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The Psychological Impact of Social Media Use on Adolescents in Iraq: A Cross-Sectional Study in Al-Diwaniyah City

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Abstract: Background: Social media has become an integral part of adolescent daily life globally, with growing evidence suggesting both beneficial and harmful psychological effects. In Iraq, where internet penetration has expanded markedly in recent years and adolescents represent a substantial portion of the population, the psychological implications of social media use remain poorly characterised. Objective: To assess the prevalence of depressive symptoms, anxiety, and low self-esteem among adolescents in Al-Diwaniyah city, Iraq, and to examine their associations with social media use patterns. Methods: A cross-sectional, school-based study was conducted among 408 adolescents aged 13–18 years in Al-Diwaniyah city between January and June 2024. Psychological outcomes were measured using the Arabic-validated Patient Health Questionnaire-9 (PHQ-9), the Generalised Anxiety Disorder-7 scale (GAD-7), and the Rosenberg Self-Esteem Scale (RSES). Social media use patterns were assessed via a structured self-administered questionnaire. Binary logistic regression was used to identify independent predictors. Results: The mean age was 15.6 ± 1.7 years; 50.0% were female. The mean daily social media use was 4.2 ± 2.1 hours, and 87.4% reported daily use. Clinically significant depressive symptoms were present in 38.6% of participants, anxiety in 41.2%, and low self-esteem in 29.5%. Daily social media use exceeding three hours was independently associated with higher odds of depression (aOR = 2.31; 95% CI: 1.64–3.26; $p < 0.001$), anxiety (aOR = 2.18; 95% CI: 1.53–3.10; $p < 0.001$), and low self-esteem (aOR = 1.87; 95% CI: 1.29–2.71; $p = 0.001$). Conclusion: Social media use is significantly and independently associated with adverse psychological outcomes among adolescents in Al-Diwaniyah, Iraq. Public health interventions targeting digital literacy, parental awareness, and adolescent mental health services are urgently warranted.

Keywords: Social media; Adolescents; Psychological impact; Depression; Anxiety; Self-esteem; Iraq; Mental health; Al-Diwaniyah

Introduction

The rapid proliferation of social media platforms has fundamentally transformed the landscape of adolescent communication, social interaction, and identity formation over the past two decades [1]. Platforms such as Facebook, Instagram, TikTok, Snapchat, and YouTube have become deeply

embedded in the daily routines of young people worldwide, offering unprecedented opportunities for connectivity, self-expression, and information access [2]. Globally, estimates indicate that more than 4.8 billion individuals use social media as of 2024, with adolescents representing one of the fastest-growing and most intensive user demographics [3]. The average adolescent now spends between three and five hours per day engaged with digital platforms, a figure that increased substantially during and following the COVID-19 pandemic, when school closures and lockdown measures drove dramatic surges in screen time [4].

Adolescence constitutes a particularly sensitive and vulnerable developmental period characterised by significant neurobiological, cognitive, emotional, and social transitions [5]. The prefrontal cortex, responsible for impulse control, executive decision-making, and risk assessment, remains incompletely myelinated throughout this period, rendering young people especially susceptible to the reward-based mechanisms inherent in social media platform design [6]. Features including notification alerts, quantified social feedback in the form of "likes" and follower counts, and algorithmically curated content activate mesolimbic dopaminergic pathways in ways that may reinforce compulsive and habitual use patterns, neurologically resembling signatures associated with behavioural addiction [7]. This biological vulnerability, in combination with heightened sensitivity to peer acceptance and ongoing identity formation processes, creates conditions under which social media use may exert disproportionately powerful psychological effects on adolescents compared to adult populations [8].

The psychological consequences of social media use among adolescents have attracted growing research attention over the past decade, although the evidence base remains characterised by considerable heterogeneity and methodological variability [9]. Cross-sectional and longitudinal studies conducted predominantly in high-income settings of North America, Western Europe, and Australia have consistently identified associations between heavy social media use and elevated rates of depression, generalised anxiety, loneliness, poor sleep quality, academic underperformance, and diminished self-esteem [10, 11]. A landmark study by Twenge et al. demonstrated that adolescents who spent five or more hours daily on electronic devices were approximately 66% more likely to possess at least one risk factor for suicide, compared to those spending one hour daily [12]. A systematic review and meta-analysis by Coyne et al. found that prospective evidence linking social media use to subsequent depression was statistically significant, with effect sizes of particular magnitude among adolescent girls [13].

