MEHES JOURNAL (MEDICAL AND HEALTH SCIENCES JOURNAL) | ISSN:3023-5804
Arrival Date: 06/07/2026 | Published Date: 30/09/2026 | 2026 Vol: 4 Issue: 3 pp: 59-77 |
DOI: https://doi.org/10.5281/zenodo.22901323

ARTICLE TYPE: RESEARCH ARTICLE

Adölesanlarda Sosyal Medya Bağımlılığının Empati ve Sempati Düzeylerine Etkisinin Belirlenmesi
Determining the Effects of Social Media Addiction on Empathy and Sympathy Levels in Adolescents

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ÖZET

Amaç: Bu çalışma, ergenlerde sosyal medya bağımlılığı ile empatı ve sempatı düzeyleri arasındaki ilişkileri incelemeyi ve bu ilişkilerle bağlantili faktörleri araştırmayı amaçlamaktadır.

Yöntem: Bu kesitsel ve tanımlayıcı çalışma, 1 Nısan–15 Mayıs 2024 tarihleri arasında Türkiye'nin Akdeniz Bölgesi'nde yer alan bir il merkezinde yaşayan 14–18 yaş arası ergenlerle yürütülmüştür. Kartopu örnekleme yöntemi kullanılarak gönüllü onam formu, anket soruları ve ölçeklerden oluşan çevrimiçi bir veri toplama formu üzerinden hazırlanmıştır. Form, ergenlere ait sosyal medya grupları aracılığıyla paylaşılmış ve 633 gönüllü ergenden veri toplanmıştır. Verilerin analizinde parametrik testler kapsamında t-testi, tek yönlü varyans analizi (ANOVA) ve çok değişkenli hiyerarşik regresyon analizi kullanılmıştır.

Bulgular: Çalışmaya katılan 633 ergenin verileri incelendiğinde, yaş, cinsiyet, aile tipi ve aile geliri kontrol edildikten sonra gerçekleştirilen hiyerarşik regresyon analizinde, sosyal medya bağımlılığı ıle bağımsız olarak ılışkılı kalan tek değışkenın sempatı olduğu belırlenmıştır (β=0.887, $p<0.001$). Ayrıca, bilişsel empati düzeylerinin cinsiyete göre anlamli farklilik gösterdiği, aileye ilişkin özelliklerin ise sosyal medya bağımlılığı ve sempati düzeyleri ile ilişkili olduğu saptanmıştır.

Sonuç: Bulgular, aşırı sosyal medya kullanımının ergenlerin sosyo-duygusal gelişimiyle ilişkili olduğunu; sosyal medya kullanim düzeyi arttikça bilişsel ve duygusal empatı düzeylerının azaldığını, buna karşın sempati düzeylerinin arttığını göstermektedır. Ayrıca aile ilişkileri ve cinsiyetin de bu ilişkilerde önemli rol oynadığı görülmektedır. Bu nedenle, sağlıklı sosyal medya kullanımını ve empati gelişimini desteklemeye yönelik müdahalelerin hem birey hem de aile odaklı yaklaşımları içermesi önerilmektedir.

Anahtar Kelımeler: Ergen, Sosyal medya, Empati, Sempati, Hemşire

ABSTRACT

Objective: This study aims to investigate the associations between social media addiction and adolescents' empathy and sympathy levels and to explore the factors related to these associations.

Material and Method: This cross-sectional and descriptive study was conducted between April 1 and May 15, 2024, with a population consisting of adolescents aged 14-18 in a provincial center located. in Turkey's Mediterranean region. İt was developed using the snowball sampling method via an online data collection form consisting of a consent form, survey questions, and scales. This form was sent to adolescent social media groups, and their responses were requested. Parametric analyses, including t-tests, ANOVA, and multivariate regression analysis, were used to evaluate the data.

Results: Among the 633 adolescents included in the study, hierarchical regression analysis demonstrated that, after controlling for age, gender, family type, and family income, higher After adjustment for demographic variables, only sympathy remained independently associated with social media addiction (β=0.887, $p<0.001$). İn addition, it was found that levels of cognitive empathy differed significantly by gender, while family-related characteristics were associated with social media addiction and levels of empathy.

Conclusions: These findings suggest that excessive social media use is associated with adolescents' socio-emotional development, with higher levels of social media use being related to lower cognitive and emotional empathy and higher sympathy levels. Family relationships and gender also appear to play important roles in these associations. Therefore, interventions promoting healthy social media use and empathy development should incorporate both individual- and family-focused approaches.

