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BIOPSYCHOSOCIAL IMPACTS OF SOCIAL MEDIA – A SYSTEMATIC REVIEW OF ADVERSE DIMENSIONS

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Summary. This article aims to provide a comprehensive systematic review of the negative dimensions of social media use, with a specific focus on integrated biopsychosocial health. Existing research remains highly fragmented across disciplines, and a synthesis capable of connecting these impacts within a coherent framework is currently absent. A systematically guided integrative review of the literature was conducted in accordance with the methodological frameworks of Torraco (2016) and Whittemore and Knafelz (2005). The search was carried out across the Scopus, Web of Science, and PsycInfo databases for the period 2015–2026, employing a predefined combination of search terms. Inclusion criteria encompassed empirical and review studies published in English that explicitly addressed at least one adverse impact of social media. Thematic analysis of the included studies served to identify and categorise the principal domains of impact. The analysis identified five key, mutually interconnected domains of adverse impacts: (1) psychological and emotional effects, encompassing anxiety, depression, social comparison, and FOMO; (2) physical health consequences, particularly sedentary behaviour, sleep disturbances, and visual strain; (3) social and interpersonal risks, including cyberbullying, trolling, and the curtailment of offline contact; (4) informational and cognitive threats, such as the proliferation of disinformation and information overload; and (5) safety-related and socioeconomic impacts, comprising privacy violations, online fraud, and work-study conflict. The findings confirm that the adverse impacts of social media are complex, mutually contingent, and permeate all dimensions of human health. The biopsychosocial perspective reveals the reciprocal reinforcement among individual domains, whereby contextual factors – most notably the mode of use (active versus passive) and individual vulnerability – fundamentally modulate the resulting impact. The conclusions underscore the imperative for targeted interventions, the cultivation of digital literacy, and a systemic institutional response at the level of educational establishments.

Keywords: social media, adverse impacts, mental health, biopsychosocial model, cyberbullying, disinformation, digital well-being, digital literacy, educational institutions.

1. Introduction

Over the past decade, social media has emerged as one of the most significant sociocultural phenomena of contemporary society. Platforms such as Instagram, TikTok, Facebook, and X (formerly Twitter) are used by more than half of the global population, with the average user spending approximately two and a half hours per day on these platforms (DataReportal, 2024). Although social media undeniably offers benefits in terms of connectivity, information sharing, education, and community participation, a growing body of scientific literature systematically documents its more troubling dimensions.

Existing research is, however, markedly fragmented. Some studies concentrate exclusively on the psychopathological consequences of intensive use, particularly depression and anxiety (Alen et al., 2023; Precht et al., 2025), while others focus on the spread of disinformation and its epistemic repercussions (Bermes, 2021; Kumar et al., 2023). Still further research examines specific physical ailments such as musculoskeletal disorders or sleep disturbances (Hosen et al., 2021; Chen et al., 2022), or safety risks associated with online identity (Ryan & Taylor, 2024). This disciplinary fragmentation impedes comprehensive understanding of how individual domains of adverse impact mutually influence and reinforce one another. Šrobárová (2021), in an analysis of psychosocial determinants of adolescent behaviour within the Czech school environment, draws attention to the fact that this very fragmentation compels educators and guidance professionals to respond in practice to discrete manifestations of problematic digital behaviour without access to an integrative framework that would allow them to perceive these manifestations in their systemic interconnectedness.

What is absent is a synthesis capable of integrating these diverse adverse impacts into a coherent biopsychosocial framework, a model that conceptualises health as the outcome of the dynamic interaction

of biological, psychological, and social factors (Engel, 1977). As the conflicting findings in the literature further demonstrate (Leanza & Alani, 2020; Vélez-Grau, 2023), the impacts of social media are not monolithic: their intensity and character are substantially modulated by mode of use, demographic characteristics, and external context. Budayová (2020), drawing on an analysis of the social and emotional dimensions of pupils' functioning within the context of school climate, documents that the adverse effects of the digital environment manifest differently depending on the quality of the relational environment in which a pupil lives, and that the protective or risk factors of the school and family environment cannot be analytically separated from pupils' digital behaviour. It is precisely this interconnectedness that calls for a framework that transcends the boundaries of individual disciplines.

