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ORIGINAL ARTICLE

Intolerance of Uncertainty in the Relationship between Self-regulation and Social Media Addiction

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Main Points

- Overuse of social media among young adults exacerbates addiction issues and is associated with mental health concerns.
- Individuals with high self-regulation skills have a lower risk of social media addiction because they are better able to cope with intolerance of uncertainty.
- Intolerance of uncertainty serves as a partial mediator of the association between self-regulation skills and social media addiction.
- Developing strategies to enhance resilience in the face of uncertainty is important for strengthening resistance to social media addiction.

Abstract

Excessive use of social media can result in anxiety, communication problems, and depression. Identifying the factors that contribute to these negative outcomes is essential for mitigating the detrimental effects of social media usage. This study aims to explore the mediating effect of intolerance of uncertaintyon the relationship between self-regulation skills and social media addiction. The sample comprised 365 university students, with 224 females (61.4%) and 141 males (38.6%), aged 18 to 28, with a mean age of 20.79. The measurement tools utilized included the Social Media Addiction Scale, the Intolerance of Uncertainty Scale, and the Self-Regulation Scale. Data analysis was conducted through structural equation modeling, incorporating bootstrapping techniques as well. Results demonstrated significant negative correlations between self-regulation and intolerance of uncertainty, as well as a notable positive correlation between intolerance of uncertainty and social media addiction. The structural equation modeling indicated that intolerance of uncertainty serves as a partial mediator in the relationship between self-regulation skills and social media addiction. Ultimately, the findings suggest that diminished self-regulation skills among young adult university students may reduce their tolerance for uncertainty, thereby increasing their propensity for social media addiction.
Keywords: Intolerance of uncertainty, self-regulation, social media addiction, structural equation modeling

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Introduction

The rise in social media platforms and their easy accessibility has significantly increased their usage among young adults (Primack et al., 2017). While this widespread engagement can yield both positive and negative outcomes, it also raises concerns about addictive behaviors that may contribute to various physical and psychological problems (Verduyn et al., 2017). Research indicates that problematic use of social media can lead to anxiety, communication issues, and depression. Consequently, it is crucial to explore the factors influencing social media addiction (SMA), as understanding these variables is essential for addressing potential addiction outcomes.

Self-regulation, whichenables individuals to control their behaviors through observation, evaluation, and inference, is becoming increasingly significant in this context. Its importance in identifying and addressing behavioral excesses or deficiencies has been well documented (Bandura et al., 2003). Thus, delving into how self-regulation affects SMA may provide valuable insights into mitigating this issue.

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Self-regulation is the capacity to manage thoughts, emotions, and actions toward achieving personal objectives, employing a cyclical approach of self-monitoring, self-evaluation, and self-reinforcement (Zimmerman, 2000). Self-monitoring enables the individual to notice his or her own behaviors, while self-evaluation involves comparing these behaviors with internal criteria. Self-reinforcement refers to the individual's use of intrinsic or extrinsic rewarding strategies to motivate himself or herself (Brown, 1999). Effective self-regulation is critical for coping with stress and challenges, underscoring the need for strategies to enhance these skills (Swanson et al., 2011).

This study posits that self-regulation might act as a buffering mechanism to mitigate the risk of SMA, potentially weakening the link between addiction and its negative effects. Individuals with high self-regulation abilities are likely to better manage their social media usage and mitigate addiction-related consequences (Zhang et al., 2024). Conversely, insufficient self-regulation can lead to SMA, goal conflicts, and detrimental impacts on subjective well-being (Reinecke et al., 2022). For example, low self-control among adolescents has been linked to increased susceptibility to internet addiction, including social media (Zhu, 2025), while higher self-regulatory self-efficacy has shown a negative association with addiction to social networking platforms (Favini et al., 2024).

Studies have shown that those at risk for internet addiction exhibit lower self-regulation levels, marking this as a crucial variable in SMA. Accordingly, this study proposes the hypothesis:

H1: Self-regulation negatively predicts SMA.

