

Media-Based Cognitive Warfare and Its Mental Health Consequences: A Scoping Review of Anxiety, Depression, and PTSD

Abstract

Aims: Cognitive warfare has emerged as a modern form of conflict in which media platforms are used to influence perceptions, induce psychological pressure, and weaken societal resilience. Continuous exposure to war-related news, threatening narratives, and misinformation may contribute to adverse mental health outcomes in civilian populations. This scoping review aimed to synthesize available evidence on the psychological consequences of media-based cognitive warfare, with a focus on anxiety, depression, and PTSD.

Instruments & Methods: A scoping review was conducted on Persian and English studies published between 2000 and 2025. Searches were performed in PubMed, Web of Science, Scopus, SID, and MagIran using keywords related to cognitive warfare, media exposure, and mental health outcomes. After screening 250 records and applying inclusion and exclusion criteria, eight studies were selected. Data were extracted and synthesized descriptively due to methodological heterogeneity.

Findings: Across the reviewed studies, exposure to war-related media content was consistently associated with increased anxiety, depressive symptoms, PTSD manifestations, hypervigilance, intrusive thoughts, and reduced perceived safety. Vulnerable groups including older adults, adolescents, and individuals with occupational exposure to traumatic media showed heightened susceptibility. Two primary mechanisms were identified: (1) cognitive overload and emotional erosion caused by continuous threat-based messaging, and (2) secondary trauma induced by indirect exposure to violent imagery.

Conclusion: Media-based cognitive warfare exerts measurable psychological effects on civilian populations, contributing to anxiety, depression, and trauma-related symptoms. Strengthening media literacy, enhancing psychological resilience, and developing responsible media policies are essential strategies to mitigate these impacts and support public mental health.

Keywords: Cognitive Warfare; Media Exposure; Misinformation; Anxiety; Depression; PTSD; Mental Health

Introduction

Mental health disorders represent one of the most significant global public health concerns of the contemporary era. According to estimates from the World Health Organization (WHO), more than one billion individuals worldwide suffer from mental disorders, with anxiety and depression constituting a substantial proportion of this burden^[1]. The situation is even more severe in regions affected by armed conflict, where approximately one in five individuals experiences mental health problems ranging from anxiety and depression to more severe conditions such as post-traumatic stress disorder (PTSD), often impairing daily functioning and access to care^[1, 2]. Alongside the traditional psychological consequences of war, rapid developments in information and communication technologies have contributed to the emergence of a new form of conflict known as cognitive warfare. Unlike conventional warfare, cognitive warfare directly targets mental processes, perceptions, and decision-making, positioning the human mind as both a weapon and a battlefield^[3]. The expansion of social media platforms, behavioral targeting algorithms, and artificial intelligence has amplified the reach and impact of cognitive warfare. The organized dissemination of misinformation, manipulated narratives, and emotionally charged content often deployed strategically during crises, can influence public opinion and undermine psychological stability^[4]. This dynamic was evident during the post-2022 Ukraine conflict, where a “flood of conflicting narratives” circulated with the aim of eroding public trust and increasing uncertainty^[5]. Psychological research increasingly highlights the mental health consequences of such exposure. Repeated contact with negative news, violent imagery, and threat-laden information has been associated with heightened anxiety, depressive symptoms, and trauma-related reactions, even among individuals geographically distant from the conflict^[6, 7]. Media exposure can therefore function as a form of secondary trauma, replicating aspects of the war experience and blurring the boundary between physical and psychological proximity to conflict^[8, 9].

Despite the growing recognition of cognitive warfare as a strategic tool, relatively few studies have systematically examined its psychological consequences within the general population. Existing research often focuses either on defining cognitive warfare tactics^[3] or on the broader mental health

effects of media exposure during crises^[10-12], without integrating these domains into a unified analytical framework. As hybrid threats and information-based operations increasingly shape modern security environments, understanding the mental health implications of media-driven cognitive warfare has become a critical priority for public health and national resilience.