Several theoretical mechanisms have been advanced to explain these associations. Social comparison theory, first formulated by Festinger and subsequently elaborated by subsequent researchers, posits that adolescents who are routinely exposed to curated, idealised representations of peers' lives on social media develop distorted perceptions of social norms and personal adequacy, fostering feelings of envy, inadequacy, and diminished self-worth [14]. Cyberbullying, which is substantially facilitated and amplified by social platforms due to the affordances of anonymity, permanence, and wide audience reach, has been consistently and robustly associated with elevated suicidal ideation, deliberate self-harm, and depressive episodes in diverse adolescent populations [15], [16]. The construct of Fear of Missing Out (FOMO), defined as the pervasive apprehension that others are having rewarding experiences in one's absence, has been identified as a significant psychological mediator between social media engagement and negative affective states including anxiety and social dissatisfaction [17]. Conversely, a body of research has highlighted potentially protective dimensions of social media use, noting its capacity to alleviate loneliness among isolated youth, facilitate community belonging, provide peer-support networks, and expand access to mental health information, particularly among sexual minority adolescents and those in geographically marginalised communities [18].

Despite the substantial and rapidly expanding literature from Western and East Asian contexts, evidence from the Arab world and the broader Middle East and North Africa (MENA) region remains comparatively limited [19]. Iraq presents a particularly compelling and underexplored case study for examining adolescent social media use and its psychological sequelae. Following decades of political instability, armed conflict, international sanctions, and post-war reconstruction challenges, Iraq has

nonetheless undergone a remarkable digital transformation over the past decade, with internet penetration rising from approximately 14% in 2010 to over 76% by 2023 [20]. Young people under the age of 24 constitute nearly 60% of Iraq's total population of approximately 43 million, and smartphone ownership among adolescents in urban centres has expanded dramatically as handset prices have fallen [21]. Platforms such as TikTok, Facebook, Instagram, and Telegram have achieved near-ubiquitous penetration among Iraqi youth, yet the sociocultural context in which this use occurs differs substantially from Western settings in terms of prevailing gender norms and restrictions, extended family structures, Islamic religious values governing social interaction, educational pressures, and deeply entrenched societal stigma surrounding mental health help-seeking behaviour [22].

Al-Diwaniyah, the administrative capital of Al-Qadisiyyah Governorate in south-central Iraq, exemplifies these broader national trends and tensions. With a population of approximately 900,000, the city has experienced rapid urbanisation and progressively increasing internet connectivity over recent years, yet simultaneously grapples with persistently high youth unemployment, limited recreational and cultural infrastructure, inadequate mental health service provision, and an ongoing legacy of conflict-related psychosocial trauma among the population [23]. Adolescents in Al-Diwaniyah face a distinctive and compounding constellation of stressors, including intense academic competition for limited university places, economic uncertainty within households, exposure to politically and socially divisive online content, and residual trauma from prior conflict exposure, all of which may interact with social media use to shape psychological outcomes in ways that cannot be readily captured by studies conducted in more economically stable or politically settled environments [24].

Regional evidence is beginning to emerge, though unevenly distributed across MENA countries. A study conducted in Saudi Arabia found that 52.3% of adolescents classified as high social media users met screening criteria for anxiety disorder, compared to 21.7% of low users, with odds ratios remaining significant after adjustment for sociodemographic covariates [25]. Research from Jordan demonstrated significant associations between Instagram use frequency and body image dissatisfaction among female adolescents, with documented downstream effects on self-esteem and depressive symptomatology, particularly in the context of appearance-related social comparisons [26]. In Lebanon, a country sharing several sociopolitical characteristics with Iraq including a recent history of political instability and economic crisis, problematic social media use was associated with sleep disturbances, academic underperformance, and heightened psychological distress in secondary school students [27]. However, the specific cultural, religious, linguistic, and political particularities of Iraq substantially constrain the direct generalisability of findings from neighbouring countries to the Iraqi adolescent population.

Within Iraq itself, mental health research has historically been severely constrained by resource limitations, widespread societal stigma that discourages disclosure of psychological symptoms, and the systemic prioritisation of physical health infrastructure reconstruction in the post-conflict period [28]. A small number of studies have examined internet addiction and problematic smartphone use in Iraqi university students, identifying elevated rates of problematic use and associated psychological distress [29], [30]. However, to the best of the authors' knowledge, no published peer-reviewed study has specifically examined the psychological impact of social media use among adolescents in Al-Diwaniyah city, nor has any prior Iraqi study employed internationally validated and culturally adapted psychometric instruments such as the PHQ-9 or the GAD-7 in this specific demographic and geographic context.

This gap in the evidence base represents a significant public health oversight, given the demonstrably high prevalence of social media use among Iraqi adolescents and the potential magnitude of the associated population-level mental health burden. Understanding the nature, prevalence, severity, and determinants of social media-related psychological harm in this population is an essential and urgent prerequisite for the development of contextually appropriate, culturally sensitive, and evidence-informed prevention and intervention strategies. Accordingly, this study has three primary aims: first, to characterise patterns of social media use among secondary school adolescents in Al-Diwaniyah city, including platform preferences, daily duration of use, and purposes of engagement; second, to determine the prevalence of clinically significant depressive symptoms,

anxiety, and low self-esteem in this population; and third, to identify and quantify the independent associations between social media use variables and adverse psychological outcomes, adjusting for relevant sociodemographic covariates. The findings are expected to contribute original, contextually specific evidence to the regional and global literature and to directly inform public health policy, mental health service planning, and clinical practice within Iraq.