Intolerance of Uncertainty, Social Media Addiction, and Self-Regulation Skills

Intolerance of uncertainty (IU) refers to cognitive challenges in tolerating negative situations stemming from perceived ambiguity (Carleton, 2016). Studies indicate that individuals with heightened levels of IU tend to view ambiguous situations more negatively. This interpretation style may lead to increased anxiety levels and exacerbate addictive behaviors by turning to maladaptive coping strategies (Qiu et al., 2024). Sadeh and Bredemeier (2021) highlighted a correlation between high IU and impulsive behaviors, including aggression and substance use. Individuals experiencing high IU typically exhibit lower emotional resilience and often engage in short-term relief strategies that have negative long-term effects. Additionally, elevated levels of IU have been linked to maladaptive coping strategies, including the use of substances as a means to alleviate negative feelings (Rozgonjuk et al., 2019).

Carleton et al. (2016) established a connection suggesting that greater IU is linked to heightened mobile phone usage and internet usage, suggesting that digital tools serve as coping mechanisms for uncertainty, albeit at the cost of increased anxiety. Intolerance of uncertainty's multidimensional nature not only influences emotional processes but also behavioral patterns linked to technology use. Recent studies emphasize that IU is associated with both externalizing behaviors and internalizing avoidance strategies like digital addiction (Qiu et al., 2024). Especially, high IU individuals demonstrate heightened anxiety in uncertain situations, often resorting to excessive smartphone use for relief, which can evolve into maladaptive coping in the long term (Liu et al., 2022).

Recent research during uncertain conditions, such as the COVID-19 pandemic, indicates that IU reinforces connections to digital addiction through perceived stress and rumination, leading users to seek approval in social media environments (Sang et al., 2024). These findings suggest that IU significantly impacts the propensity for SMA (Henzel & Håkansson, 2021), particularly as individuals with high IU may gravitate to social media for comfort, increasing addiction risk (Morriss et al., 2023). Therefore, this study proposes a second hypothesis:

H2: Intolerance of uncertainty positively predicts SMA.

The level of an individual's tolerance for uncertainty shapes their reactions to unpredictable environments. In this context, an individual's growth need strength can affect both the capacity to tolerate emotional distress and the motivation triggered by this situation (van Hooff & van Hooft, 2017). According to the self-regulation theory, self-regulation enables an individual to control his/her thoughts and emotions in the face of a certain situation, to make evaluations and to exhibit goal-oriented behaviors in line with this evaluation. Research indicates that a person's experiences of boredom may be associated with their self-regulation abilities (Brown et al., 1999; Zimmerman, 2000).

The correlation between IU and self-regulation significantly influences emotional well-being and the presence of anxiety disorders. Research shows that individuals with high IU tend to exhibit lower self-regulation, which can intensify emotional challenges. When confronted with uncertain circumstances, those with high IU often experience increased stress and unease, negatively impacting their emotional health and psychological well-being (Morriss et al., 2023). Thus, this study proposes a third hypothesis:

H3: Self-regulation negatively predicts IU.

Therefore, the fourth hypothesis is:

H4: Intolerance of uncertainty has a mediating role between self-regulation and SMA.

The Present Study

The interplay between SMA, IU, and self-regulation skills is intricate and nuanced. High levels of SMA are believed to correlate with greater IU and diminished self-regulation, potentially impacting mental health negatively. To mitigate adverse effects of social media use among young adults, it is crucial to explore the factors. This study aims to investigate how IU may mediate the relationship between self-regulation and SMA, shedding light on these interconnected variables.

Material and Methods

Informed Consent

For this research, informed consent was secured from every participant involved in the study.

Ethical Approval

The study adhered to the ethical standards outlined in the 1964 Declaration of Helsinki and its later revisions, receiving approval from the Scientific Research and Ethics Review Board of Tekirdağ Namık Kemal University (Approval No.: T2024-2260; Date: 02.12.24).

Participants

The study comprised 365 young adult volunteers from a university, with 224 participants (61.4%) identifying as female and 141 (38.6%) as male. The participants' ages of ranged between 18 and 28 years, yielding a mean age of 20.79 years and a standard deviation of 2.63. In terms of academic levels, 208 participants (57%) were first-year students, 68 (18.6%) were in their second year, 50 (13.7%) were third-year, and 39 (10.7%) were fourth-year students. Participants were chosen through a convenience sampling approach.