Accordingly, the present study conducted a Scoping Review to synthesize available evidence on the psychological effects of media-based cognitive warfare on civilian populations, with a specific focus on anxiety, depression, and PTSD. By mapping existing findings and identifying vulnerable groups and underlying mechanisms, this review aims to provide a clearer understanding of how cognitive warfare influences population-level mental health and to inform future preventive and policy strategies.

Instrument and Methods:

This study was conducted as a Scoping Review to map and synthesize existing evidence on the psychological consequences of media-based cognitive warfare on civilian populations. The methodological approach followed the framework proposed by Arksey and O'Malley and later refined by Levac et al.^[13], as well as the PRISMA-ScR (Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews) guidelines^[14]. This approach was selected due to the conceptual diversity and methodological heterogeneity of studies addressing media exposure, cognitive warfare, and mental health outcomes.

Search Strategy

A comprehensive and systematic search was performed to identify relevant studies published between January 2000 and December 2025. This timeframe was chosen because the conceptualization of cognitive warfare and the expansion of digital media ecosystems have evolved significantly over the past two decades. Searches were conducted in the PubMed, Web of Science, Scopus, Scientific Information Database (SID), and MagIran electronic databases.

The search strategy combined controlled vocabulary and free-text terms related to cognitive warfare, media exposure, and mental health outcomes. Keywords included: "Cognitive Warfare," "Psychological Warfare," "Information Warfare," "Media Exposure," "Misinformation," "Anxiety," "Depression," "Post-Traumatic Stress Disorder," "PTSD." Boolean operators AND and OR were used to expand or narrow the search as appropriate.

Eligibility Criteria

Studies were selected based on predefined inclusion and exclusion criteria. Studies were included in this review if they examined any aspect of media exposure related to war, conflict, or cognitive warfare and reported at least one psychological outcome relevant to the general population, such as anxiety, depression, PTSD, stress, hypervigilance, or intrusive thoughts. Eligible studies were required to focus on civilian groups including adolescents, adults, and older adults and to be published in English or Persian with full-text availability. Both quantitative and qualitative designs, as well as review articles that addressed the psychological consequences of war-related media content, were considered appropriate for inclusion.

In contrast, studies were excluded if they focused exclusively on military personnel, soldiers, or combatants, or if they addressed only the technical, strategic, or operational dimensions of cognitive warfare without examining mental health outcomes. Articles lacking sufficient methodological detail, those without measurable psychological variables, and publications such as letters to the editor, commentaries, conference abstracts, and case reports were also excluded from the review.

Study Selection Process

The initial search of PubMed (n=110), Scopus (n=90), and Web of Science (n=50) yielded a total of 250 records. After removing 40 duplicate records and excluding a further 151 records prior to screening due to non-English language, editorial materials, or unavailability of full text 59 unique records proceeded to title and abstract screening. Of these, 39 records were excluded because they were irrelevant to the topic or used an inappropriate study design. The remaining 20 full-text articles were assessed for eligibility. During full-text review, 12 articles were excluded for the following reasons: no specific focus on media cognitive warfare (n=5), absence of psychological outcomes such as anxiety, depression or PTSD (n=4), full text not retrievable (n=2), and publication outside the predefined timeframe (2015–2026, n=1). Consequently, 8 studies met all inclusion criteria and were included in the scoping review. The study selection process adhered to the PRISMA Extension for Scoping Reviews (PRISMA-ScR) guidelines and is presented in the PRISMA flow diagram (Figure 1)