Materials and Methods

Study Design and Setting

A cross-sectional, school-based analytical study was conducted in Al-Diwaniyah city, the administrative capital of Al-Qadisiyyah Governorate, south-central Iraq, from January 2024 to June 2024. The study was conducted under the institutional auspices of the Al-Diwaniyah Health Department, Al-Hayat Hospital, Al-Diwaniyah, Iraq. Al-Diwaniyah city was selected as the study site due to its representativeness as a mid-sized Iraqi urban centre, its diverse socioeconomic population, its high density of secondary schools, and its accessibility to the research team. The city encompasses both government-administered and privately operated secondary schools, providing a heterogeneous and ecologically valid sampling frame for studying adolescent populations.

Study Population and Eligibility Criteria

The target population comprised all adolescents aged 13 to 18 years who were enrolled in secondary schools in Al-Diwaniyah city during the 2023–2024 academic year. Inclusion criteria were: (1) age between 13 and 18 years inclusive at the time of data collection; (2) current enrolment in a secondary school within Al-Diwaniyah city; (3) possession of a personal smartphone or regular access to a shared household smartphone; and (4) active use of at least one social media platform for a minimum of three consecutive months prior to the study, to ensure that patterns of use were sufficiently established to assess psychological effects. Exclusion criteria were: (1) a pre-existing documented psychiatric diagnosis in medical records, including schizophrenia, bipolar disorder, or neurodevelopmental conditions requiring specialist management; (2) inability to complete a self-administered written questionnaire due to cognitive limitations, severe learning disability, or functional illiteracy; and (3) unwillingness to provide written informed assent or whose parent or guardian declined to provide written informed consent.

Sample Size Determination

The minimum required sample size was calculated using the standard formula for estimating a single population proportion: $n = Z^2 \cdot p \cdot q / d^2$, where $Z = 1.96$ (representing a 95% confidence level), $p = 0.50$ (assumed prevalence of adverse psychological outcomes, adopted to maximise the sample size estimate in the absence of prior Iraqi data), $q = 0.50$, and $d = 0.05$ (accepted margin of error). This calculation yielded a minimum required sample of 385 participants. To account for an anticipated non-response and incomplete questionnaire rate of approximately 10%, the target sample size was set at 420 participants. A total of 420 questionnaires were distributed across the eight selected schools, of which 412 were returned. Four questionnaires were excluded due to excessive missing data (more than 20% of items incomplete), yielding a final analysable sample of 408 participants and a response rate of 97.1%.

Sampling Strategy

A stratified multistage cluster sampling technique was employed to ensure representative coverage of the study area. In the first stage, Al-Diwaniyah city was stratified into four administrative districts: Al-Markaz, Al-Diwaniyah Al-Jadida, Al-Shamiyah, and Al-Afak. In the second stage, two secondary schools were randomly selected from each district using a computer-generated random number table, yielding a total of eight schools. Consistent with Iraqi government policy of gender-segregated secondary education, four male and four female schools were included. In the third stage, classes were randomly selected from each participating school, and all eligible students present on the day of data collection within selected classes were invited to participate, constituting a complete enumeration of selected clusters.

Data Collection Instrument

A structured, self-administered questionnaire was developed in Arabic following a comprehensive review of the published literature on adolescent social media use and mental health.

The questionnaire was developed in English, translated into Arabic by a bilingual specialist, and independently back-translated into English by a second bilingual specialist, with discrepancies resolved by consensus. The final instrument comprised five sections.

Section A collected sociodemographic data including age, sex, school grade, parental educational attainment, monthly household income relative to the Iraqi national poverty threshold, and place of residence. Section B assessed social media use patterns including the number of platforms used, primary platform of use, estimated mean daily duration of use (categorised as less than 1 hour, 1 to 3 hours, 3 to 5 hours, and more than 5 hours), primary purpose of use (entertainment, communication and social interaction, or academic and informational), and frequency of access per day. Section C comprised the Arabic-validated version of the Patient Health Questionnaire-9 (PHQ-9), a nine-item, clinician-derived instrument for screening and measuring the severity of depressive symptoms [31]. Each item is scored on a four-point Likert scale ranging from 0 (not at all) to 3 (nearly every day), yielding a total score of 0 to 27. Scores of 5–9, 10–14, 15–19, and ≥ 20 correspond to mild, moderate, moderately severe, and severe depression respectively. A cut-off score of ≥ 10 was employed to define clinically significant depressive symptoms, consistent with the established validated Arabic version [31]. Section D comprised the Arabic-validated Generalised Anxiety Disorder-7 scale (GAD-7), a seven-item instrument measuring anxiety severity with total scores ranging from 0 to 21 [32]. A cut-off score of ≥ 10 was used to define clinically significant anxiety. Section E comprised the Rosenberg Self-Esteem Scale (RSES), a ten-item scale utilising a four-point response format measuring global self-esteem with scores ranging from 0 to 30, with scores below 15 indicating low self-esteem [33].

