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From Alexithymia To Internet Addiction: Uncovering Emotional and Developmental Mechanisms

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Abstract
This study examined the mechanisms linking alexithymia to internet addiction, focusing on the mediating role of sense of coherence and the moderating role of positive childhood experiences (PCEs). A total of 706 adults (56.5% female; ages 18–65) participated in the study. Participants completed self-report measures assessing alexithymia, internet addiction, sense of coherence, and PCEs. Mediation, moderation, and conditional process analyses were conducted using Hayes' PROCESS macro (Models 4, 1, and 14). Alexithymia positively predicted internet addiction and negatively predicted sense of coherence. Sense of coherence accounted for a significant portion of the association between alexithymia and internet addiction. Positive childhood experiences moderated the association between sense of coherence and internet addiction; individuals with higher levels of PCEs reported lower internet addiction, even when coherence was low. Furthermore, PCEs moderated the indirect association between alexithymia and internet addiction through sense of coherence. The moderated mediation effect was significant at moderate and high levels of PCEs but not at low levels. The findings indicated that higher levels of alexithymia were associated with higher levels of internet addiction, particularly among individuals reporting lower sense of coherence. However, positive early-life experiences were associated with lower levels of internet addiction, suggesting a contextual protective pattern. These results emphasized the importance of enhancing emotional awareness, self-concept coherence, and early relational support in prevention and intervention efforts targeting internet addiction.

Keywords Internet addiction · Alexithymia · Sense of coherence · Positive childhood experiences · Moderated mediation

Introduction

The rapid proliferation of internet usage has transformed various aspects of daily life, from social interactions to academic and professional engagements. However, excessive and uncontrolled internet use has emerged as a significant concern, with internet addiction

Extended author information available on the last page of the article

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increasingly recognized as a public health issue. This behavioral addiction is associated with psychological distress, functional impairment, and detrimental effects on physical and social well-being, particularly among adolescents and young adults [1–3]. Research highlights that internet addiction is linked to various psychological factors such as emotional dysregulation, social isolation, and maladaptive personality traits [4, 5]. Among these psychological factors, alexithymia has emerged as a critical vulnerability factor for internet addiction, as individuals with difficulty identifying and describing emotions may turn to the internet as a maladaptive coping mechanism to escape negative emotions or interpersonal challenges [6–8]. This study aims to examine the underlying mechanisms linking alexithymia to internet addiction, focusing on the mediating role of sense of coherence and the moderating role of positive childhood experiences.

Alexithymia and Internet Addiction

Alexithymia is a personality trait characterized by difficulties in recognizing, processing, and expressing emotions [9]. Previous research has established a strong link between alexithymia and internet addiction, with individuals high in alexithymia more likely to engage in excessive internet use as a means of emotional avoidance [10]. Recent studies have further illuminated the mechanisms linking alexithymia to internet addiction. For instance, alexithymia has been found to directly predict internet addiction while also influencing it indirectly through mediating variables such as metacognitive beliefs and meaning in life [7, 11]. Additionally, physical activity has been identified as a moderating factor that can attenuate the relationship between alexithymia and internet addiction by improving emotional regulation and reducing reliance on maladaptive coping strategies [8]. Given that the internet offers a space for distraction and escapism, those struggling with emotional regulation may be particularly vulnerable to internet addiction [12].

Sense of Coherence as a Mediator

Sense of coherence, grounded in Antonovsky's [13] salutogenic model, refers to an individual's capacity to perceive life as structured, comprehensible, and manageable. This construct plays a critical role in coping with stress and maintaining psychological well-being. A weak sense of coherence has been associated with identity confusion and maladaptive coping strategies, such as excessive internet use for emotional regulation [14]. This is particularly relevant for individuals with alexithymia—a personality trait characterized by difficulty identifying and describing emotions—who often lack a coherent self-concept. Alexithymic individuals may turn to the internet as a maladaptive coping mechanism to escape emotional discomfort or compensate for their inability to process emotions effectively, thereby increasing their susceptibility to internet addiction [15, 16].

Recent studies provide evidence supporting the mediating role of sense of coherence in the relationship between alexithymia and internet addiction. For instance, individuals with a strong sense of coherence are better equipped to manage stress and maintain emotional stability, which can mitigate the negative effects of alexithymia [17]. Conversely, those with a weaker sense of coherence are more likely to experience emotional dysregulation and turn to maladaptive behaviors like excessive internet use [18]. Furthermore, the three core components of sense of coherence—comprehensibility, manageability, and meaningfulness—

are often deficient in alexithymic individuals. This deficiency increases their reliance on external sources like the internet for structure and emotional relief [13, 16].