The objective of this review article is therefore to identify, categorise, and synthesise, by means of a systematically guided integrative review of the literature, the principal adverse dimensions of social media use as documented in recent scientific literature, to situate them within a biopsychosocial framework, and to formulate implications for research and for the practice of educational institutions. The research question may be articulated as follows: What are the principal categories of adverse impacts of social media on the biopsychosocial health of individuals, what factors modulate these impacts, and what are their implications for educational practice and policy?

2. Methodology

The review study was methodologically grounded in the framework of the integrative literature review as conceptualised by Torraco (2016) and Whitemore and Knafl (2005). The integrative review was deliberately selected as an approach permitting the synthesis of empirical and theoretical studies from diverse disciplines, with the aim being not mere narrative summarisation but the construction of a new conceptual synthesis that captures the mutual relationships among the identified domains of impact. It differs from the systematic review with meta-analysis in that it works with heterogeneous types of research and research designs rather than comparing quantitatively compatible outputs and is therefore particularly well suited to multidisciplinary topics that transcend the boundaries of a single field (Grant & Booth, 2009).

The search was conducted across the Scopus, Web of Science, and PsycInfo databases for the period 2015 to 2026. The search query was constructed in two blocks connected by the AND operator: the first block captured the type of environment using the terms social media or social network sites, while the second block captured relevant domains of impact using the terms negative impact, mental health, disinformation, cyberbullying, physical health, sedentary behavior, and well-being, with terms within each block connected by the OR operator. The search was restricted to publications in the English language and to documents classified as Article or Review.

Inclusion criteria encompassed empirical studies – both quantitative and qualitative – and review works that explicitly examined at least one adverse impact of social media on individual or societal health across physical, psychological, or social dimensions. As a further eligibility criterion, it was stipulated that studies must engage with a clearly defined population, a described research method, and verifiable findings. Studies focused exclusively on the marketing, commercial, or algorithmic aspects of platforms without reference to health-related or psychosocial consequences were excluded, as were works without sufficiently described methodology and studies relying exclusively on data more than ten years old without an updating framework.

Study selection proceeded in two phases. In the first phase, relevance and eligibility were assessed since titles and abstracts, according to predefined criteria. In the second phase, the full texts of eligible studies were evaluated, with reasons for exclusion explicitly recorded. For the synthesis of findings, reflexive thematic analysis as conceived by Braun and Clarke (2006) was employed; the procedure involved repeated reading of the included texts, coding of relevant passages, grouping of codes into preliminary themes, their revision and naming, and final organisation into analytical domains. The resulting domains were systematically interrogated against the biopsychosocial model to assess the primary component of the model to which each domain belongs and the mechanisms by which the domains mutually condition one another. During the synthesis, deliberate and particular attention was devoted to the identification

of moderating and mediating factors – that is, the conditions under which impacts are amplified, attenuated, or reversed – since these factors are most frequently overlooked in the review literature.

3. Findings – identification and Categorisation of Adverse Impacts

The review analysis identified extensive and multidisciplinary adverse impacts associated with social media use. In terms of their representation in the analysed literature, studies addressing psychological impacts – particularly depression, anxiety, and social comparison – predominate, constituting approximately one third of the included works, with a marked increase in their number observable after 2020 in connection with the post-pandemic context. Physical health impacts are represented primarily by studies focused on sleep and sedentary behaviour, though this domain is, in comparison with the psychological domain, methodologically more heterogeneous and encompasses a higher proportion of longitudinal designs. Social and informational impacts are most frequently examined in literature through cross-sectional correlational studies, while the safety-related and socioeconomic domain is characterised by a predominance of qualitative and mixed-methods approaches. A common methodological limitation is discernible across all domains: most studies capture a single point in time and operate at a correlational level, without the capacity to trace causal mechanisms or the developmental transformation of impacts over time. For the purposes of this review, the findings were thematically organised into five principal domains forming the foundation of the biopsychosocial synthesis: (1) psychological and emotional impacts, (2) physical health consequences, (3) social and interpersonal risks, (4) informational and cognitive threats, and (5) safety-related, privacy, and socioeconomic impacts.