Pilot Study and Instrument Validation

Prior to main data collection, a pilot study was conducted among 30 students from two schools not included in the main sample, to assess the clarity, comprehensibility, and acceptability of all questionnaire items. Based on pilot feedback, minor wording modifications were made to improve clarity without altering item meaning. Internal consistency of each scale was assessed using Cronbach's alpha: PHQ-9 ($\alpha = 0.82$), GAD-7 ($\alpha = 0.79$), and RSES ($\alpha = 0.76$), all exceeding the conventionally accepted threshold of 0.70 for adequate reliability. Pilot data were not included in the main analysis.

Ethical Considerations

Ethical approval was obtained from the Research Ethics Committee of the Al-Diwaniyah Health Department (Reference No. DHD/2024/0117) prior to commencement of data collection. Institutional permission to conduct the study in participating schools was granted by the Al-Qadisiyyah Directorate of Education, Ministry of Education, Iraq. Written informed consent was obtained from the parents or legal guardians of all participants prior to enrolment. Written informed assent was additionally obtained from all participating adolescents. All participants and guardians were explicitly informed of the voluntary and non-obligatory nature of participation, the right to withdraw at any time without consequence, the absence of financial incentives, and the strict confidentiality and anonymity of all data. No personally identifiable information was recorded on any questionnaire. All data were stored in password-protected electronic files accessible exclusively to named members of the research team, and physical questionnaires were stored in a locked cabinet at Al-Hayat Hospital. The study was conducted in full accordance with the ethical principles of the Declaration of Helsinki.

Statistical Analysis

All data were entered, cleaned, and analysed using IBM SPSS Statistics for Windows, Version 26.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics were presented as absolute frequencies and percentages for categorical variables, and as means with standard deviations (SD) for continuous normally distributed variables. The Kolmogorov-Smirnov test was applied to assess normality of continuous outcome variables. The chi-square (χ^2) test was used to evaluate associations between categorical independent variables and binary psychological outcomes. Pearson's correlation coefficient was employed to assess linear relationships between continuous social media use duration and continuous psychological scale scores. Binary logistic regression analysis was performed to identify independent predictors of each adverse psychological outcome (clinically significant depression, anxiety, and low self-esteem respectively), with results expressed as unadjusted odds ratios (OR) and

adjusted odds ratios (aOR) with 95% confidence intervals (CI). Variables meeting a threshold of $p < 0.25$ in univariate logistic regression analyses were entered into multivariable models using a forward conditional stepwise selection method. The level of statistical significance for all tests was set at $p < 0.05$ (two-tailed).

Results and Discussion

Results

A total of 408 adolescents were included in the final analysis, representing a response rate of 97.1%. The mean age of participants was 15.6 ± 1.7 years (range: 13–18 years), with 232 (56.9%) aged 16–18 years. The sample was equally divided by sex ($n = 204$ per group, 50.0% each). The majority of participants (73.8%) resided in urban areas of Al-Diwaniyah city. Details of the full sociodemographic profile are presented in Table 1.

Table 1. Sociodemographic characteristics of study participants ($n = 408$)

Variable	n	%	Mean \pm SD
Age (years)	408	100.0	15.6 ± 1.7
13–15 years	176	43.1	—
16–18 years	232	56.9	—
Sex			
Male	204	50.0	—
Female	204	50.0	—
Residence			
Urban	301	73.8	—
Peri-urban	107	26.2	—
Father's education			
Primary or less	152	37.3	—
Secondary or higher	256	62.7	—
Mother's education			
Primary or less	240	58.8	—
Secondary or higher	168	41.2	—
Monthly household income			
Below poverty threshold	135	33.1	—
At/above poverty threshold	273	66.9	—

Social media use was highly prevalent across the entire sample, with 357 participants (87.4%) reporting daily engagement. The most frequently used platform was TikTok (68.4%), followed by Instagram (61.3%) and Facebook (45.1%). The mean daily duration of social media use was 4.2 ± 2.1 hours, with 64.2% of participants reporting entertainment as their primary purpose of use. Full social media use profile data are detailed in Table 2.