The mediating role of sense of coherence is further supported by research showing that alexithymia indirectly predicts internet addiction through mechanisms such as metacognitive beliefs and emotional regulation strategies [16, 19]. For example, individuals with low comprehensibility may struggle to make sense of their emotions or life events, leading them to seek distraction or validation online. Similarly, a lack of meaningfulness can result in feelings of purposelessness, further driving internet overuse as a compensatory behavior [17].

The Moderating Role of Positive Childhood Experiences (PCEs)

While alexithymia and a compromised sense of individual integrity increase vulnerability to internet addiction, protective factors such as positive childhood experiences (PCEs) may mitigate these risks. PCEs, including supportive parental relationships, emotional warmth, and social connectedness, have been found to foster resilience and adaptive coping strategies [20]. Previous studies indicate that early-life positive experiences play a crucial role in shaping emotional intelligence and self-regulatory capacities, which in turn reduce susceptibility to behavioral addictions [21]. Given these findings, it is hypothesized that PCEs will moderate both the direct and indirect effects of alexithymia on internet addiction by strengthening an individual's sense of coherence and emotional regulation skills.

Drawing from recent research, PCEs are linked to several positive outcomes that buffer against internet addiction. For instance, Hanson et al. [22], in a study of 555 college students, found that higher positive childhood experiences (*PCEs*) indirectly predicted lower depressive and anxiety symptoms by fostering greater executive functioning, emotion regulation, and thriving, even when accounting for adverse childhood experiences. Students who reported higher levels of PCEs were found to exhibit greater emotional regulation abilities, which may in turn lead them to manage negative emotions without relying on internet-based coping mechanisms.

Additionally, PCEs are associated with increased levels of social support and self-esteem [23], reducing the likelihood that individuals will turn to the internet for validation or connection. The presence of supportive relationships during childhood fosters a sense of security and trust, which can serve as a protective factor against the isolating effects of alexithymia and a weak sense of coherence.

Therefore, the moderating role of PCEs highlights the importance of early life experiences in shaping an individual's vulnerability to internet addiction. Interventions aimed at promoting positive childhood experiences could be a valuable strategy for preventing and treating internet addiction, particularly among individuals with alexithymia and a compromised sense of coherence.

The Present Study

Building on previous research, the present study seeks to examine the interplay among alexithymia, sense of coherence, and internet addiction, while investigating the moderating role of positive childhood experiences. Specifically, we have hypothesized that (1) alexithymia will indirectly affect internet addiction through sense of coherence, (2) positive childhood

experiences will moderate the relationship between sense of coherence and internet addiction, and (3) positive childhood experiences will moderate the indirect effect of alexithymia on internet addiction through sense of coherence. By integrating theoretical perspectives on emotional regulation, self-concept, and developmental psychology, this study aims to provide a comprehensive understanding of how these factors contribute to internet addiction. These insights may inform targeted interventions aimed at enhancing emotional awareness and strengthening protective childhood experiences to mitigate the risks associated with internet addiction.

Method

Research Model

In this study, the network of relationships among variables was tested through mediation, moderation, and conditional process analyses. The mediating role of sense of coherence (M) in the relationship between alexithymia (X) and internet addiction (Y) was tested using a mediation model (Hayes Model 4; Hayes [24]),. Mediation analysis is a statistical procedure that examines whether the effect of an independent variable on a dependent variable is transmitted through a mediator variable [25]. The moderating role of positive childhood experiences (W) in the relationship between sense of coherence (M) and internet addiction (Y) was examined using a moderation model (Hayes Model 1; Hayes [24]),. Moderation analysis is conducted to determine under which conditions the relationship between two variables changes. Statistically, moderation is typically tested by examining the linear interaction between X and W in a model predicting Y. A moderator variable is also referred to as an interaction variable [26]. Finally, whether the indirect effect of alexithymia (X) on internet addiction (Y) through sense of coherence (M) varies depending on the level of positive childhood experiences (W) was tested using conditional process analysis (Hayes Model 14; Hayes [24]),. Conditional process analysis is a combination of mediation and moderation analyses, focusing on the estimation and interpretation of the conditional nature (moderation component) of the indirect and/or direct effects (mediation component) of X on Y in a causal system [26]. The proposed models are presented below (Fig. 1).