Keywords: Adolescent, Social media, Empathy, Sympathy, Nurse

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Atıf /Cite: Avan H. Determining the Effects of Social Media Addiction on Empathy and Sympathy Levels in Adolescents. Mehes Journal. 2026Sep22;4(3):59–77. doi:10.5281/zenodo.22901323

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INTRODUCTION

The adolescent period is characterized by significant biological, psychological, and social changes, during which healthy lifestyle behaviors may be neglected and various addictive behaviors may emerge. One of the important behavioral addictions affecting adolescents aged 12–18 is social media addiction. Social media provides individuals with opportunities to share their thoughts, experiences, and creations while creating an interactive environment based on communication and discussion. Previous research has shown that individuals spend increasing amounts of time on social media platforms, using these virtual environments to fulfill social and psychological needs and construct new forms of interaction (1–3).

The increasing integration of social media into daily life has blurred the boundaries between virtual and real-world experiences. Particularly among adolescents, social media use has expanded rapidly and has become closely associated with social, cultural, economic, and interpersonal processes. Excessive engagement with these platforms may negatively influence adolescents' social relationships and communication patterns (4–6). Those who spend excessive time on social media often experience isolation and difficulty in communication (5). The transfer of communication, self-expression, and entertainment needs from offline environments to online platforms may contribute to social media addiction and may influence both social and antisocial behaviors (6). Since empathy plays an important role in promoting prosocial behaviors and preventing antisocial tendencies, understanding the factors associated with empathy during adolescence is essential (7).

Empathy is a key component of adolescents' social and emotional development and enables individuals to understand and respond appropriately to others' emotions (8,9). Cognitive empathy refers to the ability to understand another person's thoughts, beliefs, and perspectives (10). Emotional empathy refers to the capacity to share and respond to another person's emotional experiences.

The relationship between social media use, empathy, and sympathy can be explained through Social Cognitive Theory proposed by Bandura (1986) (11,12). According to this theory, individuals acquire social and emotional behaviors through observation, imitation, and interaction with others. Social media environments may provide adolescents with continuous opportunities for observational learning through digital interactions, emotional expressions, and peer feedback (13–15). However, while these environments may facilitate rapid emotional responses such as sympathy, excessive engagement may reduce opportunities for face-to-face

interactions and perspective-taking experiences that contribute to the development of cognitive and emotional empathy (11,16). Therefore, social media addiction may be associated with differences in empathy and sympathy levels during adolescence.

Previous studies have demonstrated that adolescents with higher empathy levels tend to display more prosocial and community-oriented behaviors, whereas lower empathy levels are associated with increased aggressive tendencies (9,17). As social media use continues to increase, understanding its relationship with adolescents' socio-emotional development has become increasingly important (15,18). Although previous studies have examined social media use and adolescent behaviors, few have simultaneously investigated cognitive empathy, emotional empathy, and sympathy within the same theoretical framework (11,15,18). Therefore, this study examined the relationships between social media addiction, cognitive empathy, emotional empathy, and sympathy among adolescents. From a nursing perspective, these findings may contribute to the development of preventive interventions and family-centered psychoeducational programs aimed at promoting healthy socio-emotional development (19–21).

Therefore, this study provides a more comprehensive evaluation of the relationship between social media addiction, empathy dimensions, and sympathy levels among adolescents. From a nursing perspective, understanding these relationships may contribute to the development of preventive interventions, psychoeducational programs, early identification of psychosocial risks, and family-centered counseling approaches for adolescents.

This study aimed to examine the relationship between social media addiction and adolescents' cognitive empathy, emotional empathy, and sympathy levels and to identify socio-demographic characteristics associated with these variables. Based on Social Cognitive Theory, social media addiction was conceptualized as the primary explanatory variable, whereas empathy and sympathy were treated as socio-emotional outcomes. Based on Social Cognitive Theory and previous empirical evidence, the following hypotheses were formulated:

- Higher levels of social media addiction are associated with cognitive empathy levels among adolescents.
- Higher levels of social media addiction are associated with emotional empathy levels among adolescents.
- Higher levels of social media addiction are associated with sympathy levels among adolescents.

- Selected socio-demographic characteristics are associated with social media addiction, empathy, and sympathy levels

MATERIALS AND METHODS

The study, conducted as a cross-sectional and descriptive research, includes adolescents aged 14-18 from a provincial center in Turkey's Mediterranean region. The sample consisted of adolescents in this age group who volunteered to participate and provided parental consent, responding to the survey questions.

After obtaining online consent from the adolescents and their parents, a volunteer form, survey questions, and scales were created by researchers using Google Forms between April 1 and May 15, 2024. These were sent to adolescent social media groups, and individuals were asked to fill out the forms on a voluntary basis. İn this study, 633 adolescents completed the survey forms using a snowball sampling method. This approach was preferred because it enabled rapid access to adolescents from different regions through peer networks and facilitated the recruitment of participants who could be reached efficiently via online platforms. A Post-Power analysis revealed an effect size of 0.2 (small), a margin of error of 5%, and a study power of 99% with a sample size of 633.

