Exploring Research Dynamics in Aggression and Violence

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Abstract

Background: From 1994 to 2023, the research landscape on the subjects of aggression and violence has grown considerably, influenced by a growth in concerns around mental health, the prevention of violence, and cross-disciplinary approaches in the study of human behavior. The rising complexity of such fields requires a bibliometric analysis for an understanding of the thematic trends, key research areas, and scholarly collaborations that have shaped this body of knowledge. **Objective:** This study attempts to conduct an inclusive bibliometric analysis representing important themes, research trends, and interdisciplinary relationships of scholarship on psychology, aggression, violence prevention, and other public health-related topics in the past three decades. This paper aims at identifying influential topics, authors, and emerging areas of interest as well as shedding light on potential gaps in this research area. **Methods:** A bibliometric approach has been applied using VOSviewer for network visualization and mapping. The dataset includes scholarly publications in the period between 1994 and 2023; co-authorship, citation analysis, and keyword co-occurrence are included. Major research clusters, prominent authors, and thematic trends identified in this paper represent the main findings in a visual manner. An overview of key topics and their

interrelations is shown visually in word clouds and network visualizations. Findings: Results show that psychology is the most dominant discipline in the discourse of aggression, violence, and public health. Dominant topics include mental health, suicide prevention, poison control, and occupational safety. Other fast-growing topics deal with cyber-aggression and mediafueled violence, reflecting technological changes impinging on behavioral studies. There is considerable interdisciplinary interaction, especially between psychology and medicine and/or public health. These three issues do not cover the broadness of research; other areas, such as environmental health and substance abuse, are underrepresented in the scholarship. **Conclusion:** This bibliometric analysis underlines the role of psychology and public health as significant in addressing aggression, violence, and mental health. The research landscape is large and interdisciplinary, with future research needing to cover environmental, socioeconomic, and systemic factors of public health even more. Enhanced interdisciplinary collaboration and embedding of hitherto less explored topics will play a decisive role in the further development of a comprehensive understanding of the complex issues at play. Novelty: The paper therefore carves out a distinctive bibliometric perspective on the evolution of research in psychology, aggression, and violence within the period 1994-2023, pointing not just toward the themes at the forefront, but also the emergent trends and lacunae in the literature. By identifying key areas of scholarly concentration and underrepresented areas, the analysis constructs a roadmap to future research and advances a more integrated approach toward resolving behavioral and public health problems.

Keywords: aggression, bibliometric analysis, lens.org, mapping, violence, VOSviewer

Introduction

Aggression can come in the form of verbal or physical acts, which can range from minor to serious hits and kicks, and punches (Archer, 2002). Another extreme form can result in violent and dangerous acts, such as stabbing or shooting and killing a person. Since there can be numerous levels and types of aggression, sometimes it can get tricky to figure out if a certain thing should be termed as aggressive or not. For instance, what one may consider a minor shove during an argument may be termed as a serious act of aggression in another circumstance. What makes understanding aggression even complicated is that people have a tendency to differ on what the concept means (Allen & Anderson, 2019; Neupane & Lourdusamy, 2024). The concept of aggression or violence can be viewed by the general public quite differently from what the scientist or psychologist defines (Neupane & Lourdusamy, 2024). In studying aggression, scientists often use specific, detailed definitions, while most people's understanding of aggression is based on personal experience or images from the media (Neupane & Lourdusamy, 2024; Mukred, et al., 2024). This is therefore a disparity between lay knowledge and scientific definition that may create confusion, hence making consensus on what really constitutes aggression or how it should be handled even more difficult.

Further, human aggression is a person's behavior enacted with the purpose of harming another individual. To be labeled as aggression, a behavior must be intentional; that is, the actor must believe that the action will result in harm to the target (Shewach & Sackett, 2024). The target of the behavior must also not want that behavior and would try to escape it if possible (Neupane, 2018). So, for example, in hitting someone else or insulting him, one acts intentionally, knowing very well that he does not want to be hit or insulted (Allen & Anderson, 2019; Neupane, 2015). It is this intention to hurt, combined with the other person's desire to avoid it, which constitutes aggression.