Research Group

A priori power analysis was conducted to determine the required sample size using G*Power 3.1.9.7. The analysis indicated that a minimum of 89 participants would be sufficient to detect a medium effect size ($f^2 = 0.15$) with $\alpha = 0.05$ and power = 0.95. The study sample comprised 706 individuals. Among them, 399 (56.5%) identified as female, and 307 (43.5%) as male. Participants' ages ranged from 18 to 65 years.

Regarding educational background, 62 participants (8.7%) had completed primary school, 147 (20.8%) had completed high school, 389 (55.1%) had obtained a university degree, and 108 (15.3%) held a postgraduate degree. In terms of marital status, 226 (32%) were married, 413 (58.5%) were single, and 67 (9.5%) were divorced or widowed. The average time participants reported spending online without a specific purpose was 7.26 h per day. The average number of actively used social media accounts was 1.12.

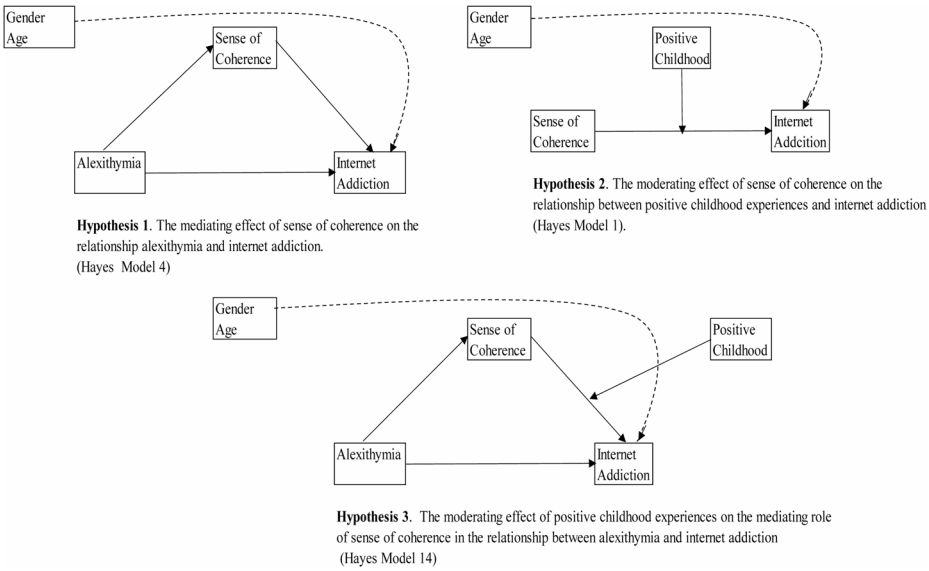

Fig. 1 Proposed models

To ensure that the sample represented the general population, individuals with any psychiatric diagnosis or those receiving psychiatric treatment were excluded. Participants from all levels of education and marital statuses were included, provided they were over the age of 18.

Data Collection Tools

Toronto Alexithymia Scale (TAS-20) Developed by Bagby et al. [27] and adapted into Turkish by Güleç et al. [28], the scale consists of 20 items across three sub-dimensions. Higher scores indicate higher levels of alexithymia. The Toronto Alexithymia Scale is a self-assessment tool, with responses rated on a five-point Likert scale (1 = Never; 5 = Always). A sample item illustrating the instrument's scope is: "I often don't know exactly what I feel.". Its validity was supported by exploratory factor analysis (explained variance = 31.0%) and confirmatory factor analysis (RMSEA = 0.079; AGFI = 0.84; GFI = 0.87; df = 167; χ^2 = 564.09). The Cronbach's alpha coefficient for the original scale is 0.78; in our study, the reliability coefficient was 0.77.

Internet Addiction Scale Developed by Taş and Bilgin [29], this 9-item unidimensional scale is rated on a 5-point Likert-type scale. Higher scores indicate higher levels of internet addiction. The internet addiction scale is a self-assessment tool, with responses rated on a five-point Likert scale (1 = Never; 5 = Always). A sample item illustrating the instrument's scope is: "Have you ever wanted to spend less time on the internet but were unable to do so?". Exploratory factor analysis indicated that the single-factor structure accounted for 39.607% of the total variance. Confirmatory factor analysis revealed acceptable model fit indices (χ^2/df = 2.38, RMR = 0.06, GFI = 0.94, AGFI = 0.90, CFI = 0.90, RMSEA = 0.08). The test–retest correlation coefficient

measured one month apart was r =.90. The Cronbach's alpha coefficient reported in the original study was 0.78, while the reliability coefficient in our study was 0.84.

