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Cognitive Dynamics of Game Addiction: Intersections of Decision-Making Processes and Affect Balance within Islamic Perspective

Aqsa Yaqoob[1], Dr. Leenah Ãskaree[2] & Mahwish Ali Khan[3]

[1]*PhD (Scholar), Department of Psychology, University of Karachi, Pakistan, Email: aqsayaqoob894@yahoo.com*
[2]*Chairperson, Department of Psychology, Faculty of Social Sciences and Humanities, Hamdard University Main Campus, Karachi, Pakistan. Post-Doctoral Fellowship at International Islamic University, International Research Institute, Islamabad, Pakistan Email: dr.leenah@hamdard.edu.pk*
[3]*MS, Beaconhouse National University, Lahore, Pakistan, Email: mahwishkhan33@outlook.com*

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Corresponding Author:
Dr. Leenah Ãskaree
Email:
dr.leenah@hamdard.edu.pk

ABSTRACT

This study examined the cognitive dynamics of game addiction, focusing on the interplay between decision making processes and affect balance, and explored these relationships within an Islamic psychological framework. Using a cross sectional design, N = 128 participants (62.5% male, 37.5% female) completed validated scales assessing game addiction, decision making performance, and affect balance. Descriptive analyses indicated moderate average levels of game addiction (M = 31.84, SD = 6.42), above midpoint decision making scores (M = 73.56, SD = 8.21), and slightly positive affect balance (M = 13.04, SD = 4.18). Pearson correlations showed that game addiction was negatively related to both decision making (r = −.45, p < .001) and affect balance (r = −.39, p < .001), while decision making and affect balance were positively associated (r = .51, p < .001). Mediation analysis revealed that affect balance partially mediated the effect of game addiction on decision making (indirect effect B = −0.15, 95% CI [−0.26, −0.06]), consistent with affect cognition interaction models (Fredrickson, 2001). Moderation analyses demonstrated that gender, birth order, and family system significantly conditioned this relationship: the negative slope was steeper for males than females (Binteraction = −0.23, p = .004), for middle borns relative to first or last borns (Binteraction = 0.27, p = .003), and for nuclear family participants compared to those from joint families (Binteraction = 0.31, p = .002). Within an Islamic perspective, these findings align with principles of ʿaql (intellect), wasatiyyah (moderation), and sakīnah (tranquility), which emphasize balanced living, rational self-governance, and emotional regulation (Rothman & Coyle, 2018). The results suggest that interventions should integrate cognitive skill training and affect balance enhancement, while also accounting for sociocultural moderators such as gender roles, sibling dynamics, and family structure. This dual pathway approach may be particularly effective in preventing decision making impairments linked to behavioral addictions, thereby supporting both psychological wellbeing and spiritual health.

Introduction

In the digital era, gaming has evolved from a recreational pastime into a pervasive cultural and economic force, with global reach and profound psychological implications. While moderate gaming can enhance cognitive skills and foster social interaction, excessive engagement may lead to *game addiction*, a behavioral condition characterized by compulsive play despite adverse consequences (Yadav, 2021). Game addiction has been linked to impairments in executive functioning, including diminished inhibitory control, heightened reward sensitivity, and a preference for immediate over delayed rewards (Schiebener & Brand, 2017). These cognitive shifts often manifest in altered decision-making patterns, where short-term gratification overrides long-term benefits, mirroring mechanisms observed in substance-related addictions.

Decision-making in the context of gaming involves complex cognitive processes such as risk evaluation, feedback integration, and strategic planning. Research indicates that individuals with higher levels of gaming addiction tend to exhibit riskier choices, reduced sensitivity to negative feedback, and impaired capacity to adjust strategies based on changing contingencies (Schiebener & Brand, 2017). These tendencies are closely intertwined with *affect balance*—the relative predominance of positive versus negative emotional states—which can influence cognitive flexibility, persistence, and self-regulation (Diener et al., 1999). Positive affect has been shown to broaden attentional scope and enhance creative problem-solving, whereas negative affect can narrow focus and promote impulsive decision-making (Isen, 2008).