Data Collection Tools

Social Media Addiction Scale

The Social Media Addiction Scale (SMAS), created by Tutgun-Ünal (2015), contains 41 items. Scores range from 41 to 205, with the subscales being assessable independently from one another. The scale, which has four sub-factors including busyness, mood regulation, repetition, and conflict, is 5-point Likert type. Addiction levels are categorized as "No Addiction," "Less Addicted," "Moderately Addicted," "Highly Addicted," and "Very Highly Addicted." This classification is based on dividing the score range from the SMAS and subscales into five equal segments (Tutgun-Ünal & Deniz, 2015). The internal consistency coefficient, Cronbach's alpha value, of the scale, which has no reverse scored items, was found to be in the range of 0.80 – 1.00, indicating that it is highly reliable. In this study, the sub-dimensions of preoccupation and mood regulation, whose dependency levels were found to be "moderately dependent," were used.

Intolerance of Uncertainty Scale

The scale initially created by Carleton, Norton, and Asmundson (2007) was translated and modified into Turkish by Sarıçam, Erguvan, Akın, and Akça (2014). The Turkish version retains the original 12-item structure and utilizes a 5-point Likert-type rating system. This adaptation features a two-factor structure that accounts for 78.57% of the total variance. The first factor is labeled "prospective anxiety" and comprises seven items, while the second factor represents "inhibitory anxiety" with five items. The reliability coefficients (Cronbach's α) for these factors are 0.84 for prospective anxiety and 0.77 for inhibitory anxiety, with an overall internal consistency coefficient of 0.88 for the scale data.

Self-Regulation Scale

The Turkish adaptation of the five-point Likert-type Self-Regulation Scale, originally developed by Brown et al. (1999), includes seven sub-dimensions and consists of 63 items. This adaptation was conducted by Aydın et al. (2013) with a sample of 591 university students. To validate the construct of the scale, exploratory factor analysis was performed, resulting in a refined three-factor structure encompassing self-reinforcement, self-evaluation, and self-monitoring, totaling 51 items. The internal consistency of the scale, as measured by Cronbach's alpha, was recorded at .87. Scores from the sub-dimensions reflect the participants' abilities in self-reinforcement, self-evaluation, and self-monitoring, while the overall score indicates general self-regulation skills. The scale permits a minimum score of 51 and a maximum score of 255, where elevated scores signify a high level of self-regulation capacity, and lower scores suggest diminished self-regulation abilities.

Data Analysis

In this study, which investigates the connections among self-regulation, IU, and SMA, correlation analysis, and descriptive statistics were initially conducted. Then, structural equation modeling (SEM) was conducted. With SEM, it was tested whether IU has a mediating role in the relationship between self-regulation and SMA. Two-stage SEM was used in the study. In the preliminary phase of the analysis, the measurement model, which examines the relationships between indicator and latent variables, was assessed. Following the measurement model, the hypothetical structural model was subjected to testing. To evaluate the fit of the models, several goodness-of-fit indices were utilized, including the chi-square to degrees of freedom ratio (χ^2/df), Comparative Fit Index (CFI), Normed Fit Index (NFI), Tucker – Lewis Index (TLI), and standardized root mean square residual (SRMR). The accepted critical thresholds were established as follows: $\chi^2/df < 5$, and CFI, NFI, and TLI > 0.90, with SRMR < 0.08 (Tabachnick & Fidell, 2001). Model comparisons were conducted using the chi-square difference test for both partial and full models. Additionally, Akaike Information Criterion (AIC) and Expected Cross-Validation Index (ECVI) values were analyzed to select the optimal model among several options. The model with the lowest AIC and ECVI values was deemed the best fit (Browne & Cudeck, 1993). Furthermore, to assess the mediating role of IU in the relationship between self-regulation and SMA, a bootstrapping approach within SEM was utilized. This process involved resampling 10,000 iterations to generate coefficients and confidence intervals (Preacher & Hayes, 2008). If the confidence intervals did not include zero, the findings were considered statistically significant.

Results

Preliminary Analyses

Firstly, it was analyzed whether the variables were normally distributed. The skewness values ranged from .043 to .309, while kurtosis values varied between −.254 and −.611. Since these results fell within the normality criteria for skewness (±2) and kurtosis (±7), it was concluded that the variables were normally distributed (Finney & DiStefano, 2013). Table 1 presents the descriptive statistics for the sub-dimensions of self-regulation, IU, and SMA, along with the correlation analysis results for these study variables.