Positive Childhood Experiences Scale Developed by Bethell et al. [20] and adapted into Turkish by Çiçek and Çeri [30], the scale consists of 7 items under a single factor. Higher scores indicate higher levels of positive childhood experiences. The positive childhood experiences scale is a self-assessment tool, with responses rated on a five-point Likert scale (1 = Never; 5 = Always). A sample item illustrating the instrument's scope is: "How often did you feel that your family was there for you in difficult times?" Exploratory factor analysis revealed that the scale explained 45.22% of the total variance. Confirmatory factor analysis yielded good fit indices (RMSEA = 0.076; χ^2/df = 2.25; IFI = 0.96; GFI = 0.97; CFI = 0.97; RMR = 0.76; NFI = 0.96). The original Cronbach's alpha coefficient was 0.78; in our study, the reliability coefficient was 0.75.

Sense of Coherence Scale Originally developed by Antonovsky [13] and adapted into Turkish by Scherler and Lajunen [31], The scale consists of 13-items. Higher scores indicate higher levels of sense of coherence. The sense of coherence scale is a self-assessment tool, with responses rated on a seven-point Likert scale (1 = Never/very rarely; 7 = Very often/always happened). A sample item illustrating the instrument's scope is: " Do you have the feeling that you are not interested in what is going on around you?." Exploratory factor analysis revealed that the three sub-dimensions explain 28% of the total variance. The original Cronbach's alpha coefficient was 0.69; in our study was 0.72.

Data Collection and Analysis

Data were collected face-to-face based on voluntary participation. Participants were informed that the data would be used solely for scientific purposes, that confidentiality would be maintained, and that they could withdraw from the study at any time. This study was conducted in strict adherence to the ethical principles of the Declaration of Helsinki and was approved by the Ethics Committee of University. Before conducting the analyses, assumptions of multiple regression were tested, including univariate and multivariate normality, singularity, multicollinearity, and autocorrelation. The skewness (0.091 to 0.503) and kurtosis (–0.277 to 0.471) values were within the acceptable range for univariate normality [32]. Multivariate normality was assessed using Mardia's normalized kurtosis coefficient via AMOS software. The critical ratio (c.r) was 0.736, which is below the cut-off value of 5, indicating that the assumption of multivariate normality was met [33]. The absence of high correlations among variables indicated no singularity problem. VIF values (1.094–1.347) and Tolerance values (0.742–0.914) confirmed the absence of multicollinearity. The Durbin–Watson statistic was 1.687, indicating no autocorrelation. To assess common method bias, the variance inflation factor (VIF) was also examined, as recommended by Kock [34]. The VIF values ranged from 1.094 to 1.347, which are below the critical threshold of 3.3, suggesting that common method bias was not a concern. Additionally, Harman's Single Factor Test was performed and it was determined that the explained variance

(48%) was less than 50%, indicating that common method bias was not present. Data were analyzed using SPSS software and the PROCESS macro add-on developed by Hayes [26]. Mediation, moderation, and conditional process analyses were conducted using PROCESS Models 4, 1, and 14, respectively. This macro employs a non-parametric bootstrap method and conducts analyses based on 10,000 resamples within a 95% confidence interval. Moderation effects were evaluated based on the significance of the interaction term (X*W) and whether the upper and lower bounds of the confidence interval excluded zero. The mediation effect was assessed by computing direct, indirect, and total effects of the independent variable on the dependent variable. The effectiveness of the mediator variable was determined using the bootstrap confidence interval. If the lower and upper bounds (BootLLCI–BootULCI) did not include zero, mediation was deemed significant.

An important strength of the bootstrap method is its ability to reduce Type II error [35]. Moderated mediation effects were evaluated based on the significance of conditional direct and indirect effects and whether their confidence intervals excluded zero.

Results

Preliminary Analyses

There was no significant difference in participants' internet addiction levels by gender (t_{704} = −1.967). However, internet addiction significantly differed by age group (F = 14.583, p <.001). According to the results of the Bonferroni post-hoc test, the internet addiction scores of the 18–25 age group (X = 22.12) were significantly higher than those of the 31–35 (X = 19.68), 36–40(X = 18.27), 41–50 (X = 17.62), and 51– (X = 16.73) age groups. The scores of the 26–30 (X = 20.19) age group were also significantly higher than those of the 41–50 (X = 17.62) and 51–65 (X = 16.37) age groups. Internet addiction levels did not significantly differ by education level (F = 1.848, p >.05). However, there was a significant difference based on marital status. According to the Bonferroni post-hoc test, single individuals (X = 21.24) had significantly higher internet addiction levels than married (X = 17.66) and divorced individuals (X = 18.78).