Data Collection Tools

The data collection tools included the Adolescent Demographic Form, the Social Media Addiction Scale, and the Empathy and Sympathy Scale for Adolescents.

The Adolescent Demographic Form consists of **eleven researcher-developed questions based on the relevant literatüre** (4,6,9,22). The form collected information on age, gender, perceived family income, family type, presence of problems with parents or siblings, self-perception as a sympathetic person, perception of being regarded as sympathetic by others, perceived ability to empathize in daily life, perceived ability to empathize with situations shared on social media, friends' empathy toward the participant, and the participant's ability to understand the emotions, thoughts, and behaviors of friends or family members.

The Social Media Addiction Scale, developed by Günüç (2009) and revised by Çömlekçi and Başol (2019), contains 7 items rated on a 5-point Likert scale. As the average score increases, the level of social media addiction rises (6). İn the original scale, Cronbach's Alpha was 0.850, while it was calculated as 0.842 in this study. The mean score of the total scale was used in all statistical analyses, with higher scores indicating higher levels of social media addiction.

***Empathy and Sympathy Scale for Adolescents*;** this is a 12-item scale using a 5-point Likert format, with scores for each item ranging from 1 to 5. İn this study, cognitive empathy, emotional empathy, and sympathy subscale mean scores were analyzed separately. No total score was calculated because the original scale recommends interpreting each subdimension independently. These subscale scores were included in the regression and group comparison analyses. İnstead of evaluating total scores, subdimensions are assessed. Subdimension scores of the scale are calculated by averaging the scores of the relevant items. An increase in scores from each subdimension indicates an improvement in emotional empathy, cognitive empathy, and sympathy skills. İn the original scale, Cronbach's Alpha values were 0.630, 0.633, and 0.753 (9), while in this study, they were calculated as 0.743, 0.835, and 0.883, respectively.

Data Evaluation

The data were analyzed using İBM SPSS Statistics version 22 in accordance with confidentiality principles. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were calculated. Data normality was evaluated using skewness and kurtosis values, which ranged within ±1.5, indicating that the assumption of normality was met. Homogeneity of variances was assessed using Levene's test. Parametric analyses, including independent samples t-tests, one-way analysis of variance (ANOVA), Pearson correlation analysis, and hierarchical multiple linear regression analyses, were performed. For all analyses, the mean total score of the Social Media Addiction Scale and the mean scores of the cognitive empathy, emotional empathy, and sympathy subscales of the Empathy and Sympathy Scale for Adolescents were treated as continuous variables.

Based on the theoretical assumptions of Social Cognitive Theory, social media addiction was considered the principal explanatory variable, as prolonged exposure to online interactions has been suggested to influence adolescents' empathy and sympathy through observational learning and social interaction. Therefore, hierarchical multiple regression analyses were conducted to examine the associations between social media addiction and empathy and sympathy while controlling for relevant socio-demographic characteristics. When significant differences were identified by ANOVA, Tukey's or Gabriel's post hoc tests were performed, as appropriate, to determine the source of the differences.

To assess the potential influence of common method bias, Harman's single-factor test was conducted by entering all 19 measurement items into an unrotated exploratory factor analysis using principal axis factoring. Three factors with eigenvalues greater than 1 were extracted,

and the first unrotated factor accounted for 30.55% of the total variance. As this value was below the recommended threshold of 50%, common method bias was not considered to pose a serious concern in the present study.

RESULTS

İn this section of the study, the findings regarding adolescents' gender, family income status, family type, experiences of conflict with family, empathy, sympathy, and social media addiction are evaluated.

Table 1. Distribution of socio-demographic characteristics of adolescents (n=633)

Variables (n:633)		**X̄±SD**	
Age (years)		16.29±1.00	
		n	**%**
Gender	Female	467	73.8
	Male	166	26,2
Family İncome Status	Our income is less than our expenses	156	24.6
	Our income is equal to our expenses	432	68.2
	Our income is more than our expenses	45	7.2
Family Type	Nuclear family	540	85.3
	Extended Family	65	10.3
	Single-parent family	28	4.4
İssues with Parents and Siblings	No	505	79,8
	Yes	128	20.2
Seeing Oneself as a Sympathetic Person	No	116	18.3
	Yes	517	81.7
Do Those Around You See You as a Sympathetic Person?	No	90	14.2
	Yes	543	85.8
Do You Empathize Enough?	No	71	11.2
	Yes	562	88.8
Do You Empathize Enough with Situations Shared on Social Media?	No	161	25.4
	Yes	472	74.6
Do Your Friends Empathize Enough to Understand You?	No	342	54.0
	Yes	291	46.0
Can You Understand the Reasons Behind Your Friends' or Family's Feelings, Thoughts, and Behaviors?	No	142	22.4
	Yes	491	77.6

A total of 633 adolescents participated in the study, including 467 females (73.8%) and 166 males (26.2%). İt was found that 68.2% of the adolescents had a family income equal to their expenses, 85.3% lived in nuclear families, and 20.2% experienced issues with their parents or siblings.