As shown in Table 1, self-regulation and IU r(365) = −.27, 95% C.A. [−.24, −.04], SMA/occupation r(365) = −.28, 95% C.A. [−.31, −.12] and mood regulation r(365) = −.38, 95% C.A. [−.42, −.23] show significant negative relationships. On the other hand, significant positive relationships were found between intolerance of ambiguity and SMA/engagement r(365) = .25, 95% S.A. [.15, .35] and SMA/mood regulation r(365) = .32, 95% S.A. [.23, .41]. In addition, busyness and mood regulation dimensions of SMA also

Table 1.
Descriptive Statistics and Reliabilities for the Study Variables

	Descriptive Statistics and Reliabilities				Correlations		
Variables	**Mean**	**SD**	**Skewness**	**Kurtosis**	**1**	**2**	**3**
1. Self-regulation	181.73	18.11	.309	−.358	–		
2. IU	39.51	8.06	.099	−.254	−.27**	–	
3. SMA occupation	34.04	9.21	.043	−.611	−.28**	.25**	–
4. SMA mood modification	12.94	4.87	.285	−.567	−.38**	.32**	.62**

Note: IU = Intolerance of uncertainty; SD = Standard deviation; SMA = Social media addiction.
**$p < .01$.

showed a positive and strong relationship with each other, r(365) = .62, 95% S.A. [.56, .68].

Structural Equation Modeling

Measurement Model

The measurement model comprises three latent variables: self-regulation, IU, and SMA, along with seven observed variables that define these constructs. The analysis revealed acceptable goodness-of-fit indices for the measurement model, specifically χ^2 (11, N = 365) = 51.69, $p < .001$; CFI = 0.94; NFI = 0.92; IFI = 0.94; GFI = 0.96; and SRMR = 0.060. Factor loadings ranged from 0.32 to −0.28, with all loadings found to be significant. Given these results, it can be concluded that the measurement model is validated, indicating that the observed variables effectively represent the corresponding latent variables.

Structural Model

In the structural model, the first analysis tested the hypothesis that IU fully mediates the relationship between self-regulation and SMA among university students. In this fully mediated model, no direct pathway was established between self-regulation and SMA; instead, self-regulation's influence was channeled through IU. The goodness-of-fit indices for this model indicated acceptable levels, with results as follows: χ^2 (18, N = 365) = 94.42, $p < .001$; CFI = 0.88; NFI = 0.86; TLI = 0.82; IFI = 0.88; GFI = 0.94; SRMR = 0.078; AIC = 130.42; and ECVI = 0.36. To identify the most suitable model, a subsequent analysis incorporated a model where IU served as a partial mediator, allowing for a direct relationship between self-regulation and SMA. The results indicated that the goodness-of-fit indices for the partial mediation model were also at acceptable levels, with the findings as follows: χ^2 (17, N = 365) = 61.58, $p < .001$; CFI = 0.93; NFI = 0.91; TLI = 0.89; IFI = 0.93; GFI = 0.96; SRMR = 0.060; AIC = 99.58; and ECVI = 0.27.

All path coefficients in both models were determined to be significant. The chi-square difference test indicated a preference for the model with partial mediation, as the direct path added between self-regulation and SMA significantly enhanced the model ($\Delta\chi^2$ = 32.837, df = 1, $p < .001$). Furthermore, the AIC and ECVI values for the partial mediation model were lower than those of the full mediation model. In light of these findings, the model where IU partially mediates the relationship between self-regulation and SMA among university students was deemed preferable. The path coefficients for this selected model are presented in Figure 1.

Bootstrapping

The bootstrapping technique was utilized on the preferred partial mediation model identified in the SEM analysis. This technique aimed to provide further evidence regarding the significance of both direct and indirect paths within the model. The findings from the bootstrapping process, along with the results related to the study's hypotheses, are detailed in Table 2.