3.1 Psychological and Emotional Impacts

The deterioration of mental health represents the dominant theme of the analysed literature. Numerous studies demonstrate statistically significant associations between intensive time spent on social media and elevated prevalence of depressive symptoms, anxiety, feelings of loneliness, and an overall reduction in life satisfaction (Alen et al., 2023; Thorisdottir et al., 2020; Precht et al., 2025). Šmahel et al. (2023), in a comparison of EU Kids Online IV and V data, document a statistically significant increase in symptoms of anxiety and depression among Czech and European adolescents in the post-pandemic period, with intensity of online exposure identified as one of the contributing factors.

Beyond clinically relevant symptomatology, literature reports a specific fatigue from social media, referred to as social media fatigue, consisting in the phenomenon of information overload that paradoxically leads to behavioural dependency on platforms (Bermes, 2021; Jin, Zhang & Luo, 2025). Platforms mediate mechanisms of social comparison – most notably so-called upward social comparisons, in which users are confronted with idealized depictions of others' lives – a process that can erode self-esteem and generate dissatisfaction with one's own life (Thorisdottir et al., 2020; Toyama et al., 2022). Closely related is the phenomenon of seeking external validation through likes and positive reactions, which renders users' self-worth contingent upon algorithmically mediated feedback (Domoff et al., 2025). A specific and well-documented phenomenon in the literature is the Fear of Missing Out (FOMO) – that is, the fear of being excluded from experiences – which motivates users towards persistent and compulsive platform monitoring at the expense of other activities (Bermes, 2021; Vélez-Grau, 2023). From an analytical perspective, it is crucial to note that the psychological domain is the most thoroughly researched of all five domains, yet simultaneously the most burdened by conflicting results: meta-analytic works report effect sizes ranging from negligible to moderate, with the mode of use – that is, whether it involves passive consumption or active communication – systematically moderating both the direction and the magnitude of the effect. Matějka (2025) in this context observes that, from the perspective of educational practice, the most serious psychological impact is not clinical depression but rather the subclinical fragmentation of attention and disruption of motivational regulation, which are less visible yet directly affect academic performance and the capacity for concentrated work among adolescents.

3.2 Physical Health Consequences

Adverse impacts are not confined to psychological functioning. Social media use is strongly associated with a sedentary lifestyle that displaces time devoted to physical activity (Marzo et al., 2024; Viner et al., 2019). Ganson et al. (2023), in a longitudinal study conducted on an international sample of adolescents,

demonstrated a direct correlation between time spent on social media and a higher prevalence of symptoms of eating disorders, identifying algorithmically reinforced exposure to idealised bodily standards as the key mediating mechanism. Prolonged sedentary behaviour contributes to the development of musculoskeletal disorders, most notably spinal pain (Chen et al., 2022), and constitutes a risk factor for weight gain.

Considerable attention has also been devoted to sensory burden. Extended screen viewing, frequently at inappropriate distances and in poor posture, is associated with visual fatigue, dry eye syndrome, and headache (Hosen et al., 2021; Chen et al., 2022). Simultaneously, the adverse influence on sleep cycles is well documented: the use of blue-light-emitting devices prior to sleep disrupts melatonin secretion, thereby compromising both the quality and duration of sleep, and sleep disruption in turn exacerbates emotional regulation and heightens vulnerability to the psychological impacts of social media (Sheldon, 2019; Lakhan, Sharma & Sharma, 2023). The biopsychosocial model thus, through feedback mechanisms, connects the physical health consequences with the psychological domain.

3.3 Social and Interpersonal Risks

Social media paradoxically contributes to social isolation. Excessive platform use repeatedly correlates in empirical research with the curtailment of face-to-face personal contact and with a decline in the quality of family relationships, a phenomenon that is particularly pronounced among adolescents and young adults (Thorisdottir et al., 2020; Leanza & Alani, 2020). Bedrošová et al. (2023), in a panel study covering 19 European countries, identified digital skills as a key mediator: higher digital competence statistically reduces the impact of cyberbullying and online risks on the overall well-being of adolescents.

