, emotions, communication cues, and contextual influences. Across 31 studies, distinct thematic clusters emerged, offering nuanced insights into the multifaceted nature of natural disaster-induced consumer responses.

First, risk perception was found to be a pivotal factor influencing decision-making processes, from stockpiling essentials to brand switching during crises. While traditional rational models fall short in explaining these behaviors, behavioral theories such as Prospect Theory provided stronger explanatory power (Pan et al., 2020; Chandrasekar & Rehman, 2024).

Second, the role of communication strategies proved critical. Cognitive messaging often outperformed emotional appeals in reducing avoidance behaviors, though mismatched messages occasionally demonstrated counterintuitive effectiveness. In parallel, online storytelling emerged as a tool for emotional resilience and community bonding (Okazaki et al., 2015; Veer et al., 2016).

Third, studies on resource consumption, particularly water and energy, showed that post-disaster behavioral shifts may persist over time. Interestingly, regulatory mechanisms and education appeared more effective than financial incentives in promoting sustainable behavior (Dascher et al., 2014; Rundblad et al., 2014).

In terms of purchase behavior, disaster contexts often catalyze a shift toward essential needs, followed by preferences for safety and reliability. Notably, frugal consumption and changing brand loyalties were pronounced during health-related crises (Chandrasekar & Rehman, 2024; Pan et al., 2020). The delicate balance between reasonable preparedness and panic-induced hoarding also drew attention to market dynamics.

Social marketing campaigns were effective in raising awareness and shaping protective behaviors, especially when both structural and voluntary elements were combined. Moreover, emotional triggers, such as visually evocative campaigns, enhanced consumer engagement—although the potential for emotional oversaturation was noted (Lowe et al., 2014; Kudo & Nagaya, 2017).

Another key theme was the limited translation of environmental concern into green behavior, despite high levels of ecological awareness. Here, perceived consumer effectiveness, social norms, and national identity played significant roles in shaping sustainable choices (Nishio et al., 2014; Jiménez-Barreto et al., 2023).

The findings also suggest that crisis typology matters: human-made disasters typically evoke fear, while natural disasters elicit anxiety—both leading to different coping and consumption strategies, such as escapist, materialist, or experiential tendencies (Nishio et al., 2014; Chandrasekar & Rehman, 2024).

Finally, this review underscores the heterogeneity of consumer responses. Psychological traits (e.g., self-confidence), environmental sensitivity, and sociocultural identity contributed to differentiated reactions, highlighting the need for segmented communication strategies tailored to specific consumer profiles (Moon et al., 2018; Lu et al., 2023).

From a managerial perspective, the findings offer several actionable implications for marketing practice in disaster contexts. First, marketers should prioritize transparent, timely, and risk-sensitive communication strategies, as consumers' trust and purchase decisions are strongly

shaped by perceived credibility during crises. Second, segmentation based on risk perception and emotional response becomes critical, as consumer reactions range from precautionary stockpiling to heightened brand switching. Third, marketing strategies that emphasize reliability, availability, and social responsibility (rather than promotional intensity) appear more effective in sustaining brand trust in post-disaster periods. Finally, integrating social marketing principles into commercial communication strategies may help firms align short-term market responses with long-term societal resilience.

In conclusion, this study not only maps the evolving theoretical and methodological terrain of disaster-related consumer research but also reveals significant practical implications for policymakers, marketers, and sustainability advocates. Future research should further explore under-investigated disaster types, integrate mixed-method designs, and consider long-term behavioral shifts to develop more resilient consumer behavior models in an era of increasing global uncertainty.

6. Limitations and Future Research Directions

While this study provides a comprehensive bibliometric and TCCM-based overview of consumer behavior research in the context of natural disasters, several limitations should be noted. First, the analysis relies solely on English-language articles indexed in the Web of Science database, which may have led to the exclusion of relevant studies published in other outlets or languages. Second, the empirical studies reviewed within the TCCM framework are largely quantitative in nature, reflecting a methodological tendency in the field and potentially limiting deeper qualitative insights. Finally, the reviewed literature tends to focus on a limited set of disaster types (most notably floods, earthquakes, and hurricanes) and is geographically concentrated in developed countries, which may restrict the broader applicability of the findings. Future research could benefit from expanding data sources, employing more diverse methodological approaches, and examining underexplored disaster contexts and regions.

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