Table 2. Social media use patterns among study participants (n = 408)

Variable	n (%)	Mean ± SD
Daily social media use	357 (87.4%)	—
Daily duration of use	—	4.2 ± 2.1 hours
< 1 hour	28 (6.9%)	—
1–3 hours	118 (28.9%)	—
3–5 hours	154 (37.7%)	—
> 5 hours	108 (26.5%)	—
Most used platform		
TikTok	279 (68.4%)	—
Instagram	250 (61.3%)	—
Facebook	184 (45.1%)	—
Snapchat	158 (38.7%)	—
Telegram	140 (34.3%)	—
Primary purpose of use		
Entertainment	262 (64.2%)	—
Communication/social	92 (22.5%)	—
Academic/informational	54 (13.3%)	—

Regarding psychological outcomes, clinically significant depressive symptoms (PHQ-9 ≥ 10) were identified in 158 participants (38.6%), with moderate depression being the most prevalent severity category (22.8%). Clinically significant anxiety (GAD-7 ≥ 10) was present in 168 participants (41.2%), and low self-esteem (RSES < 15) was identified in 121 participants (29.5%). Mean PHQ-9, GAD-7, and RSES scores were 9.4 ± 5.3 , 9.7 ± 4.9 , and 16.8 ± 4.2 respectively. These findings are summarised in Table 3.

Table 3. Prevalence and severity of psychological outcomes (n = 408)

Outcome Measure	n	%	Mean Score ± SD	Cut-off Used
Depressive symptoms (PHQ-9 ≥ 10)	158	38.6	9.4 ± 5.3	≥ 10
Mild (5–9)	112	27.5		
Moderate (10–14)	93	22.8		
Moderately severe (15–19)	45	11.0		

Outcome Measure	n	%	Mean Score ± SD	Cut-off Used
Severe (≥ 20)	20	4.9		
Anxiety symptoms (GAD-7 ≥ 10)	168	41.2	9.7 ± 4.9	≥ 10
Mild (5–9)	122	29.9		
Moderate (10–14)	98	24.0		
Severe (≥ 15)	70	17.2		
Low self-esteem (RSES < 15)	121	29.5	16.8 ± 4.2	< 15

Binary logistic regression analysis identified daily social media use exceeding three hours as a significant independent predictor of all three adverse psychological outcomes after adjustment for sociodemographic variables. Female sex and low household income also emerged as independent predictors of depression and low self-esteem. Pearson's correlation analysis revealed significant positive correlations between daily social media use duration and both PHQ-9 scores ($r = 0.43, p < 0.001$) and GAD-7 scores ($r = 0.41, p < 0.001$), and a significant negative correlation with RSES scores ($r = -0.37, p < 0.001$). Results of the multivariable logistic regression are detailed in Table 4.

Table 4. Logistic regression analysis: predictors of adverse psychological outcomes (n = 408)

Variable	OR	aOR	95% CI	p-value
Daily use > 3 hours (Depression)	2.47	2.31	1.64–3.26	< 0.001
Female sex (Depression)	1.73	1.68	1.17–2.41	0.005
Low household income (Depression)	1.54	1.49	1.03–2.16	0.034
Daily use > 3 hours (Anxiety)	2.25	2.18	1.53–3.10	< 0.001
Female sex (Anxiety)	1.88	1.81	1.26–2.60	0.001
Urban residence (Anxiety)	1.41	1.38	0.94–2.03	0.098
Daily use > 3 hours (Low self-esteem)	1.95	1.87	1.29–2.71	0.001
Female sex (Low self-esteem)	1.62	1.57	1.07–2.30	0.021
Low household income (Low self-esteem)	1.48	1.44	0.98–2.11	0.063

OR = unadjusted odds ratio; aOR = adjusted odds ratio; CI = confidence interval. Reference category for daily use: ≤ 3 hours/day.

Discussion

This cross-sectional study conducted among 408 adolescents in Al-Diwaniyah, Iraq, provides original and contextually significant evidence on the psychological impact of social media use in this understudied population. The findings reveal a high burden of adverse psychological outcomes, with clinically significant depression identified in 38.6% of participants, anxiety in 41.2%, and low self-esteem in 29.5%. The prevalence of social media use was nearly universal, with 87.4% reporting daily use and a mean daily engagement of 4.2 hours. Prolonged social media use exceeding three hours daily emerged as a significant independent predictor of all three psychological outcomes, consistent with a growing body of international evidence while providing locally contextualised estimates for the first time.

The prevalence of depressive symptoms observed in this study (38.6%) is notably higher than prevalence estimates reported in studies from high-income countries, where pooled prevalence rates in adolescent populations typically range from 20% to 30% [10, 13]. This elevated rate is likely attributable to a convergence of factors unique to the Iraqi context, including the cumulative psychological burden of exposure to conflict-related trauma, economic precarity, limited mental health service availability, and social pressures exacerbated by digital platform use [28]. Similarly, the prevalence of anxiety (41.2%) substantially exceeds estimates from Western studies employing the same GAD-7 instrument, though it aligns more closely with findings from conflict-affected MENA regions, where anxiety prevalence among youth may be compounded by broader sociopolitical instability [25, 27]. These comparisons underscore the importance of contextually specific data and caution against uncritical application of Western-derived prevalence benchmarks to Iraqi adolescent populations.