Although criminologists, political scientists, public policymakers, and the general public often distinguish violence as being distinct from aggression, social psychologists generally regard violence as an aggressive behavior (Arendt, 2016). More precisely, it can be viewed as a highly extreme form of aggression because the target typically includes a severely injurious or fatal outcome. Violence is, therefore, only a stronger manifestation of aggression with much graver outcomes than those of aggression (Englander, 2017). As with aggression, violence does not have to actually harm somebody for it to be considered violent (Davies, Engström, Pettersson, & Öberg, 2024). For example, if someone tries to stab another person but misses and the other person is not injured, this is still a violent act because the intent was there to cause serious harm (Neupane & Khanal, 2017; Peterson, Aslam, Rice, Gupta, & Kearns, 2024). It was not the fact that someone got hurt, but rather how extreme the real harm was, that labeled it as violent (Fazel, Burghart, Wolf, Whiting, & Yu, 2024; Siann, 2024). Even if nobody actually got hurt at the end, because there was an attempt to cause such extreme harm, it is now labeled as violent.

Anger and aggression have turned into the everyday features of life in modern times and result to hostility and violence. The intensity of these emotions is ceaselessly growing in persons, between family members, among groups, and even between nations (Singh & Misra, 2024). The alarming rate at which these feelings of anger and aggression continue to grow has brought in severe destruction: loss of life, contribution to environmental problems, and more health issues. Commonly, people use aggression to seize power, authority, and resources. It is aggravated in that the normal cultural systems that restrain or regulate behavior are being weakened. Consumerism and the drive to compete undercut such systems, and aggression can be allowed to grow. All in all, violence and negativity reach dangerous levels. Against this background, the chapter examines how social and cultural influences affect the feelings of anger and aggression. In addition, it looks at some of the different ways through which these issues can be handled. The main assertion here is that calming down anger and aggression, while nurturing peace and harmony, involves different approaches interplaying. It is not a single-solution problem, in the sense that a set of strategies will be required for effectively addressing the issue.

Problem Statement

While a lot of research on aggression-violence is carried out outside the boundaries of conventional disciplines, few studies have systematized knowledge of general trends, impact, and development of the overall field. Aggression and violence require mapping of the research landscape through a comprehensive bibliometric analysis: volume, growth patterns, influential publications, and key contributors. By such analysis, one may notice the gap in the literature, areas that have received high activity, and even the most impacting studies. Without a critical review, researchers and policy planners would not be aware of how knowledge of aggression and violence has evolved over time or where the under-explored areas lie and where future research needs to focus.

Objectives

Perform a bibliometric review of research publications on aggression-violence dated between 1994 and 2023. Identify the influential publications, authors, and journals in the field of aggression-violence studies. Discuss the geographical distribution of research into aggression-violence and explore collaboration networks. Analyze the citation patterns and point to which works have gained the most impact on the field. Similarly, to establish the gap in the literature and make recommendations for future research from among the identified current trends and developments.

Significance

The bibliometric analysis at hand would be significant, as it would provide an overall outlook on research into aggression and violence during the last three decades. Identification of highly influential studies and key contributors assists in guiding future research efforts to resource under-explored or emerging areas. Such analysis also identifies collaboration patterns and geographical contributions to aid in the promotion of international cooperation in research. This study contributes to policy development by decision-makers, scholars, and practitioners in aggression and violence issues addressed by the scientific community through making informed decisions from well-established and impactful research.

Materials and Methods

Source of Data

The bibliometric analysis is conducted based on the data retrieved from Lens.org, an advanced openly accessed scholarly database that encompasses the range from various academic works to patents. The use of Lens.org ensures coverage of scholarly works spanning disciplines like psychology, sociology, criminology, and other related fields that are major contributors to research in aggression and violence. The search is refined to journal articles only, as these are peer-reviewed and therefore high-quality contributions to the field. Articles published between January 1, 1994, and December 31, 2023, are surveyed.