In the study, 81.7% of adolescents considered themselves sympathetic, while 85.8% felt that they were seen as sympathetic by those around them. Additionally, 88.8% stated that they could empathize in their daily lives, whereas 74.6% reported that they were able to empathize sufficiently with situations shared on social media. Moreover, 54% of adolescents felt that their friends did not empathize with them enough, but 77.6% reported being able to understand the

underlying reasons for the emotions, thoughts, and behaviors expressed by their friends or family (Table 1).

A hierarchical regression analysis was conducted to examine whether social media addiction predicted adolescents' sympathy levels after controlling for demographic characteristics (age, gender, family type, and income). İn the first step, demographic variables were entered into the model. Model 1 was statistically significant, F (4,628)=2.585, p=.036, and explained 1.6% of the variance in sympathy scores (R^2=.016; Adjusted R^2=.010). Among the demographic variables, only gender was found to be a significant predictor of sympathy levels (β=-.116, p=.004), indicating that sympathy scores differed according to gender.

İn the second step, social media addiction was added to the model. The overall model remained statistically significant, F(5,627)=494.509, p<.001, and the explained variance increased substantially (R^2=.798; Adjusted R^2=.796). The addition of social media addiction resulted in a significant increase in explained variance (ΔR^2=.782, p<.001).

İn the final model, social media addiction was found to be a significant positive predictor of sympathy levels (B=0.766, β=.887, t=49.217, p<.001, 95% Cİ [0.735, 0.796]). This finding indicates that higher levels of social media addiction were associated with higher sympathy scores among adolescents. Gender remained a significant predictor after the inclusion of social media addiction (β=-.051, p=.005); however, its effect size decreased. Age (β=-.003, p=.857), family type (β=-.032, p=.080), and income (β=-.018, p=.309) did not significantly contribute to the prediction of sympathy levels.

Collinearity diagnostics indicated no multicollinearity problems in the model, with variance inflation factor (VİF) values ranging from 1.003 to 1.030. Overall, the hierarchical regression analysis demonstrated that social media addiction was strongly and positively associated with adolescents' sympathy levels, substantially increasing the explanatory power of the model beyond demographic characteristics (Table 2).

The same hierarchical regression procedure was applied to cognitive empathy and emotional empathy. However, because the final models were not statistically significant, only the significant regression model for sympathy is presented.

Table 2. Hierarchical Regression Analysis Predicting Sympathy Levels from Social Media Addiction and Demographic Variables (n=633)

Predictor	B	SE	β	t	p	95% Cİ Lower	95% Cİ Upper
Model 1							
Constant	2.877	0.394	–	7.301	<.001	2.103	3.651

Predictor	B	SE	β	t	p	95% Cİ Lower	95% Cİ Upper
Age	-0.018	0.023	-0.031	-0.779	.436	-0.064	0.027
Gender	-0.154	0.053	-0.116	-2.889	.004	-0.259	-0.049
Family type	-0.029	0.047	-0.024	-0.606	.545	-0.122	0.064
İncome	-0.028	0.044	-0.025	-0.629	.530	-0.114	0.058
Model 2							
Constant	1.029	0.183	–	5.630	<.001	0.670	1.388
Age	-0.002	0.011	-0.003	-0.181	.857	-0.023	0.019
Gender	-0.068	0.024	-0.051	-2.796	.005	-0.116	-0.020
Family type	-0.038	0.021	-0.032	-1.753	.080	-0.080	0.005
İncome	-0.020	0.020	-0.018	-1.019	.309	-0.059	0.019
Social Media Addiction	0.766	0.016	0.887	49.217	<.001	0.735	0.796

Model Fit Statistics

Model	R	R^2	Adjusted R^2	ΔR^2	F Change	p
Model 1	.127	.016	.010	–	2.585	.036
Model 2	.893	.798	.796	.782	2422.340	<.001

Note. B = unstandardized regression coefficient; SE = standard error; β = standardized regression coefficient; Cİ = confidence interval; ΔR^2 = change in explained variance.

Assessment of Common Method Bias

Harman's single-factor test indicated that the first unrotated factor explained 30.55% of the total variance, which is below the commonly accepted threshold of 50%, suggesting that common method bias was unlikely to substantially affect the findings.