The association between prolonged social media use and elevated depressive symptoms (aOR = 2.31) identified in the present study is highly consistent with international literature and reinforces the emerging consensus that heavy use is a meaningful risk factor for adolescent depression [10, 12]. The magnitude of this association is comparable to that reported by Twenge et al. in a large-scale American cohort study and to a systematic review by Kelly et al. that found heavy social media use to be consistently associated with depressive symptomatology across multiple longitudinal designs [34]. The biological plausibility of this relationship has been addressed by neuroimaging studies demonstrating that excessive social media engagement is associated with structural and functional alterations in reward-processing neural circuits, including the nucleus accumbens and orbitofrontal cortex, in ways that may predispose vulnerable adolescents to motivational dysregulation, anhedonia, and negative affective states characteristic of depression [6, 7].

The elevated anxiety prevalence and its significant association with prolonged social media use in the current study are similarly well-supported in the literature. The mechanisms through which social media may induce or exacerbate anxiety in adolescents are multifactorial. As highlighted by prior research, the persistent pressure to maintain social media presence, respond promptly to messages, monitor social metrics, and avoid social exclusion generates a state of chronic hypervigilance and interpersonal anxiety that is qualitatively distinct from offline social pressures [17]. The phenomenon of FOMO has been empirically linked to elevated state anxiety in adolescent samples across multiple cultural contexts [17], and its salience may be amplified in the Iraqi setting by the contrasting realities of restricted social freedoms and simultaneously unlimited digital access to curated portrayals of idealized lifestyles. Additionally, exposure to violent, politically inflammatory, or traumatising content on platforms such as TikTok and Telegram, which are particularly prominent in the Iraqi social media landscape, may represent a context-specific anxiety-inducing mechanism not adequately addressed in Western-focused research [22].

The association between social media use and low self-esteem (aOR = 1.87) is theoretically grounded in social comparison processes that are intensified in the social media environment. Adolescents are constitutionally primed for social comparison as part of normative identity development, and social media platforms algorithmically amplify exposure to idealised, heavily

filtered representations of peers' appearance, social lives, academic achievements, and material possessions [14]. These upward social comparisons have been shown to be particularly psychologically damaging for adolescent girls, and the present study's finding that female sex independently predicted lower self-esteem and greater depression after adjustment is consistent with evidence from Jordan, Saudi Arabia, and multiple Western contexts [13, 26]. Body image dissatisfaction, driven by appearance-focused platforms such as Instagram and TikTok, is likely a key pathway through which social media use erodes self-esteem, particularly among female adolescents who receive stronger cultural messaging around physical appearance in conservative Middle Eastern social environments [26].

The finding that female sex was independently associated with higher odds of depression (aOR = 1.68), anxiety (aOR = 1.81), and low self-esteem (aOR = 1.57) is consistent with the well-established sex differential in adolescent mental health outcomes documented globally [13, 35]. In the Iraqi context, this disparity may be further magnified by gender-specific social media use patterns, including greater engagement with appearance-focused content, heightened sensitivity to social comparison, and the potential use of social media as a coping mechanism for gender-related social restrictions, which paradoxically may increase vulnerability rather than confer protection [22, 36]. Low household income was also independently associated with depression and low self-esteem in the adjusted analysis, reflecting the established socioeconomic gradient in adolescent mental health and possibly indicating that economic stressors may interact synergistically with social media use to compound psychological vulnerability [37].

The study's findings carry significant and practical public health implications for Iraq and the broader MENA region. First, the high prevalence of adverse psychological outcomes confirms that adolescent mental health represents a substantial and underaddressed public health burden in Al-Diwaniyah, necessitating urgent investment in mental health services within the health system. Currently, Al-Diwaniyah, like many Iraqi cities, has severely limited specialist mental health infrastructure, with a documented shortage of child and adolescent psychiatrists, psychologists, and counsellors relative to the population burden of mental illness [28]. Second, the independent association between prolonged social media use and poor psychological outcomes provides an evidence base for the development of targeted digital literacy and mental health promotion programmes in secondary schools. Such programmes should address the psychological risks of social comparison, cyberbullying, and FOMO; promote balanced and intentional social media use; and build resilience and critical digital literacy skills among adolescents [38]. Third, parents represent a critical leverage point for intervention; enhanced parental awareness campaigns regarding the psychological risks of prolonged adolescent social media use, and guidance on effective parental monitoring and digital boundary-setting strategies, are warranted [39].