Search Strategy

To identify relevant articles, a systematic search with specific keywords in the title, abstract, and keywords are utilized: "aggression" and "violence".

Filters include:

- Date of Publication: 1994-2023
- Type of Publication: Journal article
- External Identifier: Only the articles with a DOI are included in order to make the bibliography traceable and consistent.
- Citation Impact: The cited articles by other scholarly works are included in order to priorities impactful research.

Data Collection and Cleaning

Records are exported, after retrieval in an appropriate format -for example, CSV for analysis. The dataset includes bibliographic information such as:

- Title of the article
- Author(s)
- Journal name
- Year of publication
- DOI
- Citation counts
- Keywords

Cleaning entails the removal of duplicate entries and removal of irrelevant records to the study after data are collected. Examples of records that are removed from the dataset include conference papers that were included by mistake and non-scholarly articles. Partially incomplete records, such as an article not having a DOI, are also removed for consistency.

Bibliometric Analysis Tools

The bibliometric analysis is conducted with the use of two software tools including:

VOSviewer: Software tool that develops the visual structure of networks of bibliometric data on co-authorships, co-citations, and keyword co-occurrence maps. In this research, VOSviewer is utilized to map the networks of collaboration, identify highly recognized authors, and establish keyword clusters in the research on aggression and violence.

Analytical Approach

The following dimensions of analysis are focused on:

Trend Analysis: The growth of publications on aggression and violence is analyzed every year to identify how research in this area has developed over time.

Authors and Institution Networks: Most productive authors and institutions are identified. Coauthorship analysis maps collaboration networks among the researchers.

Citations and Impact: The number of citations is used to determine the highly cited studies and authors. Calculations of the h-index, total citations, and average citations per publication are performed to analyze impact.

Journal Analysis: The top journals that publish research on aggression and violence are determined using the quantity of articles and citations.

Trends in Keywords and Topics: A keyword co-occurrence analysis is conducted to identify the major themes and emerging topics in aggression and violence research over the years.

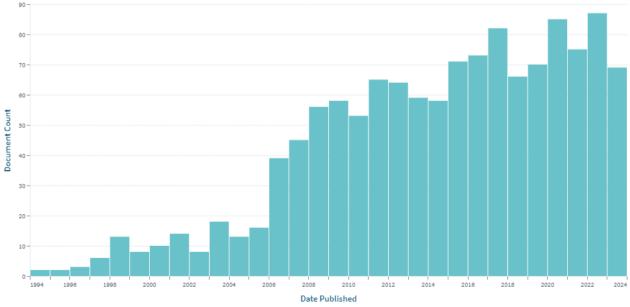
Data Visualization

The results of the bibliometric analysis are presented by means of applying: Trend graphs, showing development regarding the number of publications over time. Co-authorship and collaboration network maps, showing research partnerships of authors and institutions.

Thematic maps and keyword clusters highlight the preferred topics of research and how they are related. Citation graphs give evidence of highly cited papers in the area and their authors.

Limitations

Considering only the DOIs of journal articles in peer-reviewed journals, there is the possibility that the analysis might not cover older works or those appearing in journals not listed with DOI. Only the articles cited by other scholarly works have been included for analysis, which may omit new research works that might not have citations.



Results and Analysis

Source: VOSviewer

Figure 1Number of Publications over Time

Figure 1 represents the number of scholarly publications throughout the years.

Time-related growth: The graph indicates a fantastic growth in the publications starting from the beginning of the 2000s. Such gradual growth could point to the ever-growing academic and social concern for aggression and violence. By the year 2000, there were very few publications, and until then, the frequency of the documents was just above 10 annually. Starting in 2003,

however, this publication rate started to grow, reaching an apex around the year 2022 with a total of almost 90 documents.