According to the Table 1, alexithymia was positively correlated with internet addiction (r =.352, p <.01). Alexithymia was negatively correlated with sense of coherence (r =−.473, p <.01) and positive childhood experiences (r =−.211, p <.01). Internet addiction was negatively correlated with sense of coherence (r =−.370, p <.01) and positive childhood experi-

Table 1 Descriptive statistics of the variables and their correlations

Variables	*N*	M/Se	Sd	Skewness	Kurtosis	Al	IA	SC	PCE
Al	706	49.24/0.355	9.45	0.091	−0.386	-			
IA	706	18.92/0.234	6.23	0.503	−0.361	0.352**	-		
SC	706	54.43/0.398	10.59	0.128	0.471	−0.473**	−0.370**	-	
PCE	706	23.59/0.208	5.52	−0.382	−0.277	−0.211**	−0.118**	0.280**	-

**p <.01, *p<.05, Al: Alexithymia, IA: Internet Addiction, SC: Sense of Coherence, PCE: Positive Childhood Experiences

ences (r=−.118, p <.01). A positive correlation was found between sense of coherence and positive childhood experiences (r =.280, p <.01).

Hypothesis Testing

H1: Alexithymia Indirectly Affects Internet Addiction Through the Sense of Coherence (Model 4)

After controlling for gender and age, the mediating role of sense of coherence in the relationship between alexithymia and internet addiction was examined. The results showed that alexithymia significantly and negatively predicted sense of coherence (b = −0.5124, 95% CI [−0.5850, −0.4399], t = −13.85, p <.001). Sense of coherence significantly and negatively predicted internet addiction (b = −0.1279, 95% CI [−0.1724, −0.0834], t = −5.64, p <.01). Alexithymia positively and significantly predicted internet addiction (path c) (b=0.2074, 95% CI [0.1628, 0.2519], t=9.14, p <.001). When the mediator sense of coherence was included in the model, alexithymia still significantly predicted internet addiction (path c') (b=0.1418, 95% CI [0.0926, 0.1910], t=5.66, p <.001). The indirect effect through sense of coherence was (b=0.0655, 95% CI [0.0409, 0.0923]), indicating that sense of coherence partially mediated the relationship between alexithymia and internet addiction. According to Model 1, the predictor variables included in the analysis explained approximately 23% of the variance in internet addiction (R^2 = 0.2271). The decrease from the total effect (c = 0.2074) to the direct effect (c' = 0.1418), and the confidence interval for the indirect effect not including zero, indicated a mediating effect. Thus, Hypothesis 1was supported.

H2: Positive Childhood Experiences Moderate the Relationship between Sense of Coherence and Internet Addiction

After controlling for gender and age, the moderation analysis revealed that the sense of coherence did not significantly predict internet addiction (b=0.0621, 95% CI [−0.1120, 0.2361], t=0.7002, p >.05). However, positive childhood experiences predicted internet addiction (b=0.5158, 95% CI [0.1331, 0.8985], t=2.646, p <.05), as was the interaction effect (Int_1) (b = −0.0101, 95% CI [−0.0144, −0.0021], t = −2.84, p <.05). According to Model 2, all predictor variables included explained approximately 20% of the variance in internet addiction (R^2 = 0.2016). The significance of the interaction term and the confidence interval not including zero indicate a moderation effect. Therefore, Hypothesis 2 was supported.

According to Table 2, sense of coherence significantly reduced internet addiction at low (b = −0.1114, p <.01), medium (b = −0.1811, p <.001), and high (b = −0.1414, p <.001) levels of positive childhood experiences. These findings showed that positive childhood experiences were a strong moderator across all levels. The slope graph in Fig. 2 provided a visual representation of this moderating role.