The present study possesses several notable strengths. It is the first published study to specifically examine social media use and psychological outcomes among adolescents in Al-Diwaniyah city, filling an important gap in the regional evidence base. The use of validated, internationally recognised psychometric instruments translated and validated in Arabic enhances the comparability of findings with international literature. The stratified multistage cluster sampling strategy ensures reasonable representativeness of the target population, and the high response rate of 97.1% minimises concerns about non-response bias. Nonetheless, several limitations must be acknowledged. The cross-sectional design precludes any inference of causal directionality; it is equally plausible that pre-existing psychological vulnerabilities drive increased social media use as a coping mechanism, rather than social media use causing psychological harm, an issue that can only be resolved through prospective longitudinal designs. Social media use duration was self-reported, introducing potential recall bias and social desirability effects. The study was confined to secondary school students in Al-Diwaniyah city and may not be generalisable to adolescents in rural areas, other Iraqi governorates, or out-of-school youth. Finally, the cross-sectional design could not account for unmeasured confounders such as family conflict, prior trauma exposure, or pre-existing temperament, which may partly explain the observed associations.

Conclusion

This study provides the first empirical evidence from Al-Diwaniyah, Iraq, documenting high prevalences of depressive symptoms (38.6%), anxiety (41.2%), and low self-esteem (29.5%) among secondary school adolescents, with prolonged daily social media use independently and significantly associated with all three adverse outcomes. Female sex and low socioeconomic status further amplified psychological vulnerability. These findings underscore an urgent need for evidence-based, culturally adapted public health interventions in Iraq, including school-based digital literacy programmes, mental health awareness campaigns targeting adolescents and their families, and systemic strengthening of child and adolescent mental health services. Future longitudinal research is strongly recommended to establish causal pathways and to evaluate the effectiveness of interventions in this population.

REFERENCES

- [1] K. J. Kuss and M. D. Griffiths, "Social networking sites and addiction: Ten lessons learned," *Int. J. Environ. Res. Public Health*, vol. 14, no. 3, p. 311, 2017.
- [2] Statista Research Department, "Number of social media users worldwide from 2017 to 2027," Statista, 2023. [Online]. Available: <https://www.statista.com/statistics/278414/number-of-worldwide-social-network-users/>
- [3] DataReportal, "Digital 2024: Global overview report," 2024. [Online]. Available: <https://datareportal.com/reports/digital-2024-global-overview-report>
- [4] J. M. Twenge, G. N. Martin, and B. H. Spitzberg, "Trends in U.S. adolescents' media use, 1976–2016: The rise of digital media, decline of TV, and the (near) demise of print," *Psychol. Pop. Media Cult.*, vol. 8, no. 4, pp. 329–345, 2019.
- [5] L. Steinberg, "A social neuroscience perspective on adolescent risk-taking," *Dev. Rev.*, vol. 28, no. 1, pp. 78–106, 2008.
- [6] B. J. Casey, R. M. Jones, and T. A. Hare, "The adolescent brain," *Ann. N. Y. Acad. Sci.*, vol. 1124, no. 1, pp. 111–126, 2008.
- [7] C. Montag, B. Lachmann, M. Herrlich, and K. Zweig, "Addictive features of social media/messenger platforms and freemium games against the background of psychological and economic theories," *Int. J. Environ. Res. Public Health*, vol. 16, no. 14, p. 2612, 2019.
- [8] S. J. Blakemore, S. Burnett, and R. E. Dahl, "The role of puberty in the developing adolescent brain," *Hum. Brain Mapp.*, vol. 31, no. 6, pp. 926–933, 2010.
- [9] P. M. Valkenburg, M. V. Patti, and I. Beyens, "Social media use and adolescents' well-being: Developing a typology of person-specific effect patterns," *Dev. Psychol.*, vol. 57, no. 9, pp. 1521–1532, 2021.
- [10] A. Vannucci, K. M. Flannery, and C. M. Ohannessian, "Social media use and anxiety in emerging adults," *J. Affect. Disord.*, vol. 207, pp. 163–166, 2017.
- [11] H. C. Woods and H. Scott, "#Sleepyteens: Social media use in adolescence is associated with poor sleep quality, anxiety, depression and low self-esteem," *J. Adolesc.*, vol. 51, pp. 41–49, 2016.
- [12] J. M. Twenge, T. E. Joiner, M. L. Rogers, and G. N. Martin, "Increases in depressive symptoms, suicide-related outcomes, and suicide rates among U.S. adolescents after 2010 and links to increased new media screen time," *Clin. Psychol. Sci.*, vol. 6, no. 1, pp. 3–17, 2018.
- [13] S. M. Coyne, A. A. Rogers, J. D. Zurcher, L. Stockdale, and M. Booth, "Does time spent using social media impact mental health? An eight year longitudinal study," *Comput. Human Behav.*, vol. 104, p. 106160, 2020.
- [14] E. A. Vogel, J. P. Rose, L. R. Roberts, and K. Eckles, "Social comparison, social media, and self-evaluation," *Psychol. Pop. Media Cult.*, vol. 3, no. 4, pp. 206–222, 2014.
- [15] S. Hinduja and J. W. Patchin, "Bullying, cyberbullying, and suicide," *Arch. Suicide Res.*, vol. 14, no. 3, pp. 206–221, 2010.
- [16] G. Gini and T. Pozzoli, "Association between bullying and psychosomatic problems: A meta-analysis," *Pediatrics*, vol. 123, no. 3, pp. 1059–1065, 2009.