Sharp Increases: While the rate of publication generally remained high between 2010 and 2020, sometimes spiking. For instance, strong peaks like those in 2015, 2021, and 2022 may indicate that certain events globally or regionally have caused increased scholarly attention to be attracted to the area. These leaps may be due to notorious events such as social movements, political turmoil, or crises that have raised the level of public discourse on aggression.

Recent Focus: The peak in 2022 may indicate that aggression and violence have become more urgent or studied problems, likely in relation to relevant global events such as pandemics, civil unrest, or political disputes. This could show an increased concern about the prevalence of, and violence associated with such acts.

From a critical point of view, this dataset speaks to larger social trends. It could be the case that in recent times, the issues of aggression and violence have become more identifiable as significant problems that affect such a large number of aspects of life. It is also possible that research in this area achieved a level of newfound focus in the early 2000s, due to global conflicts, terrorism on the rise, or possibly even social inequalities gaining visibility.

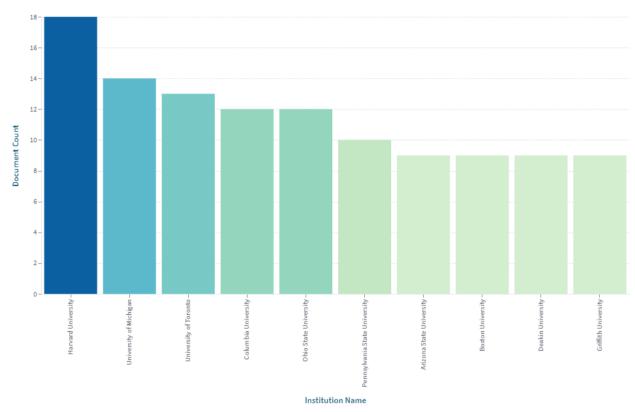
Such research growth may also reflect the academic recognition of the complexity and ubiquity of violence physical, structural, or psychological in nature. It could also involve direct violence, but also institutional aggression in forms of systemic racism, poverty, and gendered violence. Since the world is becoming increasingly globalized, framing violence as a worldwide problem that requires solutions across disciplines is increasingly common.

This may, from a more creative perspective, reveal that the trending narratives in society are changing. There have been significant technological, social, and political changes in the world, many of which escalate tensions. In this respect, by using digital tools, scholars and other researchers have become better prepared to investigate the psychological and social underpinnings of violence, share their findings, and put forward new solutions. In a sense, this graph reproduces the turmoil of modern life and demonstrates that research into aggression followed the ups and surges of societal unrest.

These peaks and troughs of publication can, for instance, be envisioned as bursts of human conflict, with each peak representing a moment of intense focus where aggression is inevitable. The difference between peaks may point out temporary resolutions or shifts in focus, although the trend upward does indicate that aggression and violence are present concerns that society has yet to resolve.

This growing body of work points to the need for continued inquiry into unraveling the causes of aggression and how creative, nonaggressive solutions will continue to dampen its effect. Further scholarship could also build on these findings in support of interventions that challenge traditional power structures and create more equitable, peaceful societies.

In all, the graph chronicles more than the academic study of aggression and violence; it reflects the contemporary human condition in which aggression continues to be a theme and a matter for debate across several disciplines.



Source: lens.org

Figure 2:Academic Institutions

Figure 2: This is the bar chart of top contributing academic institutions to the body of scholarly work on aggression and violence.

Leading Organization - Harvard University: With close to 17 published documents, Harvard University leads the contributions. Certainly, its strong academic resources, interdisciplinary approach, and historical emphasis on understanding societal issues such as violence from both a socio-political and psychological point of view place it in the lead in this area of research.

Close Competitors: These are the University of Michigan with 12-14 documents, the University of Toronto with 12-14 documents, and Columbia University, also with 12 to 14 documents. All these universities have extensive research programs and thus would likely have devoted resources to the cause of aggression and violence and its impact on society.

Other Major Contributors: Ohio State, Penn State, ASU, and Boston University all published about 10 documents each. This reflects the broad nature of interest in this topic both at prestigious research universities and public institutions. These universities are likely drawing upon a variety of disciplinary expertise in the creation of the violence-themed literature.