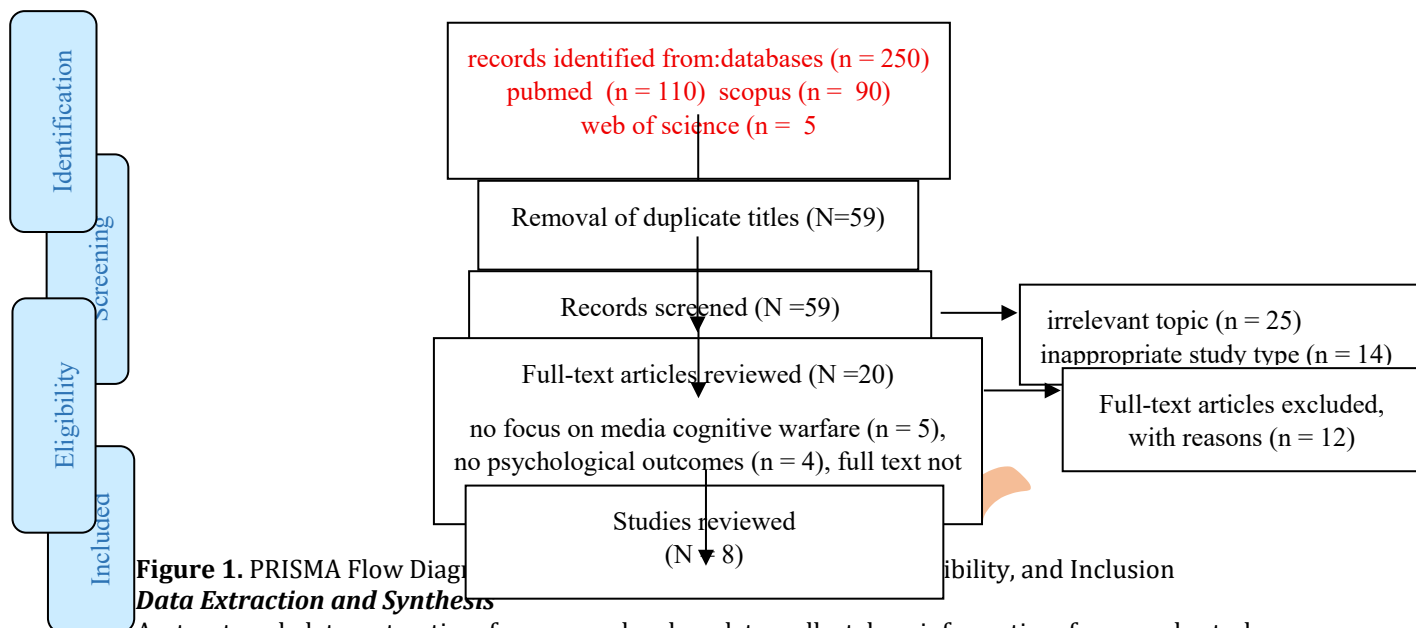


Figure 1. PRISMA Flow Diagram

Data Extraction and Synthesis

A structured data extraction form was developed to collect key information from each study, including:

- Author and year
- Country and population
- Study design
- Type of media exposure
- Psychological outcomes measured
- Key findings related to anxiety, depression, and PTSD

Due to substantial heterogeneity in study designs, populations, and assessment tools, meta-analysis was not feasible. Therefore, findings were synthesized using a qualitative thematic approach, allowing identification of recurring psychological outcomes and underlying mechanisms such as cognitive overload, emotional erosion, and secondary trauma.

Findings:

All eight studies included in this scoping review were published between 2024 and 2025. In terms of study design, six were cross-sectional studies, one was phenomenological, one was a narrative review, and one was a systematic review. The studies were conducted in Egypt, Turkey, Ukraine, Arab countries, Palestine, Israel, and one study had an international population. The populations examined included adults, adolescents, older adults, and journalists. All studies investigated the psychological consequences of exposure to media content related to war and conflict, and consistently emphasized the role of media-based cognitive warfare in inducing or exacerbating anxiety, depression, post-traumatic stress disorder, emotional distress, and impaired cognitive processing. The theoretical framework of most studies focused on indirect trauma transmission, informational uncertainty, and the exploitation of fear as tools of cognitive warfare through media (Table 1)

Table 1. Characteristics and Key Findings of the Studies Included in the Scoping Review