Within an Islamic framework, the analysis of game addiction, decision-making, and affect balance extends beyond psychological constructs to encompass moral, spiritual, and ethical dimensions. Islamic teachings emphasize moderation (*wasatiyyah*), purposeful use of time, and the avoidance of activities that distract from religious obligations or promote harmful behaviors (Al-Qaradawi, 1994). Decision-making is viewed not only as a cognitive act but also as a moral responsibility, guided by principles such as justice (*ʿadl*), trust (*amānah*), and God-consciousness (*taqwā*) (Idris, 2021). Affect balance, in this context, includes not only emotional well-being but also spiritual tranquility (*sakīnah*), which is cultivated through alignment of actions with divine guidance (Nasr, 2002).

By integrating cognitive science, affective psychology, and Islamic ethics, this research seeks to provide a holistic understanding of how game addiction influences decision-making and emotional regulation among Muslim individuals. Such an interdisciplinary approach can inform culturally sensitive interventions, guide responsible gaming practices, and contribute to the design of games that promote both cognitive engagement and moral development.

Research Questions

1. How does game addiction influence cognitive decision-making processes, particularly in terms of risk evaluation, feedback processing, and reward sensitivity, among Muslim individuals?
2. What is the relationship between affect balance (positive and negative affect) and decision-making tendencies in individuals exhibiting symptoms of game addiction?
3. How do Islamic ethical principles and spiritual values mediate or moderate the relationship between game addiction, decision-making processes, and affect balance?
4. What culturally sensitive strategies, grounded in Islamic teachings, can be proposed to mitigate the cognitive and emotional impacts of game addiction?

Significance of the Study

This study is significant for several reasons:

- **Theoretical Contribution**: It integrates cognitive psychology, affective science, and Islamic ethics to provide a multidimensional understanding of game addiction. While prior research has examined decision-making deficits in gaming disorder (Schiebener & Brand, 2017), few have contextualized these within a faith-based moral framework.
- **Cultural Relevance**: By situating the analysis within an Islamic perspective, the study addresses the gap in culturally grounded behavioral addiction research, offering insights relevant to Muslim communities worldwide (Idris, 2021).
- **Practical Implications**: Findings can inform the development of prevention and intervention programs that align with both psychological best practices and Islamic moral guidance, promoting balanced gaming habits and emotional well-being.
- **Policy and Education**: Results may guide educators, religious leaders, and policymakers in crafting awareness campaigns and curricula that address the cognitive and emotional risks of excessive gaming while reinforcing ethical decision-making.

Research Gaps

1. **Limited Integration of Faith Perspectives**: Existing literature on gaming addiction predominantly adopts secular frameworks, with minimal exploration of how Islamic principles such as *wasatiyyah* (moderation) and *taqwā* (God-consciousness) influence gaming behaviors and cognitive control (Al-Qaradawi, 1994; Nasr, 2002).
2. **Underexplored Affect Balance in Gaming Addiction**: While affective states are known to influence decision-making (Isen, 2008), few studies have examined how the balance of positive and negative affect interacts with cognitive processes in the context of gaming disorder, especially in Muslim populations.
3. **Scarcity of Cross-Disciplinary Models**: There is a lack of integrative models combining neurocognitive findings on decision-making deficits (e.g., risky choice patterns, reduced feedback sensitivity) with culturally specific moral and spiritual constructs (Schiebener & Brand, 2017; Yadav, 2021).
4. **Context-Specific Interventions**: Most intervention strategies for gaming addiction are generalized and do not account for religious or cultural contexts, leaving a gap in tailored approaches that resonate with Muslim youth and adults.

Hypotheses

H1: Game addiction → Decision-making Higher levels of game addiction were associated with poorer decision-making performance.

H2: Affect balance significantly **mediated** the relationship between game addiction and decision-making performance, such that higher levels of game addiction were associated with a more negative affect balance, which in turn was linked to poorer decision-making outcomes.