Table 2 Conditional effects by different levels of the moderator

PCE	B	Se	T	*P*	LLCI	ULCI
Low	−0.1114	0.0330	−3.3778	0.0008	−0.1762	−0.0467
Medium	−0.1811	0.0214	−8.4813	0.0000	−0.2231	−0.1392
High	−0.1414	0.0274	−8.4737	0.0000	−0.2855	−0.1781

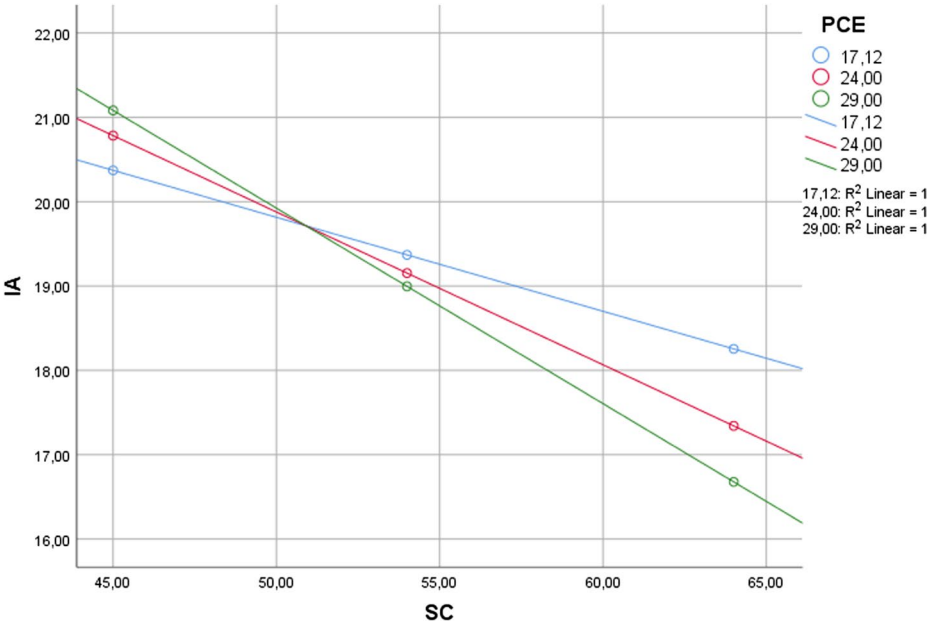

Fig. 2 Slope graph of the moderation effect of positive childhood experiences

The downward slopes in the graph at low, medium, and high levels of positive childhood experiences suggested that as sense of coherence was increasing, internet addiction was decreasing at all levels of childhood experiences.

H3: Positive Childhood Experiences Moderate the Indirect Effect of Alexithymia on Internet Addiction Through Sense of Coherence

Analyses conducted to test Hypothesis 3 found that alexithymia significantly and negatively predicted sense of coherence (b = −0.5124, 95% CI [−0.5850, −0.4399], t = −13.85, p <.001). The effect of sense of coherence on internet addiction was not significant (b = 0.0867, 95% CI [−0.0841, 0.2575], t = 0.9969, p >.05). However, the indirect effect of alexithymia on internet addiction was significant (b = 0.1372, 95% CI [0.0879, 0.1864], t = 5.46, p <.001). The effect of positive childhood experiences on internet addiction was also significant (b = 0.4665, 95% CI [0.0911, 0.8420], t = 2.44, p <.05), as was the interaction effect (SC*PCE) (b = −0.0089, 95% CI [−0.0157, −0.0020], t = −2.54, p <.05). According to Model 3, the included variables explained approximately 23% of the variance in internet addiction (R^2 = 0.2343). When examining the moderating effect of positive childhood experiences, it was found that at low levels of positive childhood experiences, the effect of alexithymia on internet addiction through sense of coherence was not moderated (b = −0.0654, 95% CI [−0.1310, 0.001], t = −1.96, p >.05). However, at moderate levels of positive childhood experiences (b = −0.1266, 95% CI [−0.1721, −0.0811], t = −5.46, p <.001), and at high levels (b = −0.1710, 95% CI [−0.2280, −0.1140], t = −5.89, p <.001), a significant moderating effect was observed.

In other words, the effect of sense of coherence on internet addiction was not significant among individuals with low levels of positive childhood experiences. However, for those with moderate and high levels of positive childhood experiences, internet addiction was decreasing as sense of coherence was increasing.

When examining the moderated mediation index, the obtained values indicated that the moderated mediation effect was statistically significant (b = 0.0046, 95% CI [0.0008, 0.0083]).

Accordingly, Hypothesis 3 was supported. The significance of the moderated mediation effect was presented in Fig. 3.

According to Fig. 3, in the indirect effect of alexithymia on internet addiction through sense of coherence, the slope was relatively small and not significant at low levels of positive childhood experiences, whereas at moderate and high levels of positive childhood experiences, the slope was steeper and the moderating effect was significant.