Platforms simultaneously provide fertile ground for pathological forms of interaction. Cyberbullying, trolling, the dissemination of defamatory content, and hate speech are identified as pivotal adverse dimensions (Alen et al., 2023; Leanza & Alani, 2020; Rice et al., 2016). The anonymity or pseudo-anonymity of the online environment lowers social inhibitions and facilitates the rapid proliferation of hate speech and organised online firestorms. Talwar et al. (2019) draw attention to the fact that the motivations for participation in hateful interactions are substantially conditioned by platform architecture, which rewards emotionally intense content with heightened visibility. From an analytical standpoint, the social domain is distinctive in that it alone encompasses both direct impacts – such as cyberbullying as an interpersonal act – and structural impacts – such as the architectural facilitation of hateful content – and that distinguishing between these is of paramount importance for the selection of preventive strategies. Budayová (2020) in this context emphasises that cyberbullying and online conflicts are substantially conditioned by the climate of offline environments, particularly those of the school and family, and therefore cannot be addressed in isolation as purely digital phenomena without engagement with the adolescent's overall social context.

3.4 Informational and Cognitive Threats

The architecture of social media, optimised for the rapid dissemination of viral content, has proven to be a highly effective channel for the proliferation of disinformation and false information (Bermes, 2021; Kumar et al., 2023). The consequences of this phenomenon are political, economic, and public health-related: disinformation concerning vaccination, medical treatments, or climate change can exert tangible effects on both individual and collective decision-making. Bermes (2021) in this context describes the mechanism of social media fatigue as a psychological state in which cognitively overloaded users cease to critically evaluate shared content, thereby becoming unwitting amplifiers of disinformation.

Exposure to a constant stream of misleading or deliberately manipulative information leads to the erosion of trust in expert authorities, scientific institutions, and traditional media. This phenomenon is particularly grave in the context of public health and education, where it can engender the rejection of validated medical procedures or destabilise the capacity to critically assess information sources (Orr, Baram-Tsabari & Landsman, 2016). Information overload in turn contributes to the shortening of attentional span, to difficulties with deep reading, and to a preference for easily consumable, algorithmically recommended content – cognitive impacts that are especially pertinent in the context of formal education (Kumar et al., 2023).

3.5 Safety-Related, Privacy, and Socioeconomic Impacts

Privacy protection constitutes a distinct and significant domain of concern. Users perceive the continuous collection, analysis, and commercial exploitation of personal data as a violation of their privacy,

and the very awareness of this surveillance can contribute to psychological stress and to the so-called chilling effect – that is, to self-censorship and to behavioural modification as a consequence of the experience of permanent oversight (Al-Ansi et al., 2023; Küçük Öztürk & Özdil, 2022).

Platforms simultaneously facilitate various forms of criminal behaviour. Ryan and Taylor (2024), in a qualitative synthesis, document catfishing – the act of impersonating another person – as a sophisticated form of online fraud, identifying six typical emotional states experienced by victims: suspicion, love, depression, anger, shame, and a sense of having been foolish. The authors underscore that the motivations of perpetrators encompass financial gain, the pursuit of an idealised self, a desire for meaningful interaction, and simple entertainment, and that victims' vulnerability is systematically exploited irrespective of demographic characteristics. Among the most frequently affected groups, alongside older users, are adolescents, for whom the risk of catfishing is also associated with potential sexual manipulation.

By no means least, impacts on academic and occupational performance are identified. Excessive social media use generates conflict between professional or academic obligations and online activities (work-life conflict), reduces productivity through constant distraction and the fragmentation of attention (Xu, 2023; Talwar et al., 2019), and may adversely affect students' perception of their future employability, as those who internalise the performative norms of social media may treat them as a substitute for the development of genuine professional competencies (Marelić et al., 2021).

4. Discussion

The five domains identified across the analysed literature do not, upon closer examination, constitute discrete or self-contained categories of risk; they represent, rather, analytically separable dimensions of a single, systemically integrated phenomenon whose full complexity becomes legible only when viewed through a biopsychosocial lens. The discussion that follows pursues four interconnected objectives: first, to synthesise the identified domains into a coherent biopsychosocial framework that makes their mutual conditionality theoretically explicit; second, to account for the conflicting findings encountered in the literature by foregrounding the moderating and mediating factors that render the impacts of social media irreducibly contextual; third, to translate these analytical conclusions into evidence-informed implications for both future research design and the practical response of educational institutions; and fourth, to reflect critically on the methodological constraints of the present review, whose acknowledgement is a necessary condition of its intellectual integrity.