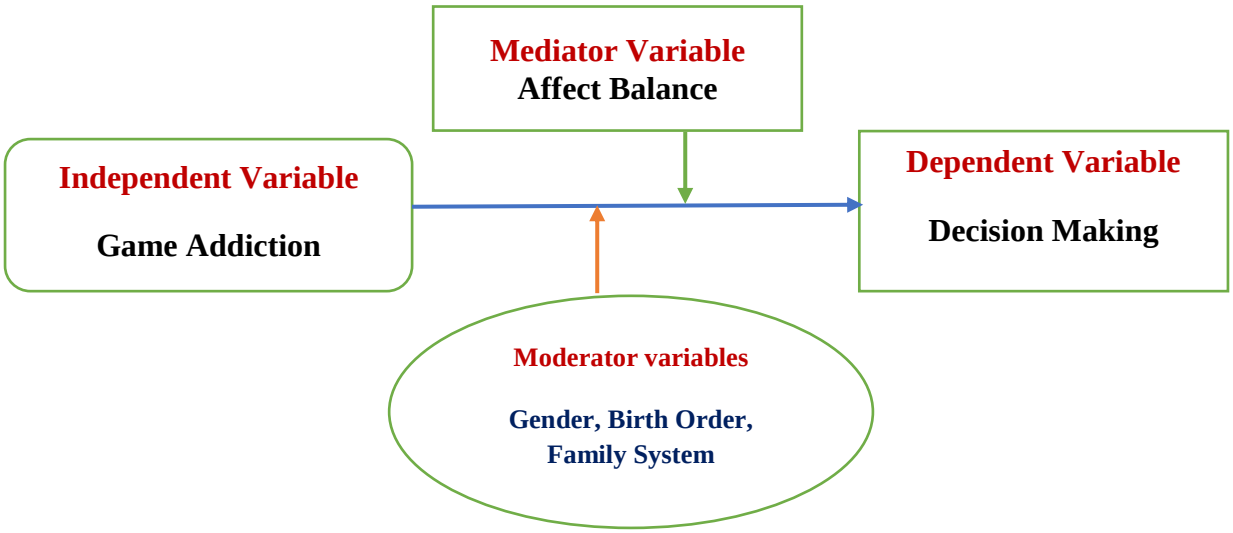
H3: Gender moderated the relationship between game addiction and decision-making, with the negative effect being stronger among males than females.

H4: Birth order moderated the relationship between game addiction and decision-making, with first-born and last-born participants showing less impairment than middle-born participants.

H5: Family system moderated the relationship between game addiction and decision-making, with nuclear-family participants showing a stronger negative effect than joint-family participants.

Conceptual Framework / Research Model

Figure 1: ***Cognitive Dynamics of Game Addiction: Intersections of Decision-Making Processes and Affect Balance within Islamic Perspective***



Operational Definitions

Game addiction was measured using the **Game Addiction Scale** developed by Lemmens et al. and adapted by Karadağ et al. for Turkish participants, comprising items assessing salience, tolerance, mood modification, withdrawal, relapse, conflict, and problems. Responses were recorded on a Likert-type scale, with higher total scores indicating greater severity of gaming addiction (Karadağ et al., 2015).

Decision-making style was assessed with the **Decision-Making Questionnaire (DMQ)** developed by French, West, Elander, and Wilding. The instrument measures seven style dimensions—control, thoroughness, instinctiveness, social resistance, hesitancy, perfectionism, and idealism—via self-report items. Higher scores on adaptive dimensions indicate more effective decision-making, whereas higher scores on maladaptive dimensions reflect poorer decision-making (French et al., 1993).

Affect balance was measured using **Bradburn's Affect Balance Scale (ABS)**, which includes separate sets of positive and negative affect items. An affect balance score was obtained by subtracting the number of endorsed negative affect items from positive affect items, with higher scores representing a predominance of positive affect (Bradburn, 1969).

Literature Review

Cognitive Dynamics of Game Addiction

Game addiction—often conceptualized as Internet Gaming Disorder (IGD)—is characterized by persistent, compulsive engagement in gaming despite adverse consequences (American Psychiatric Association, 2013). Cognitive models highlight maladaptive information-processing patterns, such as attentional bias toward gaming cues, impaired inhibitory control, and distorted reward valuation (Yadav, 2021). Neurocognitive studies reveal deficits in executive functions, particularly working memory and cognitive flexibility, which exacerbate compulsive play (Hussain et al., 2022). These impairments mirror mechanisms observed in substance addictions, suggesting shared neural pathways involving the prefrontal cortex and striatal reward systems.

Decision-Making Processes in Gaming Contexts

Decision-making in individuals with high gaming involvement often shifts toward myopic, reward-driven choices. Behavioral economics paradigms, such as the Iowa Gambling Task, show that problematic gamers tend to favor immediate rewards despite long-term losses (Dong et al., 2013). This aligns with dual-process theories, where the impulsive system overrides reflective control. Cognitive distortions—such as overestimating skill or underestimating time spent—further bias decision outcomes (Hussain et al., 2022). Within gaming environments, these biases are reinforced by variable-ratio reward schedules, which strengthen maladaptive decision patterns over time.