International participation: The Australian institution of Griffith University features the international actor's participation in academic discourses of aggression and violence. This is a reflection of the global nature of the issue and the international collaboration required toward complex societal problems such as violence.

A critical standpoint may suggest that, regarding research on aggression and violence, the dominance by prestigious Western institutions, such as Harvard and Michigan, may indicate resource inequalities within global academia. The universities often receive better funding, larger research teams, and access to a wider range of academic publications and networks. However, this focus on violence alone might result in the narrative being skewed towards one perspective-that which emanates from the Global North-at the expense of contexts, solutions, and nuances peculiar to violence in the Global South.

The presence of institutions such as Griffith University may show a token of diversification in research, but the chart is weighted in a Western, Anglophone perspective. Consequently, there should be a question of representation in academic discourse-that is, how well are these studies reflections of the lived realities of violence in non-Western or otherwise marginalized communities?

Less literally, this skew in research productivity raises some questions about academic incentives. Are these universities responding to a growing visibility of violence and aggression in media, politics, and social movements? Or is it possible that the focus has devolved onto aggression and violence because they are quantifiable, high-impact themes that secure funding, in particular in public health, law, and psychology?

Indeed, these are the same institutions that shape policy; research outputs influence how governments, NGOs, and social movements deal with aggression and violence. A question, then, would be: How do the research outputs in such universities translate into action? Do these publications contribute to a reduction in violence, or does the academic community, due to a lack of confrontation with deeply embedded social inequalities, inadvertently maintain structural issues that allow aggression to persist?

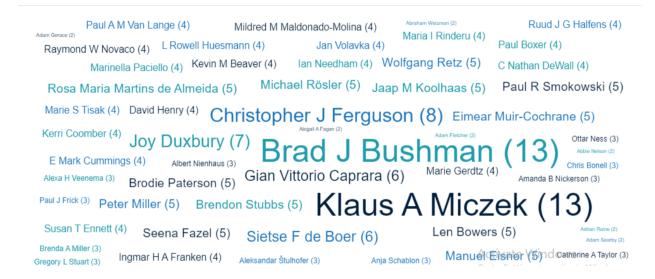
It points, in a nutshell, to the need for continued research into aggression and violence, while fostering critical reflection about whose ideas are informing that research, whose voices are being amplified, and how such knowledge is being utilized in practice.

Figure 3 is a word cloud, or frequency map, of leading scholars in the research field of Aggression and Violence. The most prolific academics include Klaus A. Miczek and Brad J. Bushman, with "13" next to their names, indicating that they have contributed the most in terms of the number of publications or number of citations in this area. Both are known for their extensive works on topics such as aggression, violence, and behavioral psychology. Their strong presence indicates that they are major contributors to setting the directions of research on aggression.

Other major contributors include Christopher J. Ferguson 8, Joy Duxbury 7, Sietse F. de Boer 6, and Peter Miller 6. These researchers have considerably contributed to understanding the

various dimensions of violence, including its psychological, societal, and biological underpinning.

The diversity inherent in the names themselves, Rosa Maria Martins de Almeida, Wolfgang Retz, Sietse F. de Boer, and Gian Vittorio Caprara, serves to underscore the international nature of research into aggression and violence. It underlines the point that aggression as a field of study is an international enterprise involving scholars from many different countries and many different disciplines.



Source: lens.org

Figure 3: Prominent Authors

It also underlines a range of researchers with more modest contributions, represented in smaller font names such as Paul Boxer, Alexa H. Veenema, and E Mark Cummings, with 4-5 publications each, or equivalent numbers of citations in this domain. That is, while the field has obvious luminaries, there is an even greater number of scholars developing the general interest in aggression and violence.

This word cloud is simultaneously a testimony to the productivity of some scholars and a projection of the structure of academic influence in the studies on aggression and violence. Inasmuch as a few names come out larger in the word cloud, the subtle implication that the cloud conveys-Klaus A. Miczek and Brad J. Bushman as foundational voices around whom much of the discourses revolve-is essentially an issue of the concentration of influence.