Upon analyzing Table 2, it is evident that all direct path coefficients are significant following bootstrapping. Additionally, the indirect path coefficient is also significant (bootstrap coefficient

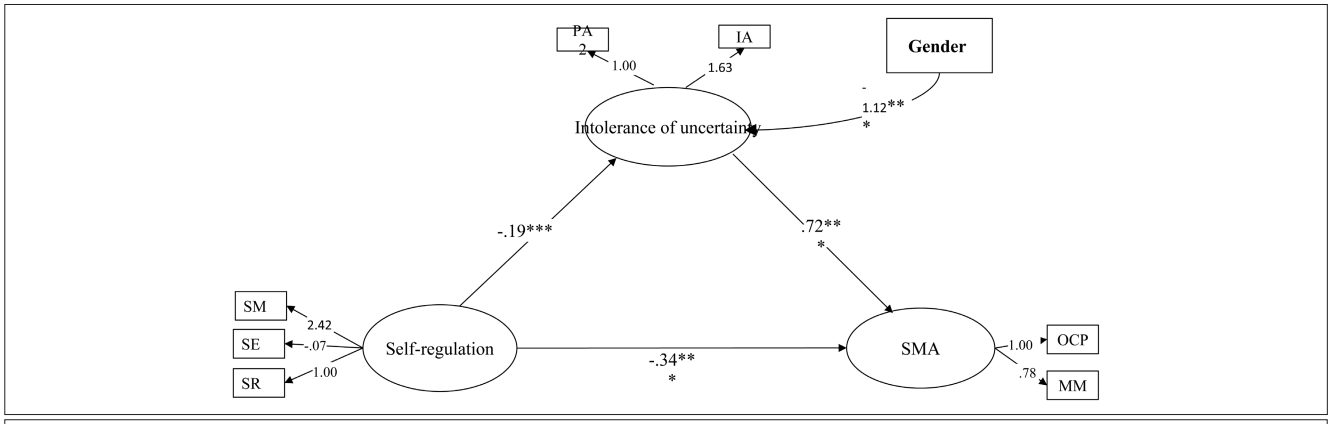

Figure 1. Standardized Parameter Estimates for the Partially Mediated Structural Model. Note: ***p < .001; IA = Inhibitory anxiety; MM = Mood modification; OCP = Occupation; PA = Prospective anxiety; SE = Self-evaluation; SM = Self-monitoring; SR = Self-reinforcement.

Table 2.
Parameters and 95% Confidence Interval for the Paths of the Final

Model pathways	Estimated	95 % CI	
		Lower	Upper
Direct effect			
Self-regulation → SMA	−.276	−.432	−.122
IU → SMA	.316	.172	.473
Self-regulation → IU	−.349	−.459	−.254
Indirect effect			
Self-regulation → IU → SMA	−.135	−.272	−.052

Note: IU = Intolerance of uncertainty; SMA = Social media addiction.

= −.13, 95% confidence interval = −.27, −.05). Thus, it can be concluded that IU partially mediates the relationship between self-regulation and SMA among university students.

Discussion

This study examined the mediating effect of IU on the association between self-regulation and SMA. Structural equation modeling analyses indicated that IU partially mediates this relationship. Specifically, lower self-regulation is associated with increased IU, which in turn raises the likelihood of SMA. Additionally, diminished self-regulation directly predicts an increased risk of SMA.

Intolerance of uncertainty's mediating effect on the link between self-regulation and SMA is crucial for understanding individuals' psychological states. Self-regulation allows individuals to effectively control their target behaviors while also aiding them in coping with negative effects (Eisenberg et al., 2004). Insufficient self-regulation may lead to increased social media utilization, thereby raising addiction risk. Empirical findings indicate that decreased self-regulation is closely linked to heightened smartphone addiction, as self-regulatory deficits significantly contribute to this issue (Jeong et al., 2016). High self-regulation levels are associated with fewer complications in social media use, whereas low self-regulation elevates addiction risk, causing conflicts in goal orientation and fostering addiction.

Moreover, higher levels of self-regulation can mitigate the adverse impacts related to social media by fostering more adaptive patterns of use and improving overall well-being (Reinecke et al., 2022). Insufficient self-regulation, on the other hand, leads to problematic engagement with mobile social networking apps, resulting in cognitive concentration difficulties and an increased sense of necessity that can intensify addiction (Liu et al., 2022). These findings support previous studies, showing that people with good self-control can better manage their social media use and reduce negative effects.

Additionally, IU is linked to various mental health issues and may foster maladaptive coping strategies under stress, potentially increasing the risk for SMA (Qiu et al., 2024). A notable connection between SMA and IU has been identified (Rozgonjuk et al., 2019), indicating that individuals with high intolerance may resort to suppression strategies, adversely affecting their self-regulation. This may lead to difficulties in emotion regulation.