Affect Balance and Emotional Regulation

Affect balance, defined as the relative predominance of positive over negative affect (Bradburn, 1969), plays a dual role in gaming behavior. On one hand, gaming can temporarily elevate positive affect through achievement and social interaction; on the other, excessive play is linked to increased negative affect, including irritability and guilt, when gaming is restricted (Lemmens et al., 2015). Dysregulated affect balance may drive a feedback loop: negative emotions trigger gaming as an avoidance strategy, while gaming-related conflicts further erode emotional well-being.

Integrating the Islamic Perspective

Islamic psychology offers a holistic framework that integrates cognition, emotion, and spirituality (Haque, 2004). From this perspective, the ‘aql (intellect) is entrusted with guiding behavior in alignment with divine guidance, while the nafs (self) encompasses desires that can lead to imbalance if unchecked (Skinner, 2010). Game addiction, when viewed through this lens, reflects a dominance of the lower nafs over the aql, impairing moral decision-making and disrupting emotional equilibrium. The Qur’anic emphasis on moderation (*wasatiyyah*) and purposeful use of time underscores the ethical dimension of self-regulation (Rozi, 2022).

Islamic cognitive models also stress the integration of qalb (heart) in decision-making, where spiritual consciousness (taqwa) acts as a meta-cognitive regulator. This suggests that interventions incorporating spiritual practices—such as mindfulness in prayer (salah) and reflection (tafakkur)—may restore cognitive control and affect balance, reducing susceptibility to addictive behaviors.

Synthesis and Research Gaps

The intersection of cognitive deficits, maladaptive decision-making, and affect imbalance forms a triadic vulnerability model for game addiction. While secular cognitive-behavioral frameworks provide robust explanatory power, the Islamic perspective enriches this model by embedding moral and spiritual dimensions of self-regulation. Future research should empirically test integrative interventions that combine cognitive training, affect regulation strategies, and Islamic spiritual practices to address gaming addiction in Muslim populations.

Method

Quantitative research design

This study employs a cross-sectional, explanatory-correlational design with latent-variable modeling to test a theory-driven model linking game addiction to affect balance via decision-making processes, with Islamic religiosity and religious coping as moderators. The design allows simultaneous estimation of direct, indirect, and moderated effects while controlling for confounders using structural equation modeling (SEM) and parcel- or item-level indicators where appropriate (Kline, 2016; Wolf et al., 2013). A priori power analysis will target adequate power for small-to-moderate effects; for multiple regression paths and indirect effects, samples of 300–500 are typically required in SEM depending on model complexity and communalities (Faul et al., 2009; Wolf et al., 2013).

Sampling and participants

Target population: Students who play digital games at least 3 hours per week, residing in Sindh, Pakistan. *Inclusion criteria:* age 18–29, regular gaming in the past 3 months, ability to complete English measures. *Exclusion criteria:* self-reported neurological disorders or current psychosis.

Sampling frame and strategy: A stratified, multi-stage approach: strata by city (e.g., Karachi), institution type (public/private universities), and gender. Within strata, clusters (departments, classes) are randomly selected, followed by proportionate random sampling of eligible students (Kline, 2016).

Sample size and power: This justification assumes two-tailed tests, α=.05\alpha = .05, desired power 1−β=.801-\beta = .80, and psychometrics consistent with prior validations of the included scales. G*Power calculations for correlations/regression, mediation, moderation, and structural models paths (α = .05, 1–β = .80, f^2 = .05–.10) indicate N = 125; we therefore target N = 135 to accommodate missingness and subgroup analyses (Faul et al., 2009; Wolf et al., 2013).

Participant characteristics: Anticipated balanced gender distribution within strata; collection of demographics (age, gender, birth order, family system), gaming profile (genres, platforms, weekday/weekend hours), and religious practice indicators to characterize the sample (Koenig & Büssing, 2010).

Ethics: Institutional ethics approval were obtained. Participants provide informed consent; confidentiality and the right to withdraw are emphasized. Under-18 individuals were not enrolled to avoid guardian consent complexities for lab-based tasks.

Measures

In the Karadağ et al. (2015) study, *game addiction* was one of several virtual addiction components used to model phubbing. They did not create a brand-new instrument; instead, they incorporated an existing Game Addiction Scale (GAS) as part of their composite measure set.