Discussion

The present study investigated the relationships between alexithymia, sense of coherence, and internet addiction, with a particular focus on the moderating role of positive childhood experiences (PCEs). Consistent with our hypotheses and prior theoretical frameworks, our findings offer important contributions to the understanding of how emotional regulation difficulties and early developmental contexts shape behavioral addiction in the digital era.

First, aligning with previous studies [6, 7], we found that alexithymia indirectly predicted internet addiction through a weakened sense of coherence. This mediating mechanism is

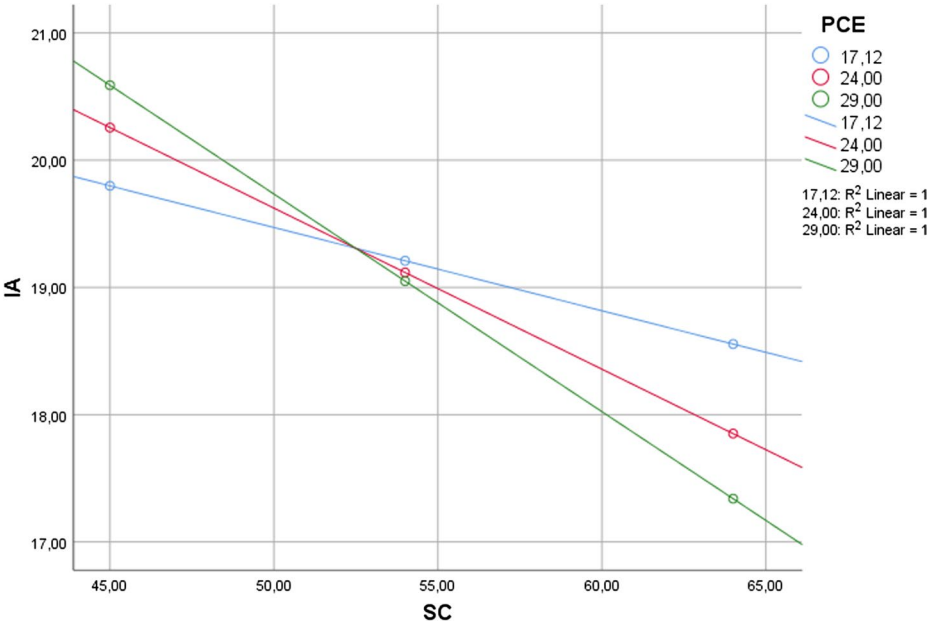

Fig. 3 Slope graph of the moderated mediation effect of positive childhood experiences

theoretically grounded in Antonovsky's [13] salutogenic model, which emphasizes that individuals with a strong sense of coherence are more likely to manage stress adaptively and maintain psychological resilience. Our findings supported the notion that individuals with high alexithymic traits, characterized by difficulty in recognizing and verbalizing emotions, are more likely to report difficulties in developing a coherent, manageable, and meaningful understanding of life events, which may be linked to greater reliance on maladaptive coping strategies such as compulsive internet use. Recent literature corroborates these mechanisms. For instance, Huang et al. [19] demonstrated that alexithymia was negatively associated with emotional clarity and meaningfulness, which are central components of sense of coherence. Similarly, Kösler et al. [17] highlighted that individuals with lower sense of coherence scores report greater psychological distress and are more prone to behavioral addictions, including problematic technology use. Our findings extended this literature by empirically validating sense of coherence as a statistically significant indirect pathway linking alexithymia and internet addiction among young adults.

Second, and importantly, our results indicated that PCEs moderate the relationship between sense of coherence and internet addiction. Specifically, individuals with higher levels of PCEs were less likely to exhibit internet addiction symptoms, even when their sense of coherence was relatively low. This finding aligns with developmental and resilience theories positing that early positive experiences promote emotional security, executive functioning, and self-regulatory capacity [20–22]. Importantly, PCEs have been linked to adaptive neurodevelopmental pathways that enable individuals to form secure attachments, interpret life events coherently, and maintain emotional equilibrium under stress [36, 37]. Indeed, recent research by Masten et al. [38] underscores that individuals with high levels of early emotional support display sustained self-regulatory capacities and reduced engagement in risk behaviors during adolescence and young adulthood. Furthermore, Zhang et al. [39] illustrated the critical impact of supportive parenting on children's self-regulation and behavioral adjustment. Their study reveals that early supportive parenting fosters a foundation for emotional regulation, resulting in children who are better equipped to navigate stressors without resorting to substances or addictive behaviors, including excessive internet use.