4.1 Biopsychosocial Synthesis: The Mutual Conditionality of Impacts

The presented findings confirm that the adverse impacts of social media do not constitute isolated incidents but form a complex and mutually interconnected system of risks, the full comprehension of which necessitates a biopsychosocial perspective (Engel, 1977). Individual domains interact and reinforce one another through concrete mechanisms. A sedentary lifestyle as a physical impact, associated with passive content consumption, leads to dissatisfaction with one's body amplified by social comparison psychological consequence. Information overload as a cognitive impact generates fatigue that reduces productivity as a socioeconomic consequence and simultaneously undermines the capacity for critical evaluation of disinformation as an informational impact. Cyberbullying as a social impact amplifies psychological symptoms of anxiety and depression and can produce physical manifestations of psychosomatic stress.

To understand these impacts as purely psychological, technological, or physical is therefore analytically insufficient and practically counterproductive. An intervention targeting exclusively one domain, without reflecting its systemic connections to the other domains, will necessarily remain incomplete. The biopsychosocial model thus provides not only a theoretical framework for understanding the impacts, but simultaneously implies the logic of multi-level, integrated intervention.

4.2 Conflicting Findings and the Contextual Nature of Impacts

A key finding of this review is that the impacts of social media are neither monolithic nor universally adverse. The analysed literature contains significant contradictions: while some studies report strong negative correlations with mental health (Alen et al., 2023), others report small or statistically negligible effects (Precht et al., 2025; Leanza & Alani, 2020). The recorded ambivalence suggests that moderating and mediating factors play a crucial role.

The first and arguably most important factor is the mode of use. An increasingly clear distinction is emerging between passive content consumption – which is systematically associated with adverse impacts such as social comparison and diminished well-being – and active engagement, encompassing communication with friends or creative participation, which can yield benefits in the form of social support and a sense of belonging (Goodyear et al., 2021; Onyeaka et al., 2023). The second factor is external context: during the COVID-19 pandemic, social media may paradoxically have functioned as a protective factor against social isolation, temporarily suppressing or counterbalancing its adverse dimensions (Vélez-Grau, 2023; Shanahan et al., 2023). The third factor is individual difference: adolescents with lower self-esteem, pre-existing psychological difficulties, or insufficient digital skills are demonstrably more vulnerable to adverse impacts (Bedrošová et al., 2023). A further layer of contextual vulnerability is linked to differences in learners' cognitive and educational needs, as pupils and students with specific learning difficulties may experience digitally mediated environments in a more ambivalent manner, benefiting from increased accessibility on the one hand while simultaneously facing heightened cognitive load, frustration, and exclusion when digital communication and instructional formats are not adapted to their needs (Matějka & Szpak, 2025).

This review distinguishes itself from numerous prior syntheses precisely in that it does not treat these moderating factors as a supplementary remark but positions them as analytically central. The impacts of social media are contextually conditioned, and their interpretation therefore always requires consideration of the circumstances under which they unfold. Within educational institutions, this contextuality becomes especially pronounced, because the effects of digital environments are filtered through school climate, teacher guidance, the quality of peer relationships, students' pre-existing vulnerabilities, and the level of digital and critical literacy that schools actively cultivate. In this regard, recent pedagogically oriented scholarship further suggests that the educational consequences of digital environments cannot be understood solely through the metric of exposure time, since the quality of pedagogical mediation, the transparency of technological use, and the preservation of the social-emotional dimension of learning substantially influence whether digital tools function as a source of support or as an amplifier of psychosocial burden (Oláh & Šimek, 2025). This review simultaneously and systematically connects individual psychological impacts with the context of educational institutions, a context that has hitherto remained underrepresented in review studies.