Such visualization could be critical, from a philosophical point of view, to the academic dynamics that gives too much power to certain individuals. The central presence of a few names does indicate indeed a concentration of intellectual authority that is enabling yet disabling at the same time. No doubt, figures like Miczek and Bushman have created paths that might have been opened before with their work and thus opened ways to deeper understanding and further research. But it also does run a very strong risk of, over time, becoming overly reliant on just

a few key voices and perhaps even pushing less familiar-but-other original-thought perspectives to the periphery in favor of consistency with accepted paradigms.

This cloud reflects the intersectionality of academic research, wherein many mid-level contributors act to bridge the gap between leading scholars and the voices of emergence. The mid-sized names would, therefore, suggest an ecosystem of collaboration whereby different researchers are contributing to subfields within the greater topic of aggression and violence. It is this interplay among established and emerging scholars that forms the very core of academic dynamism, ensuring that ideas can be presented, critiqued, and new theoretical approaches put forward.

This word cloud structure can also be metaphorically realized in the nature of power dynamics at play within academia: the largest names there are not only representative of those who contribute the most research but also are likely to hold the most influence in what does or does not get published, is funded, or prioritized. These names are perhaps guardians or gatekeepers to the academic debate on issues related to aggression and violence, whereas smaller names may be the ones that have valuable research to contribute but do not bear as much authority or visibility within the field.

This word cloud, for future research, points to further collaboration, perhaps with more diversification in thought leadership. The entrance of new voices and interdisciplinary approaches could challenge current thinking about aggression and move beyond the frameworks set by the most prominent.

In sum, this visualization maps not only the academic landscape of aggression and violence research but also the ways in which this area has taken up key issues of balanced intellectual leadership. While intellectual leaders provide necessary insights, more inclusive research environments provide needed diverse and innovative perspectives that allow new ideas to surface continuously to shape the future direction of the area of study.

Figure 4 is a word cloud of keywords. It gives key topics; these are on the frequency of scholarly works, research, or discussions between 1994 and 2023. Larger words reflect more prominent topics or those more frequently addressed.

Psychology is the most outstanding word; it, therefore, means that it must be the point of concentration in most of the scholarly works that are represented in this tag cloud. This means that a greater portion of the research, articles, or discussions have been focused on psychological theories, behavior, and mental health.

Aggression, 661, is a major area of study in view of its closeness to psychology, probably because it has to do with the understanding of human behavior, mental health conditions, and societal issues like violence and conflict.

Poison control is another big term, 541, indicating major emphasis on public health, especially in management toxic exposure and prevention whether medically emergent, environmentally hazardous, or even substance abuse.

Medicine follows with 425 entries, showing a good cross-section of psychological and medical fields. This reflects the integration of mental health within wider healthcare frameworks-such as psychiatric care or behavioral medicine.



Source: lens.org

Figure 4: Keywords

Other key foci include Suicide prevention, 320; Injury prevention, 287; Developmental psychology, 287; and Psychiatry, 348. These suggest a focus on harm reduction, mental health crises, and developmental issues that are important areas for both basic research and clinical intervention.

For example, social psychology would account for 284, Clinical psychology for 337, while Occupational safety and health accounts for 176; all these suggest that the scope of psychology extends beyond individual behavior into group dynamics, workplace safety, and societal wellbeing.

That fact alone speaks volumes about the pervasiveness of the general effects that psychological research has had on understanding human behavior, emotion, and social interaction. Interdisciplinary elements in fields like medicine and nursing further point to the belief that mental and physical health cannot be separated.