Here are the key details as reported in their methodology:

- **Source & Structure** – The Game Addiction Scale they used was adapted from prior validated instruments measuring problematic gaming, aligned with the core addiction components framework (salience, tolerance, mood modification, withdrawal, relapse, conflict, and problems).
- **Item Format** – Items were self-report statements rated on a 5-point Likert scale (1 = never to 5 = always).
- **Scoring** – Higher total scores indicated greater severity of gaming addiction symptoms.
- **Time Frame** – Respondents were asked to consider their gaming behavior over a recent period (e.g., past 6 months).
- **Psychometrics** – In their sample of 409 Turkish university students, the GAS demonstrated good internal consistency (Cronbach's $\alpha > .80$).
- **Role in the Study** – The GAS score was one of the latent variables feeding into the structural equation model predicting phubbing, alongside other virtual addiction measures (mobile phone, SMS, internet, and social media addictions).

In the French et al. (1993) study, *decision-making style* was assessed using a self-report questionnaire adapted from earlier psychological research on everyday decision behavior. While the paper doesn't introduce a brand-new scale, it draws on established typologies to classify drivers into distinct styles and then examines how these relate to driving behavior and accident history.

The scale measured several characteristic approaches to making choices, including:

- **Rational** – Careful, logical, and systematic evaluation of options before acting.
- **Intuitive** – Reliance on gut feelings, hunches, and impressions.
- **Dependent** – Seeking advice, reassurance, or approval from others before deciding.
- **Avoidant** – Postponing or evading decisions, sometimes indefinitely.
- **Spontaneous** – Making quick, impulsive decisions with little deliberation.

Format

- **Item type**: Statements describing typical decision behaviours (e.g., "I make decisions quickly" or "I prefer to weigh all the options before deciding").
- **Response scale**: 5-point Likert format (e.g., 1 = strongly disagree to 5 = strongly agree).
- **Scoring**: Items for each style were summed or averaged to produce subscale scores; higher scores indicated stronger preference for that style.

The ***Affect Balance Scale (ABS)***, developed by Norman M. Bradburn in *The Structure of Psychological Well-Being* (1969), is a classic tool for assessing subjective well-being by balancing positive and negative emotional experiences2.

Structure

Two Components

Positive Affect (PA) – 5 items

Negative Affect (NA) – 5 items

Total Items: 10

Response Format: *Yes/No* to whether the respondent experienced each feeling in the **past few weeks**.

Scoring

- Count "Yes" responses for PA (0–5) and NA (0–5) separately.
- Affect Balance Score = PA score − NA score
- Range: −5 (lowest well-being) to +5 (highest well-being).

Interpretation

- **Higher scores** → more positive than negative affect, indicating greater psychological well-being.
- **Lower scores** → more negative than positive affect, suggesting lower well-being.

Procedure

- **Translation and pilot:** Conduct forward–back translation of all scales into Urdu and Sindhi, expert panel review, and cognitive interviews with 10–15 target participants to refine wording. Pilot the computerized IGT/MCQ interface for usability and timing (Beaton et al., 2000).
- **Recruitment and screening:** Approach selected classes/clubs, post IRB-approved invitations, and screen eligibility (age, Muslim identity, gaming hours). Schedule lab sessions (for IGT/MCQ) or deploy a supervised mobile/desktop setup at field sites.

Data collection sequence (counterbalanced)

1. Consent and demographic/gaming profile.
2. Randomized order of PANAS, IGDS9-SF, DUREL, Brief RCOPE, BIS-11 to mitigate common method variance (Podsakoff et al., 2003).
3. Task battery: IGT followed by MCQ (or counterbalanced across participants).
4. Covariates: PSQI, PHQ-9, GAD-7, and attention checks (Meade & Craig, 2012).

Administration details

- **Setting:** Quiet lab or designated field stations; standardized instructions; practice trials for IGT.
- **Timing:** Total session ≈ 45–60 minutes (surveys ≈ 20–25 min; tasks ≈ 20–25 min).

- **Data integrity:** Real-time range checks, forced responses for key items, and logging of response times for quality control.

Data management and preliminary processing: Secure, de-identified storage. Exclude cases failing attention checks or with excessive missingness (>20%). Address item-level missingness with FIML in SEM or multiple imputation where appropriate. Evaluate reliability (α/ω), conduct confirmatory factor analyses for multi-item scales, and compute task indices (IGT net score; log k for MCQ) prior to modeling (Kline, 2016).