4.3 Implications for Research and Educational Practice

The findings of this review and the methodological contradictions identified in the literature carry direct implications for both future research and the practical operations of educational institutions. For future research, it is essential to transcend the predominance of correlational cross-sectional studies and to move towards longitudinal designs capable of tracing causal mechanisms over time. Currently absent are, for example, longitudinal studies systematically mapping the trajectory from FOMO to sedentary behaviour and subsequently to eating disorder symptoms in adolescents aged 12 to 15, or studies tracking how social media fatigue translates over time into academic motivation and scholastic attainment. A further research priority should be the examination of protective factors – such as the context of digital well-being (Vélez-Grau, 2023), the quality of offline social networks, and specific components of digital literacy – that demonstrably attenuate adverse impacts. Greater analytical attention should also be paid to heterogeneity within student populations, since the adverse consequences of digitally mediated environments are unlikely to be distributed evenly across learners and may be intensified in students with specific learning difficulties, reduced frustration tolerance, or lower capacity to regulate cognitively demanding online environments, which makes differentiated educational research designs particularly necessary (Matějka & Szpak, 2025).

For educational practice, the biopsychosocial nature of the problem calls for a multi-level, whole-school response that replaces the reactive approach with targeted educational and supportive strategies. At the level of pedagogical practice, the findings emphasise the need for proactive educators capable of recognising indicators of psychological distress associated with online interactions and of integrating discussions of cyberbullying, disinformation, and digital well-being directly into their teaching – not only within the framework of information technology or media literacy, but systematically across subject areas (Alen et al., 2023; Bermes, 2021). School psychologists and prevention coordinators must be

equipped to deliver interventions addressing addictive behaviour in online environments, anxiety arising from social comparison, and the sequelae of cyberbullying, with group programmes cultivating coping strategies and healthy self-esteem independent of online validation demonstrating established efficacy in this context (Jin, Zhang & Luo, 2025; Domoff et al., 2025). At the systemic level, it is imperative to embed digital literacy as a key competency within the curriculum –in a form that extends beyond mere technical skill to encompass critical thinking, media literacy, and the ethics of online conduct (Orr, Baram-Tsabari & Landsman, 2016; Helsper, Šmahel & Macháčková, 2024). Within this systemic framework, the pedagogically responsible use of emerging digital tools, including AI-supported learning environments, should be guided by principles of transparency, teacher supervision, critical reflection, and preservation of the social-emotional dimension of education, since the educational value of such technologies depends not only on their availability but on the quality of their pedagogical mediation and on the extent to which they strengthen rather than displace meaningful learning relationships (Oláh & Šimek, 2025). A whole-school response should therefore include not only preventive programmes and curricular innovation, but also explicit institutional standards for the safe, developmentally appropriate, and ethically accountable integration of digital technologies into teaching and student support.

4.4 Limitations of the Review

The limitations of this review article must also be acknowledged. The search was conducted in the English language, which may have led to the underrepresentation of research from non-anglophone countries, including the Central European context. There is a risk of publication bias, whereby studies reporting statistically significant – typically adverse – results are preferentially published. The review does not encompass grey literature and research reports, which may offer complementary findings. Finally, an integrative review by its very nature permits the synthesis of heterogeneous studies, yet at the cost of lower methodological rigour in comparison with meta-analyses that operate with quantitatively comparable outputs.

5. Conclusion

The conducted integrative literature review successfully identified and synthesised five principal domains of adverse impacts of social media on biopsychosocial health: psychological, physical, social, informational, and safety-related/economic. The analysis confirms that these impacts are mutually intertwined and constitute a complex system of risks, the understanding of which requires an integrative biopsychosocial perspective.

The key finding is the ambivalent and contextually contingent nature of the impacts: their intensity and character are fundamentally modulated by mode of use (active versus passive), individual user characteristics, and external context, with digital skills functioning as a demonstrated protective mediator. The reduction of the problem to a simple matter of time spent online is therefore analytically insufficient and practically counterproductive.

The practical contribution of this review lies in providing educational institutions with an integrated framework for understanding the adverse impacts of social media and in formulating multi-level recommendations for pedagogical practice, school guidance and counselling, and educational policy. Future research should focus on longitudinal designs capable of tracking causal mechanisms, on the investigation of protective factors, and on the development of specifically targeted intervention programmes that reflect the contextual conditionality of impacts.

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