Table 3. Comparison of Social Media Addiction, Cognitive Empathy, Emotional Empathy, and Sympathy Scores According to Adolescents' Sociodemographic Characteristics (n=633)

Variables	Social Media Addiction $\bar{X}$±SD	Cognitive Empathy $\bar{X}$±SD	Emotional Empathy $\bar{X}$±SD	Sympathy $\bar{X}$±SD
Gender				
Female (n=467)	1.95±0.68	2.98±0.86	3.58±0.86	2.34±0.57
Male (n=166)	1.83±0.66	2.52±0.79	3.44±0.87	2.18±0.59
Test	t=1.918	**t=6.033**	t=1.796	**t=2.996**
	p=0.056	**p=0.000**	p=0.073	**p=0.003**
İssues with Parents and Siblings				
No (n=505)	1.82±0.598	2.83±0.867	3.56±0.874	2.24±0.516
Yes (n=128)	2.31±0.830	2.95±0.894	3.50±0.854	2.54±0.765
Test	**t=-7.659**	t=-1.359	t=0.690	**t=-5.259**
	p=0.000	p=0.175	p=0.490	**p=0.000**
Seeing Oneself as a Sympathetic Person				
No (n=116)	2.33±0.773	2.82±0.703	3.32±0.736	2.58±0.630
Yes (n=517)	1.83±0.622	2.87±0.907	3.60±0.890	2.23±0.558
Test	**t=7.527**	t=-0.509	**t=-3.144**	**t=5.929**
	p=0.000	p=0.611	**p=0.002**	**p=0.000**
Do Those Around You See You as a Sympathetic Person?				
No (n=90)	2.26±0.813	2.77±0.752	3.30±0.793	2.49±0.705
Yes (n=543)	1.86±0.639	2.87±0.891	3.59±0.876	2.27±0.559
Test	**t=5.187**	t=-0.988	**t=-2.976**	**t=3.380**
	p=0.000	p=0.324	**p=0.003**	**p=0.001**
Do You Empathize Enough?				

No (n=71)	2.20±0.841	2.67±0.865	3.40±0.708	2.47±0.697
Yes (n=562)	1.88±0.649	2.88±0.872	3.56±0.887	2.28±0.569
Test	**t=3.704**	t=-1.908	t=-1.506	**t=2.555**
	p=0.000	p=0.057	p=0.133	**p=0.011**
Do You Empathize Enough with Situations Shared on Social Media?				
No (n=161)	2.13±0.775	2.79±0.846	3.49±0.751	2.40±0.673
Yes (n=472)	1.85±0.630	2.88±0.882	3.57±0.907	2.27±0.551
Test	**t=4.562**	t=-1.127	t=-0.971	**t=2.428**
	p=0.000	p=0.260	p=0.332	**p=0.015**
Do Your Friends Empathize Enough to Understand You?				
No (n=342)	2.07±0.719	2.82±0.813	3.58±0.784	2.43±0.600
Yes (n=291)	1.74±0.586	2.90±0.938	3.51±0.961	2.14±0.530
Test	**t=6.122**	t=-1.170	t=1.048	**t=6.394**
	p=0.000	p=0.242	p=0.248	**p=0.000**
Can You Understand the Reasons Behind Your Friends' or Family's Feelings, Thoughts, and Behaviors?				
No (n=142)	2.22±0.784	3.00±0.695	3.43±0.837	2.54±0.677
Yes (n=491)	1.83±0.621	2.82±0.915	3.58±0.877	2.23±0.538
Test	**t=6.139**	**t=2.216**	t=-1.814	**t=5.812**
	p=0.000	**p=0.027**	p=0.070	**p=0.000**
Family Type				
Nuclear family (n=540)	1.90±0.683	2.81±0.863	3.54±0.856	2.29±0.593^{bc}
Extended Family (n=65)	2.22±0.666^{b}	2.94±0.859	3.59±0.940	2.49±0.537^{ac}
Single-parent family (n=28)	1.62±0.373	3.52±0.853^{c}	3.65±0.989	2.02±0.424^{ab}
Test	**f=9.579**	**f=9.240**	f=0.312	**f=6.721**
	p=0.000	**p=0.000**	p=0.732	**p=0.001**

$\overline{X}$: Average, SD: Standard Deviation, %: Percentage of total, f: One-Way ANOVA, t: İndependent Samples t-test. İntra-group comparisons are indicated by superscripts a, b, and c, where values with the same superscript are statistically similar. Values presented in bold indicate that the p-value is statistically significant.

An examination of the study data revealed that the gender variable was significantly associated with cognitive empathy and sympathy among adolescents ($p<0.05$), but was not significantly associated with social media addiction (SMA) or emotional empathy ($p>0.05$).

Adolescents' issues with their parents and siblings were significantly associated with SMA and sympathy levels ($p<0.01$). Adolescents' self-perceptions and the perceptions of those around them regarding being sympathetic individuals were significantly related to SMA, emotional empathy, and sympathy levels ($p<0.01$). The ability to empathize sufficiently in daily life and social media interactions was also significantly related to SMA and sympathy levels ($p<0.05$).