This dominance makes explicit a necessary indication of the importance of psychology. However, it might also be overemphasizing the importance of the individual-level factor in invoking aggression, violence, or suicide prevention at a societal level. A more cautious balancing may involve giving greater attention to the place of structural and systemic factors, such as poverty and inequality, contributing to the root of these problems. The high representation of aggression, 661, as a major theme and poison control, 541, would indeed seem to indicate the very strong interest in understanding harmful behavior and in preventing dangerous situations, whether due to psychological aggression or physical hazards such as toxic substances.

Aggression research needs to be conducted, but one could question the degree of the emphasis that this represents in a larger context because of an interest in pathology and destructive behaviors perhaps at the expense of the investigation of positive human attributes, such as resilience or empathy, and proactive health strategies. The poison control section receives warranted considerable attention, but does this suggest that lower-priority public health matters, for instance preventing chronic diseases, may not get the same level of focus?

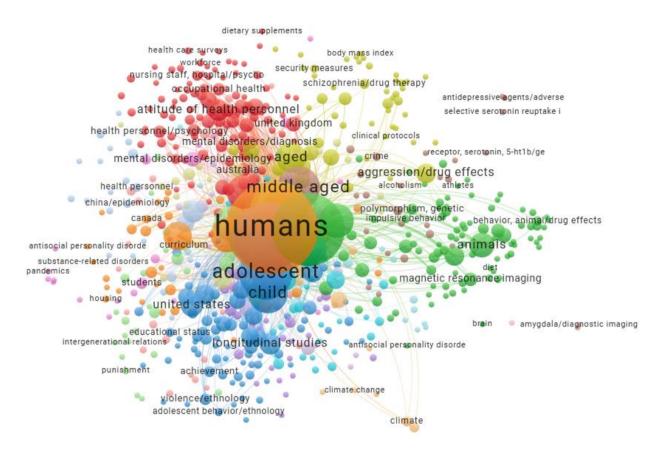
The word cloud is completed by terms such as suicide prevention (320), injury prevention (287), and occupational safety and health (176); this would tend to indicate that quite a great part of scholarly work was devoted to preventing harm-promoting safety in various respects, from the mental health crisis to the workplace environment. It is good that the focus is on prevention, and that is where it should stay for better public health outcomes. However, such prevention can always be extended by exploring further into the causative element for these issues. For example, injury and suicide prevention might necessitate further exploration in terms of risk factors that are related to society, such as economic disparities, access to healthcare, or discrimination.

However, a few keywords are relatively small in the word cloud and include environmental health, which had 69 hits, substance abuse with 27, and applied psychology with 26. These are areas that are quite significant both in public health and psychological research; however, they bear less prominence in comparison with others such as aggression or psychiatry. The apparent underrepresentation of environmental health and substance abuse in this sample may suggest that these are underserved areas of research. For instance, environmental health is increasingly relevant in the contexts of climate change and industrial pollution but also indirectly for its implications on mental health through environmental stressors. Substance abuse, since it is a widespread occurrence in individuals and communities, perhaps has merited a higher priority from the standpoint of public health and social psychology.

The presence of political science and sociology indicates that, to a certain extent, there is some recognition of sociopolitical and cultural factors affecting human behavior and mental health; however, these are not as great when compared with psychology or medicine. While much important work has been and will continue to be done by psychology and medicine, the most critical factors shaping behaviors of both individuals and groups often depend on larger-scale social and political factors. The relative smallness of sociology and political science in the word cloud suggests that these broader factors may be insufficiently explored or integrated into research on mental health. Where prevention of violence or public health is concerned, for instance, knowledge of cultural, political, and economic contexts are vital in properly understanding how best to address such issues.

Thus, the word cloud shows great preoccupation with psychological and behavioral research, even more so on issues of aggression, mental health, and public safety. While this shall be important, it tells of a dominance of the scholarly discourse by an individual and clinical perspective, probably at the expense of systemic, sociopolitical, and environmental factors that

also have crucial roles to play in those fields. Future research could therefore be expanded to include not only more holistic approaches that encompass environmental health, social justice, and cultural studies but also further studies in psychology, psychiatry, and medicine.