No.	Author / Year	Study Country	Study Design	Research Focus	Results
1	Abd El Fatah NK et al., 2025 [15]	Egypt	Cross-sectional	Exposure to war-related media among older adults	Exposure to war-related news through digital media was associated with higher levels of stress, intrusive thoughts, generalized anxiety, rumination, and persistent sense of threat. Older adults demonstrated reduced cognitive coping capacity and were more vulnerable to information-induced psychological distress, indicating a cognitive warfare-like impact through continuous threat messaging.
2	Güler KG et al., 2025 [16]	Turkey	Phenomenological	Psychological experience of war-news exposure in	The study revealed anticipatory fear, social anxiety, uncertainty-driven worry, and emotional dysregulation. Participants attributed distress to constant bombardment of threat narratives, suggesting a cognitive warfare

				general population	component via fear amplification and manipulation of perceived insecurity.
3	Kesner L et al., 2025 [17]	Ukraine	Narrative Review	Media uncertainty during Ukraine conflict and mental health	Continuous exposure to highly uncertain media narratives led to elevated anxiety, depressive symptoms, PTSD, emotional exhaustion, and disrupted cognitive processing. The authors highlighted how uncertainty framing functions as an information-based stressor typical of cognitive warfare strategies.
4	Fekih-Romdhan F et al., 2024 [18]	Arab countries	Cross-sectional	Mediating role of stress and depression in war-news exposure	War-related media consumption significantly increased perceived stress, depressive symptoms, hyperarousal, and insomnia. Disruption of sleep was linked to persistent vigilance induced by threat information, reflecting cognitive warfare effects through neuromodulation of arousal and emotion regulation pathways.
5	Abu-Elenin et al., 2025 [19]	Palestine	Cross-sectional	Impact of war visual media on adolescents	Exposure to war visuals on social platforms was associated with increased anxiety, depressive affect, emotional withdrawal, and decreased sense of safety. Adolescents exhibited heightened sensitivity due to ongoing cognitive load and fear-inducing imagery, aligning with cognitive warfare models targeting emotional and cognitive development.
6	Mohammed et al., 2025 [20]	International	Systematic Review	Mental health of journalists covering war	Journalists directly exposed to war information experienced PTSD, anxiety, depressive disorders, emotional exhaustion, and burnout. The study discussed how forced engagement with traumatic content constitutes occupational cognitive warfare exposure, where psychological resilience is eroded through repetitive trauma-linked informational inputs.
7	Dahan et al., 2024 [21]	Israel	Cross-sectional	Media exposure and post-traumatic responses	War media exposure significantly increased PTSD symptoms, hypervigilance, intrusive memories, and generalized anxiety. Authors conceptualized media content as secondary trauma transmission—a mechanism commonly embedded in cognitive warfare via indirect psychological targeting.
8	Polyvianai et al., 2025 [22]	Ukraine	Cross-sectional	Mental health consequences of war-news exposure	Symptoms of major depressive disorder, generalized anxiety, PTSD, irritability, and somatic complaints were reported. The authors emphasized how media amplified perceived insecurity and future threat, reflecting cognitive warfare strategies of psychological destabilization of civilian populations.

Across the reviewed literature, exposure to war-related media content including news reports, violent imagery, and threat-laden narratives was consistently associated with a range of adverse psychological outcomes. The most frequently reported consequences included increased anxiety, depressive symptoms, and PTSD manifestations. Several studies also highlighted elevated levels of hypervigilance, intrusive thoughts, rumination, and a persistent sense of threat, indicating that media exposure can replicate aspects of the war experience even in the absence of direct physical danger^[12, 16, 23, 24].

Older adults demonstrated heightened vulnerability. Abd El Fatah et al. reported that continuous exposure to digital war news was associated with elevated stress, generalized anxiety, intrusive thoughts, and reduced cognitive coping capacity among elderly individuals^[15]. Similarly, Güler and colleagues found that adults exposed to repetitive war narratives experienced anticipatory fear, emotional dysregulation, and uncertainty-driven worry, suggesting that media can function as a psychological amplifier of threat^[16]. Narrative evidence from Ukraine further emphasized that media-induced uncertainty contributes to emotional exhaustion, depressive symptoms, and disrupted cognitive processing^[17].