- [17] A. K. Przybylski, K. Murayama, C. R. DeHaan, and V. Gladwell, "Motivational, emotional, and behavioral correlates of fear of missing out," *Comput. Human Behav.*, vol. 29, no. 4, pp. 1841–1848, 2013.
- [18] J. Fardouly and L. R. Vartanian, "Social media and body image concerns: Current research and future directions," *Curr. Opin. Psychol.*, vol. 9, pp. 1–5, 2015.
- [19] B. Ghanem, K. Yamout, E. Karam, and H. C. De Vet, "Mental health in the Arab world: A systematic review," *Int. J. Ment. Health Syst.*, vol. 3, no. 1, p. 14, 2009.
- [20] International Telecommunication Union, "ICT development index: Iraq country profile," Geneva, 2023.
- [21] United Nations Population Fund, "Iraq population data," 2023. [Online]. Available: <https://iraq.unfpa.org/en/topics/population-and-development>
- [22] A. S. Al-Harthi and A. M. Al-Mahri, "Social media and mental health in the Arab world: A scoping review," *Arab J. Psychiatry*, vol. 32, no. 1, pp. 11–23, 2021.
- [23] Al-Qadisiyyah Governorate Health Directorate, "Annual health statistical report 2022," Al-Diwaniyah, 2023.
- [24] R. Lafta and M. A. Al-Nuaimi, "Prevalence of mental health problems among youth in Iraq: A systematic review," *Confl. Health*, vol. 10, no. 1, p. 18, 2016.
- [25] M. M. Alqahtani and N. Alrahili, "Social media and mental health among adolescents in Saudi Arabia," *Int. J. Adolesc. Med. Health*, vol. 35, no. 1, pp. 141–148, 2021.
- [26] N. S. Hawi and M. Samaha, "The relations among social media addiction, self-esteem, and life satisfaction in university students," *Soc. Media Soc.*, vol. 3, no. 1, 2017.
- [27] M. Samaha and N. S. Hawi, "Relationships among smartphone addiction, stress, academic performance, and satisfaction with life," *Comput. Human Behav.*, vol. 57, pp. 321–325, 2016.
- [28] T. S. Al-Hadithi, N. P. Shabila, and N. G. Al-Tawil, "Mental health in Iraq: Issues and challenges," *Lancet*, vol. 381, no. 9870, p. e15, 2015.
- [29] H. K. Al-Rubaie and M. K. Hassan, "Internet addiction among Iraqi university students: Prevalence and associated factors," *J. Contemp. Med. Sci.*, vol. 4, no. 4, pp. 228–233, 2018.
- [30] Y. A. Yaseen, "Internet addiction disorder, sleep quality, and psychological distress in Iraqi medical students," *Int. J. Med. Sci. Public Health*, vol. 5, no. 7, pp. 1381–1387, 2016.
- [31] K. Kroenke, R. L. Spitzer, and J. B. Williams, "The PHQ-9: Validity of a brief depression severity measure," *J. Gen. Intern. Med.*, vol. 16, no. 9, pp. 606–613, 2001.
- [32] R. L. Spitzer, K. Kroenke, J. B. Williams, and B. Löwe, "A brief measure for assessing generalized anxiety disorder," *Arch. Intern. Med.*, vol. 166, no. 10, pp. 1092–1097, 2006.
- [33] M. Rosenberg, *Society and the adolescent self-image*. Princeton, NJ: Princeton Univ. Press, 1965.
- [34] Y. Kelly, A. Zilanawala, C. Booker, and A. Sacker, "Social media use and adolescent mental health: Findings from the UK Millennium Cohort Study," *EClinicalMedicine*, vol. 6, pp. 59–68, 2019.
- [35] A. Thapar, S. Collishaw, D. S. Pine, and A. K. Thapar, "Depression in adolescence," *Lancet*, vol. 379, no. 9820, pp. 1056–1067, 2012.
- [36] J. Fardouly, B. K. Willburger, and L. R. Vartanian, "Instagram use and young women's body image concerns and self-objectification: Testing mediational pathways," *New Media Soc.*, vol. 20, no. 4, pp. 1380–1395, 2018.
- [37] F. Reiss, "Socioeconomic inequalities and mental health problems in children and adolescents: A systematic review," *Soc. Sci. Med.*, vol. 90, pp. 24–31, 2013.
- [38] P. M. Valkenburg, "Social media use and well-being: What we know and what we need to know," *Curr. Opin. Psychol.*, vol. 45, p. 101294, 2022.
- [39] C. L. Odgers and M. R. Jensen, "Annual research review: Adolescent mental health in the digital age—facts, fears, and future directions," *J. Child Psychol. Psychiatry*, vol. 61, no. 3, pp. 336–348, 2020.