Source: VOSviewer

Figure 5:Networks of Scholars and Themes

Figure 5, VOSviewer network visualizations present the relations of diverse concepts or terms that occur in data, often originating from scientific literature. Each node on the map represents one keyword or concept, and the lines between them represent relationships or co-occurrence. The size of the nodes refers to frequency of occurrence, and the colors refer to different clusters of concepts related to each other.

The word "human" is the most central and largest node in the middle of the visualization, meaning this is the most common concept within this dataset. That would mean that this research is highly based on human subjects. Supporting terms like "adolescent", "middle aged", "child" etc. emphasizes that much of the research focuses on different age groups of humans and their characteristic or behaviors.

The red cluster includes "attitude of health personnel," "mental disorders," and "epidemiology." These are closely related to themes on public health, most probably researching the relationship of health professionals with their patients, diagnosis, and research into mental disorders, and

the spread of diseases. With terms like "nursing staff" and "occupational health," a focus on health professionals and their mental health or behavior would likely be indicated.

The green cluster, right, incorporates terms like "aggression," "drug effects," and "animals." From this, it seems that one of the large areas of studies is in the investigation of the effects of drugs or other influences on aggressive behavior, maybe both on humans and animals. Concepts such as "magnetic resonance imaging" (MRI) and "genetics" suggest that some studies are focused on the biological or neurological basis of aggression and behavior.

The clusters of blue and orange terms near the bottom include "students," "educational status," and "adolescent behavior." These are very likely to reflect studies about education and achievement and could represent the social behaviors of younger populations. Moreover, there is an emphasis on longitudinal studies, in which individuals are followed over long periods, possibly for the study of their development or behavior change.

Other nodes include global issues: "pandemics," "climate change," "housing," which explains that the dataset encompasses even wider areas of interest, societal and health concerns. Keywords such as "violence" and "antisocial personality disorder" indicate research on societal issues like crime and mental health. There is everything from very general subjects to very specific ones, which speaks to great diversity in the research themes touching on health, social behaviors, and environmental aspects. Thus, this is a big field of research; it deals with issues like human behavioral and health matters and has subthemes touching on aspects such as aggression, mental health, education, and global challenges.

Conclusion

This bibliometric study conducted into research on aggression and violence during the period 1994-2023 reveals that there are clear identifiable trends and patterns in the research field. In fact, it indicates a growing interest among scholars to understand the multi-dimensional nature of aggression and violence, prompted by a rise in societal concerns, advances in the methodology for conducting research, and inter-disciplinary collaboration. Dominant themes emerged, including the psychological, sociological, and public health dimensions of aggression, with notable attention to prevention strategies and influences of digital media on violent behavior. The review also enumerated some leading researchers and foundational works that have helped frame the discourse in these areas and underlined how aggression and violence are interconnected across disciplines in complex ways.

Recommendations

• Future research should continue to encourage collaboration across disciplines: psychologists, sociologists, experts in public health, and educators to develop comprehensive programs that address the complexity of aggression and violence. Researchers can then give attention to the holistic development of interventions which take into consideration psychological, environmental, and social perspectives.

- There is, therefore, an urgent need for prevention-emphasizing studies, especially among vulnerable youth. This research needs to be channeled into effective intervention programs in schools, communities, and digital platforms that may help mitigate the risk of aggression and violence.
- The most modern technologies should be utilized to the fullest by the researchers to upgrade data collection and analysis. Big data, machine learning, and social media analytics will allow a deeper insight into the patterns of aggression and violence with a view to informing targeted interventions.
- Longitudinal studies, which follow individuals over a period of time, stand to reveal long-term effects on mental health and societal well-being as influenced through aggression and violence. Such findings can help in decision-making at the policy level and development of programs aimed at responding to the root causes of these kinds of behaviors.
- Future research should take into consideration those sociocultural variables that influence aggression and violence, such as status and position regarding socioeconomic class, norms of culture, and systemic inequalities. The essence of their understanding is in the elaboration of efficient equitative strategies of fighting off aggression and violence at all levels.

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