Studies conducted in Arab countries and Palestine revealed that adolescents and young adults are particularly susceptible to media-related psychological distress. Fekih-Romdhane et al. demonstrated that exposure to Israel-Gaza war coverage increased perceived stress, depressive symptoms, hyperarousal, and insomnia^[25]. Abu-Elenin et al. similarly reported that adolescents exposed to violent war imagery experienced heightened anxiety, depressive affect, emotional withdrawal, and diminished perceived safety^[19]. These findings align with the concept of secondary trauma, wherein individuals develop trauma-like symptoms through indirect exposure to conflict^[24]. Professional groups with repeated exposure to traumatic media content also demonstrated significant psychological burden. Mohammed's systematic review showed that journalists covering war and conflict frequently experienced PTSD, anxiety, depressive disorders, and emotional exhaustion due to continuous engagement with traumatic material ^[18]. Likewise, Dahan et al. reported that mental health workers exposed to war-related media during the Israel-Hamas conflict exhibited elevated anxiety, hypervigilance, and secondary trauma symptoms ^[19]. Polyvianaia et al. further documented increased depressive symptoms, anxiety, PTSD manifestations, irritability, and somatic complaints among university students exposed to prolonged war-related media coverage in Ukraine^[26].

Overall, the synthesis of findings indicates two primary mechanisms through which media-based cognitive warfare affects mental health: 1- cognitive overload and emotional erosion resulting from continuous exposure to threat-based and uncertain narratives^[12, 17, 25], and 2- secondary trauma triggered by indirect exposure to violent or distressing imagery^[19, 24, 26]. These mechanisms were observed across multiple demographic groups, suggesting that media-driven cognitive warfare exerts broad and significant psychological effects on civilian populations. Figure 2. Conceptual model illustrating the two primary psychological mechanisms through which media-based cognitive warfare affects mental health. Continuous exposure to threat-laden or uncertain narratives leads to cognitive overload and emotional erosion, resulting in anxiety, depression, and stress-related symptoms. Indirect exposure to violent or distressing imagery triggers secondary trauma, contributing to PTSD-like manifestations, hypervigilance, and emotional withdrawal. Together, these mechanisms increase the psychological burden on civilian populations.

Discussion

The findings of this scoping review demonstrate that exposure to war-related media content exerts significant psychological effects on civilian populations across diverse cultural and geographical contexts. Consistent evidence from the included studies indicates that media functions not merely as a channel of information but as a conduit through which the psychological experience of war is transmitted, often replicating the emotional and cognitive burden of direct exposure to conflict. This phenomenon aligns with the conceptual framework of cognitive warfare, wherein information is strategically used to influence perceptions, induce emotional distress, and weaken societal resilience^[3, 5]. Recent population-based studies on the Russo-Ukrainian War further demonstrate that intensive war-related news consumption is a robust predictor of psychological distress, including elevated anxiety, depression, and post-traumatic symptoms, independent of objective war proximity, supporting the idea that media can generate a "bystander war syndrome"^[27]

Across the reviewed studies, anxiety, depressive symptoms, and PTSD-related manifestations emerged as the most prevalent outcomes of media exposure. These findings are consistent with prior research demonstrating that repeated exposure to negative or threatening media content can heighten emotional arousal, amplify perceived insecurity, and contribute to chronic psychological distress^[6, 7]. For example, older adults exposed to continuous digital war news exhibited elevated anxiety, intrusive thoughts, and reduced coping capacity^[12], while adults in Turkey reported anticipatory fear and emotional dysregulation in response to persistent threat-laden narratives^[16]. These patterns suggest that media can act as a secondary trigger of the war experience, blurring the boundary between physical and psychological proximity to conflict.

A national survey in Portugal showed that media-based exposure to the Russian-Ukrainian war was significantly associated with stress, anxiety, and depressive symptoms, particularly among

individuals spending more than one hour per day on war news, thus empirically reinforcing the dose-response relationship between media exposure and mental health deterioration [28]

A notable finding of this review is the heightened vulnerability of specific demographic groups. Adolescents exposed to violent war imagery demonstrated increased anxiety, depressive affect, and emotional withdrawal^[19], likely due to developmental sensitivity and the pervasive nature of digital media in their daily lives. Similarly, journalists and mental health workers who are repeatedly exposed to traumatic content as part of their professional roles exhibited elevated levels of PTSD, anxiety, and emotional exhaustion^[20, 24]. These observations highlight the cumulative psychological burden associated with prolonged exposure to conflict-related media and underscore the need for targeted interventions for high-risk groups.