Developing self-regulation emerges as a crucial approach to reduce the adverse impacts of IU. Studies show that IU correlates with rumination and suppression, exacerbating anxiety and encouraging addictive behaviors (Sahib et al., 2024). Moreover, individuals exhibiting high IU risk losing self-regulation capabilities, especially in stressful contexts (Trofimov & Zabolotna, 2023).

The interplay between self-regulation and IU shapes individuals' responses to stress. According to self-regulation theory, individuals can effectively adapt their behaviors to achieve goals by managing their thoughts and emotions (Zimmerman, 2000; Brown et al., 1999). This skill enhances individuals' capacity to cope with internal situations and increases their adaptive capacity when facing external challenges. Uncertainty tolerance refers to the psychological resilience developed against unpredictable situations. During high-uncertainty conditions, such as a pandemic, strong self-regulation skills may reduce stress-induced distress and avoidance behaviors.

Research indicates that people exhibiting high self-regulation navigate monotony better in isolating environments, often channeling discomfort into creative endeavors (van Hooff & van Hooft, 2017). Additionally, factors like growth need strength can amplify the impact of self-regulation strategies on responses to uncertainty, fostering more functional behaviors in stressful contexts (Leventhal et al., 2020). Consequently, developing strategies to bolster resilience in the face of uncertainty is vital. Enhancing self-regulation could diminish the adverse effects of IU and strengthen resilience against SMA.

In conclusion, the association of self-regulation skills with IU provides crucial insights into addressing SMA. By improving self-regulation and building resilience against uncertainty, individuals may manage their social media interactions in a healthier manner.

Implications

The influence of IU on SMA highlights the need for focused interventions. Research suggests that social support can alleviate the negative effects of IU, with strong social networks providing a shield against addiction. Therefore, establishing psychological support and educational programs is vital for preventing SMA. Enhancing emotional resilience can be achieved by bolstering these support systems (Zhu, 2025).

Moreover, it is essential to explore the interactions between IU and emotional regulation, as previous studies have demonstrated that resilience and self-regulation may serve as buffering factors against the negative effects of IU. Cognitive reappraisal and mindfulness-based interventions have been found effective in reducing IU levels (Gullo et al., 2023). Cultural contexts also play a significant role; certain ethnic groups exhibit structured problem-solving approaches toward uncertainty (Banshchikova et al., 2022), suggesting that interventions should be tailored to cultural dynamics.

Additionally, cognitive reappraisal and mindfulness strategies have been shown to decrease IU by improving emotional regulation (Clayton et al., 2023). Therapies focused on emotional regulation can diminish IU levels in individuals with anxiety disorders, while enhanced self-regulation positively impacts anxiety (Sahib et al., 2024). However, inherent cognitive biases necessitate a multifaceted treatment approach. Furthermore, the addictive features of social media platforms can hinder self-regulation efforts (Zhu, 2025).

Despite the prevalence of addiction among individuals with high IU, psychological resilience and social support are critical in this relationship. Morriss et al. (2023) highlight that IU is linked to various emotional responses, making it a significant focus for improving emotional health. Grasping IU improves treatment strategies for emotional disorders and aids in creating personalized support plans, crucial for safeguarding individuals against SMA. Therefore, while improving emotional regulation is crucial, the individual's cultural background and social support system must also be accounted for.

Limitations and Directions/Suggestions for Future Research

This research has various limitations. Firstly, the sample consists exclusively of young adult university students, which limits the applicability of findings given the rising social media use among various age groups (Primack et al., 2017). Future research should explore SMA risks across a broader demographic to enhance generalizability and understanding of the issue.

Secondly, reliance on quantitative self-report measures could be augmented with qualitative methods. Future research could benefit from integrating diverse data collection methods and employing longitudinal or experimental designs to improve the investigation of causal connections among variables. Such methodological advancements would facilitate a more comprehensive analysis of the findings and yield more robust results. Overall, addressing these limitations is crucial for a thorough exploration of SMA, and future studies should aim to produce more comprehensive and valid datasets.

Data Availability Statement: The data that support the findings of this study are available on request from the corresponding author.

Ethics Committee Approval: Ethical committee approval was received from the Ethics Committee of Tekirdağ Namık Kemal University (Approval No.: T2024-2260; Date: 02.12.24).

Informed Consent: Written informed consent was obtained from the participants who agreed to take part in the study.

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