Additionally, friends' empathic responses toward adolescents were significantly related to SMA and sympathy levels ($p<0.01$). Understanding the reasons behind the emotions, thoughts, and behaviors displayed by friends or family was found to be significantly related to SMA, cognitive empathy, and sympathy levels ($p<0.05$). İt was observed that SMA, cognitive empathy, and sympathy levels differed significantly according to adolescents' family structure ($p<0.05$).

According to the Post Hoc Tukey analysis conducted to examine the source of these group differences, individuals from extended families showed higher levels of SMA and sympathy. Additionally, individuals from disrupted families were found to have significantly different levels of cognitive empathy.

DISCUSSION

This study examined the hypothesis that social media addiction is associated with adolescents' empathy and sympathy levels. Among the proposed hypotheses, only the hypothesis regarding the association between social media addiction and sympathy was supported after adjustment for socio-demographic variables, whereas the independent associations with cognitive and emotional empathy were not statistically significant. Therefore, the discussion primarily focuses on the mechanisms that may explain the observed association with sympathy. İn this context, the relationship between adolescents' problematic social media use and their empathy and sympathy levels, as well as the factors associated with these outcomes, was discussed in light of the existing literature. Additionally, implications for nursing practice were discussed to provide guidance for nurses working with adolescents in promoting healthy digital behaviors and psychosocial development.

The present study demonstrated that social media addiction was significantly associated with higher levels of sympathy and cognitive empathy, whereas no significant association was observed with emotional empathy. The association with cognitive empathy may reflect adolescents' greater exposure to diverse perspectives and social interactions through digital platforms, which may be related to perspective-taking. İn contrast, the lack of a significant association with emotional empathy may indicate that online interactions provide fewer opportunities for emotional sharing and affective responsiveness than face-to-face communication. These findings support the view that cognitive and emotional empathy represent distinct dimensions of empathic functioning and may be differentially associated with social media addiction (10,23,24).

Adolescents report that social media enables them to establish deeper connections and allows them to feel more confident and express themselves more freely compared with face-to-face interactions (25). This highlights the importance of examining how digital communication environments influence empathy development. Considering the differences between online and offline interactions, further research is needed to clarify how cognitive and emotional empathy may develop and function across different communication contexts.

A study conducted among university students reported that cognitive empathy predicted engagement behaviors such as liking and sharing content, demonstrating a significant relationship between cognitive empathy and social media interactions (26). This finding suggests that adolescents with higher cognitive empathy may engage with online content in a more conscious and socially oriented manner. However, the relationship between empathy dimensions and social media behaviors requires further investigation, particularly from a developmental and nursing perspective.

Contrary to the present findings, previous research has suggested that social media use frequency is positively associated with both cognitive and emotional empathy (27). One possible explanation for the non-significant association between social media addiction and empathy in the adjusted regression model is the multidimensional nature of empathy. Empathy encompasses cognitive, affective, and behavioral components, each of which may be influenced by a broad range of developmental and environmental factors beyond social media use. Family relationships, peer interactions, school climate, and individual personality characteristics have all been identified as important determinants of empathic development. Therefore, after controlling for sociodemographic characteristics, the unique contribution of social media addiction to empathy may have diminished. İn contrast, sympathy primarily reflects immediate emotional concern and affective responsiveness toward others, making it more susceptible to the emotional content and rapid interpersonal interactions frequently encountered on social media platforms. This distinction may explain why social media addiction remained a significant predictor of sympathy but not empathy in the present study. These inconsistent findings may be attributed to differences in study populations, measurement tools, cultural contexts, and patterns of social media use. İn the current study, social media addiction demonstrated a stronger association with sympathy, whereas its relationship with cognitive and emotional empathy appeared more complex. Although social media exposure may increase adolescents' awareness of others' experiences and encourage sympathetic reactions, it may not necessarily promote deeper emotional engagement or perspective-taking.

This finding may be explained by the nature of online communication environments, where adolescents are frequently exposed to emotionally stimulating content that may generate immediate responses such as concern, sadness, or compassion without requiring sustained emotional involvement (11). Unlike cognitive empathy, which requires understanding another person's thoughts and perspectives, sympathy may emerge more rapidly through emotional reactions to social media content. Consistent with this interpretation, previous research has

reported a positive relationship between social media use frequency and adolescents' sympathy (humanistic feelings) (27). Furthermore, sympathy has been reported to have a stronger association with social media violence and social behaviors compared with empathy (22). These findings may also be interpreted within the framework of Social Cognitive Theory. According to Bandura, repeated exposure to emotionally salient online interactions may reinforce observational learning and emotional responding through vicarious experiences (28–30). Adolescents may therefore exhibit stronger sympathetic reactions toward others' experiences encountered on social media, even when opportunities for perspective-taking and deeper cognitive processing remain limited.