Studies on adolescents exposed to media coverage of armed conflict in the Middle East reported that higher use of social media and visual platforms strongly predicted post-traumatic stress and anxiety symptoms, with dispositional optimism acting as a partial but limited protective factor [19]. Phenomenological data from the general population further describe adolescents and young adults who reported social anxiety, mental fatigue, and sleep disturbance following sustained exposure to graphic war news, emphasizing their particular susceptibility to media-mediated conflict^[16]

Two primary mechanisms appear to underlie the psychological effects of media-based cognitive warfare. The first is cognitive overload and emotional erosion, driven by continuous exposure to uncertain, threatening, or contradictory narratives. This mechanism has been described in studies from Ukraine and Arab countries, where media-induced uncertainty contributed to emotional exhaustion, depressive symptoms, and sleep disturbances^[16, 25]. The second mechanism is secondary trauma, wherein individuals develop trauma-like symptoms through indirect exposure to violent imagery or distressing narratives^[19, 24, 26].

Experimental and longitudinal studies on exposure to graphic images of mass violence show that repeated viewing can produce acute stress and PTSD-type reactions comparable to sometimes exceeding those reported by direct event witnesses, especially when images are immersive and viewed in quick succession [29, 30]. These results resonate with socio cognitive models of collective trauma, which underscore that repeated media exposure generates rumination, heightened risk perception, and long-term anxiety across the population [19]. These mechanisms reflect the capacity of media to shape emotional and cognitive responses in ways that parallel direct exposure to conflict. The findings of this review have important implications for public health and national security. As hybrid warfare increasingly incorporates psychological and informational components, understanding the mental health consequences of media-driven cognitive warfare becomes essential for strengthening societal resilience. Public media literacy programs, psychological preparedness training, and responsible media reporting practices may help mitigate the psychological burden associated with exposure to conflict-related content. Epidemiological studies of media exposure during recent conflicts indicate that individuals who limit time on war news and prefer balanced, less sensationalized sources show lower levels of stress and rumination, supporting the usefulness of “news-hygiene” and media-literacy interventions [30, 31]. Guidelines for media professionals and mental health services already recommend structured psychoeducation and coping-strategy training for frequent news consumers and at-risk occupational groups [32, 33]. Furthermore, mental health services should consider the unique needs of vulnerable groups, including adolescents, older adults, journalists, and frontline professionals.

Recent research on adolescents in Gaza exposed to continuous media coverage has documented high prevalences of anxiety, stress, and depressive symptoms linked directly with the frequency and emotional intensity of war-related viewing, underscoring the need for school-based and community-level support programs^[34]. Parallel evidence from studies of journalists repeatedly covering mass violence likewise calls for tailored psychological support and debriefing protocols in media organizations [35, 36].

Despite its contributions, this review has limitations. The number of eligible studies was relatively small, and methodological heterogeneity limited the ability to conduct quantitative synthesis. Additionally, most studies relied on cross-sectional designs, which restrict causal inference. Future research should employ longitudinal and experimental designs to better understand the long-term psychological effects of media-based cognitive warfare and to identify protective factors that enhance resilience. Longitudinal studies on mass-violence media exposure have already shown that

high-intensity, repeated viewing can sustain a “cycle of distress,” whereas social support, media-literacy education, and adaptive coping mitigated symptom persistence over time [37, 38]. Extending such frameworks to war-related, geopolitically sensitive media will be essential for designing evidence-based public health interventions against media-driven cognitive warfare.

Conclusion

This scoping review confirms that media-based cognitive warfare through violent imagery, misinformation, and uncertainty induces significant psychological harm including anxiety, depression, PTSD, and reduced perceived safety. Vulnerable groups such as adolescents, older adults, and journalists are disproportionately affected. These findings underscore media as a covert yet powerful tool of modern conflict with direct mental health consequences.

Recommendations:

Future research should employ longitudinal designs to establish causality and assess long-term psychological trajectories. Policymakers must integrate media literacy into national curricula and public health frameworks. Clinical guidelines should include media-related trauma screening and targeted psychological interventions for at-risk populations.

In Press