Moreover, our moderated mediation analysis revealed that PCEs moderated the indirect association between alexithymia and internet addiction through sense of coherence. This finding underscores the long-term relevance of nurturing environments during childhood. Individuals with rich emotional support and positive relational experiences in early life tend to report a more stable self-concept, more effective emotion regulation strategies, and stronger cognitive schemas for managing stress, which are associated with lower vulnerability in the context of alexithymia and a weak sense of coherence [23, 40]. Furthermore, supportive childhood environments have been associated with the development of stable internal working models and coherent identity structures, which enhance one's ability to regulate affect without resorting to maladaptive coping mechanisms [36]. Consistent with these findings, recent studies have shown that positive relational experiences play a crucial role in mitigating the link between alexithymia and maladaptive behaviors. For instance, Li et al. [11] demonstrated that reciprocal filial piety moderated the indirect effect of meaning in life on the relationship between alexithymia and internet addiction, suggesting that positive family dynamics can buffer against internet addiction. Additionally, research on metacognitive beliefs by Luo et al. (2022a) has highlighted how adaptive cognitive frameworks, shaped by

early relational experiences, can weaken the link between alexithymia and internet addiction (e.g., through enhanced cognitive confidence and reduced need for thought control). Moreover, emotion regulation strategies have been identified as a key mediator between alexithymia and Internet addiction. Network analyses have pinpointed "catastrophizing" and "externally oriented thinking" as critical nodes connecting alexithymia to maladaptive coping mechanisms like excessive internet use [16]. Taken together, these findings highlight that positive early relational experiences serve as contextual psychological resources that moderate the vulnerability patterns associated with alexithymia and weakened sense of coherence and thus reducing susceptibility to internet addiction.

Theoretically, these results offer support for a developmental–transactional perspective [41], suggesting that emotional and cognitive vulnerabilities (e.g., alexithymia, low coherence) interact with environmental assets (e.g., PCEs) to shape behavioral outcomes such as internet addiction.

From a practical standpoint, the findings have significant implications. Interventions targeting internet addiction should not solely focus on behavioral symptoms but also address underlying emotional processing deficits and self-concept coherence. Cognitive-behavioral and emotion-focused therapies could be tailored to enhance emotional granularity and help individuals restructure their internal narratives [42]. Moreover, preventive strategies that promote safe and nurturing childhood environments may be associated with long-term protective outcomes. Incorporating family-based psychoeducation, social-emotional learning programs, and policies that foster secure attachment in childhood may contribute to lower prevalence of maladaptive coping behaviors in adolescence and adulthood.

This study also contributes to the growing body of research emphasizing the importance of sense of coherence in mental health outcomes [14, 18]. In digital contexts where escape and stimulation are readily available, a coherent life orientation may be associated with reduced reliance on online platforms for emotional regulation. Future studies could explore how enhancing coherence through positive psychology interventions, such as meaning-making, mindfulness, and gratitude practices, may decrease behavioral addictions among vulnerable groups.

Despite its strengths, this study is not without limitations. The cross-sectional design limits causal inference, and future longitudinal or experimental research is needed to confirm the directional nature of the proposed mechanisms. Additionally, although the study focuses on a sample of emerging adults, future research could expand to adolescent populations or explore cross-cultural variations in the roles of PCEs and coherence. Lastly, reliance on self-report measures may introduce social desirability or recall biases, although well-validated instruments were used to minimize this risk.

Conclusion

In sum, this study advances understanding of internet addiction by demonstrating how alexithymia is associated with internet addiction through sense of coherence and how positive childhood experiences moderate these associations. These findings not only reinforce the multifaceted nature of internet addiction but also emphasize the enduring impact of early emotional environments and the importance of self-coherence in maintaining well-being in the digital age. Tailoring interventions to strengthen emotional awareness and coherence, while fostering positive early-life experiences, may prove instrumental in controlling the rise of internet addiction.

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Data Availability The data that support the findings of this study are available from the corresponding author upon reasonable request.

Declarations

Ethics Approval This study was conducted in strict accordance with the ethical standards of the Declaration of Helsinki and was approved by the Social and Human Sciences Ethics Committee of Sakarya University (Project number: 18.03.2025-E.458800).

Informed Consent Informed consent was obtained from all individual participants included in the study.

Conflict of Interest The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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