The findings suggest that social media environments may provide adolescents with opportunities to observe others' experiences, interpret emotional expressions, and interact with diverse social content (31–33). However, these interactions may not always translate into deeper empathic processes, particularly emotional empathy. Therefore, adolescents with higher levels of social media addiction may display stronger sympathetic responses, while cognitive empathy may show a weaker association and emotional empathy may remain unchanged.

The relatively high proportion of explained variance observed in the present study should be interpreted with caution. İn psychological and behavioral research, models explaining such a substantial proportion of variance are relatively uncommon, particularly when based exclusively on self-report measures. Although preliminary analyses did not indicate serious threats to the validity of the findings, the possibility of common method bias cannot be entirely excluded, as all variables were measured using the same data collection method at a single time point. The use of self-report instruments may have inflated the observed associations because of shared method variance, a potential concern in studies relying on a single measurement approach (34). İn addition, sympathy and social media addiction may partially overlap in terms of emotional responsiveness to online interactions, which could have contributed to the high explanatory power of the regression model. Future studies should therefore employ multi-method assessment approaches, such as combining self-report data with behavioral observations, peer or parent reports, or longitudinal designs, to further examine the robustness of these associations. Despite these methodological considerations, the findings provide valuable insights into the relationship between social media addiction and sympathy among adolescents and should be interpreted within the context of the study design.

Beyond the statistical associations observed in the regression model, the nature of social media engagement may also provide important insights into adolescents' emotional responses. Social

media platforms allow adolescents to observe, share, and respond to others' emotional experiences, which may contribute to the development of sympathetic responses. Through access to diverse social networks and content, adolescents may encounter different perspectives and emotional experiences. However, nurses and nurse researchers should further investigate which types of social media engagement contribute to sympathy development and how these relationships change over time.

Gender differences were associated with variations in cognitive empathy and sympathy levels among adolescents. Female adolescents demonstrated higher levels of cognitive empathy and sympathy compared with males. One study examining empathy and sympathy through two mediation models reported significant gender differences and concluded that female adolescents were more empathetic than male adolescents (35). Another research indicated that gender significantly affects sympathy levels, with women exhibiting higher levels of sympathy than men (36). However, some studies report that gender does not influence sympathy levels (35). These findings indicate that the relationship between gender, empathy, and sympathy may vary depending on cultural, social, and individual factors (37).

The association between family-related difficulties, social media addiction, and sympathy levels suggests that adolescents' online behaviors may be influenced by the quality of their offline relationships. Parent–child interactions have been reported to reduce the negative effects of social media exposure on smoking and alcohol use among disadvantaged girls (38). Similarly, a direct relationship between parent–child relationship quality and empathy has been identified in both genders (39). These findings emphasize the importance of supportive family environments in adolescents' emotional and social development. Nurses working with adolescents should consider family dynamics and communication patterns when developing interventions related to social media use and psychosocial development.

Adolescents' perceptions of themselves and others' perceptions of them as sympathetic individuals were significantly related to social media addiction, emotional empathy, and sympathy levels. A study examining the relationship between empathy and personality traits during adolescence, a critical period for developing meaningful social relationships, contributes to understanding the nature of cognitive and emotional empathy (40). Since adolescence is a key period for social development, empathy-related characteristics may influence how adolescents interact within both online and offline environments. Nurses should consider adolescents' physical, psychological, and social development and establish trust-based relationships to support individualized care.

Adolescents' ability to empathize with experiences and content encountered in daily life and on social media was significantly related to social media addiction and sympathy levels. Previous research has shown that social media-based solidarity expressions may reflect emotions, empathy, respect, and moral concerns through different forms of communication (41). These findings suggest that social media functions not only as a platform for information exchange but also as a context where social sensitivity and emotional responses may develop.

Finally, family structure was significantly associated with social media addiction, cognitive empathy, and sympathy levels. The family represents an important social environment in which individuals acquire interpersonal skills and develop positive relationship patterns. Perceived loneliness originating from the family environment has been reported to explain 43% of the variability in empathy levels (42). Family structure has also been associated with changes in empathy development (43) and patterns of social media use (44). Therefore, family dynamics may play an important role in shaping adolescents' emotional development and digital behaviors. Nurses should consider family-related factors when supporting adolescents and promote healthy communication patterns that strengthen autonomy, social skills, and emotional development.

Building on the present findings, future research should employ longitudinal designs to clarify the temporal and potentially causal relationships between social media addiction, empathy, and sympathy throughout adolescence. The inclusion of objective indicators of digital media use, such as smartphone usage logs or application-based monitoring, may help reduce potential biases associated with self-reported measures. İn addition, ecological momentary assessment methods could provide a more nuanced understanding of adolescents' real-time emotional responses during social media use in their natural environments. Qualitative studies exploring adolescents' perceptions and experiences may further elucidate the mechanisms underlying these relationships, while intervention studies are needed to evaluate the effectiveness of nurse-led digital literacy, empathy enhancement, and healthy social media use programs in improving adolescents' psychosocial outcomes.

CONCLUSION

After adjustment for socio-demographic variables, social media addiction was independently associated only with sympathy levels, whereas no independent associations were observed with cognitive or emotional empathy. Cognitive empathy and sympathy levels differed significantly by gender among adolescents. Additionally, issues with parents and siblings have been found to be significantly related to SMA and sympathy levels. Being perceived as a sympathetic

person by those around them is significantly related to adolescents' SMA, emotional empathy, and sympathy levels. The ability to empathize adequately with shared experiences in daily life and on social media was significantly related to SMA and sympathy levels. İn conclusion, differences in family structure were associated with variations in SMA, cognitive empathy, and sympathy levels.

Contribution to nursing science and clinical practice

The findings of the present study have several implications for nursing practice. School nurses are well positioned to identify adolescents at risk of problematic social media use through routine screening and early assessment programs. Community health nurses can collaborate with schools and families to develop psychoeducational interventions that promote healthy social media habits and digital literacy while increasing awareness of the potential psychosocial consequences of excessive social media use. Psychiatric and mental health nurses can implement evidence-based interventions aimed at improving adolescents' emotional awareness, interpersonal communication, and adaptive coping skills, particularly among those exhibiting signs of social media addiction. Family-centered counseling interventions led by nurses may also strengthen parent–adolescent communication and encourage healthier patterns of technology use within the home environment. İn addition, nursing-led empathy training and social–emotional learning programs may help adolescents develop more effective interpersonal skills and emotional responsiveness, thereby supporting their psychosocial well-being in both online and offline settings.

Limitations

This study has several limitations that should be considered when interpreting the findings. First, the study was based on self-reported data collected from adolescents within a specific region and sample; therefore, the findings may not be fully generalizable to the broader adolescent population. Second, the cross-sectional design limits the ability to establish causal relationships, and the findings should be interpreted as associations rather than evidence of causation. Longitudinal studies are recommended to further explore the temporal relationships between social media addiction, empathy, and sympathy.

Third, the use of snowball sampling may have introduced selection bias, as adolescents who were more active on social media, had greater internet access, or were more willing to participate may have been more likely to be included. Consequently, adolescents with limited or no internet access may have been underrepresented, potentially affecting the representativeness of the sample. Although this sampling approach facilitated access to a relatively large adolescent sample, volunteer bias should be considered when interpreting the

results. Future studies using probability-based sampling methods are recommended to enhance representativeness and minimize potential sampling bias.

Fourth, although Harman's single-factor test suggested that common method bias was unlikely to substantially influence the findings, the use of self-report measures collected at a single time point may still have introduced some degree of common method variance. Finally, the use of multiple statistical comparisons may increase the possibility of Type İ error; therefore, the findings should be interpreted within the context of the overall study design and analytical approach. Furthermore, residual confounding resulting from unmeasured psychosocial variables (e.g., personality characteristics, depressive symptoms, or peer relationships) cannot be ruled out. Another limitation of this study is the use of snowball sampling, a non-probability sampling method. Although this approach facilitated the recruitment of a large sample of adolescents through online peer networks, it may have introduced selection bias and limited the representativeness of the sample. Therefore, the findings should be interpreted with caution and may not be fully generalizable to all adolescents.

Scientific Responsibility Statement

The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

Ethics Approval and Consent

Approval for the study was obtained from Kahramanmaraş Sütçü İmam University Medical Research Ethics Committee (decision dated 10.10.2023 and numbered 2023/16-04). Participating adolescents and their parents were informed about the purpose and process of the study via Google Forms, and their "informed consent" was obtained. Approval for the use of the scales was also obtained via e-mail. No personal data was collected through Google Forms.

Conflict of İnterest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Author Contributions

Design of Study: HA (100%)

Data Acquisition: HA (100%)

Data Analysis: HA (100%)

Writing Up: HA (100%)

Submission and Revision: HA (100%)

Financial Support/Funding

This article has not received external funding. This study was supported by the Scientific Research Projects Unit of Kahramanmaraş Sütçü İmam University under project number 2025/7-1 UKSP and was presented as an oral presentation at the 9th National, 5th İnternational Mediterranean, and 4th İnternational Pediatric Nursing Congress (November 5-8, 2025, Mersin).

Acknowledgements

We would like to thank the individuals who assisted in distributing the data collection forms to adolescents and their parents. We also thank the adolescents and parents who volunteered to participate in the study.

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