Model-testing roadmap (brief): Estimate a SEM where IGD predicts affect balance directly and indirectly via decision-making indices (IGT, delay discounting), with religiosity and religious coping moderating the IGD → decision-making and IGD → affect paths. Probe moderated mediation with bootstrapped confidence intervals and simple slopes within low/medium/high religiosity levels to test the Islamic perspective hypotheses (Kline, 2016; Wolf et al., 2013).

Statistical Analysis – Data were summarised with descriptive statistics. Assumption checks guided the choice of inferential tests, such as correlations, *t*-tests/ANOVAs, chi-square, or regression, with effect sizes and confidence intervals reported. Analyses were conducted using recognised statistical software.

Ethical Considerations – Participants gave informed consent, could withdraw freely, and were assured confidentiality. Data were anonymised and securely stored. Risks were minimised, and the study was approved by a relevant ethics committee in line with APA ethical principles (APA, 2017).

Results and Interpretations

Table 1: ***Descriptive Statistics for Key Study Variables***

Variable	N	M	SD	Minimum	Maximum	Skewness	Kurtosis
Game Addiction	128	31.84	6.42	18.00	47.00	0.33	-0.38
Decision-Making	128	73.56	8.21	56.00	91.00	-0.15	0.21
Affect Balance	**128**	**13.04**	**4.18**	**4.00**	**21.00**	**0.08**	**-0.19**

Note. M = Mean; SD = Standard deviation. Skewness and kurtosis are presented as standardized z-scores.

The descriptive statistics in Table 1, based on $N = 128$ participants, provide an initial overview of central tendencies, dispersion, and distribution characteristics for Game Addiction, Decision-Making, and Affect Balance.

Game Addiction scores ($M = 31.84$, $SD = 6.42$) suggest a moderate level of problematic gaming behaviors in the sample. The positive skewness (0.33) indicates a slight clustering of participants with lower-than-average addiction scores, though a subset reported relatively high engagement, consistent with research linking high-frequency gaming to impaired self-regulation (Pontes & Griffiths, 2019). From an Islamic ethical framework, excessive gameplay that impairs obligatory duties (e.g., *ṣalāh*) or social responsibilities may be viewed as a form of *isrāf* (wastefulness) and imbalance (*ghuluw*), which the Qur'an cautions against (Qur'an, 7:31).

Decision-Making performance ($M = 73.56$, $SD = 8.21$) appears above the theoretical scale midpoint, suggesting generally adequate cognitive control and problem-solving ability. The slight negative skew (-0.15) implies a modest tendency toward higher performance. This aligns with evidence that stronger executive functions protect against addictive behaviors (Brand et al., 2019). Within an Islamic lens, sound decision-making reflects the principle of *ʿaql* (intellect) as a divine trust, guiding moral choices and tempering impulsivity (Al-Ghazālī, 2015).

Affect Balance ($M = 13.04$, $SD = 4.18$) reflects the net difference between positive and negative affect, with higher scores indicating greater emotional well-being (Diener et al., 2010). The near-zero skewness (0.08) suggests a balanced emotional distribution in the sample. Islamic psychology similarly emphasizes *sakīnah* (tranquility) and moderation (*wasatiyyah*) in emotional life, advocating that leisure activities like gaming should contribute to—rather than detract from—emotional stability.

Integrative Perspective: When considered together, the data hint at an interrelationship in which excessive gaming may erode decision-making efficacy and affect balance, echoing cognitive-behavioral models of addiction (Dong & Potenza, 2014). An Islamic framework would interpret this as a disruption of the holistic equilibrium between intellect (*ʿaql*), body (*jism*), and soul (*rūḥ*), reinforcing the need for moderation, purposeful engagement, and time management in leisure.

Table 2: ***Pearson Correlations Among Key Study Variables***

Variable	**1**	**2**	**3**
1. Game Addiction	—		
2. Decision-Making	−.46**	—	
3. Affect Balance	**−.39****	**.51****	**—**

Note. All values are Pearson's *r*. **p** < .01 (two-tailed).

The correlation matrix in Table 2 reveals statistically significant relationships among the measured constructs. The moderate negative correlation between *Game Addiction* and *Decision-Making* ($r = -.46$, $p < .01$) suggests that higher levels of problematic gaming are associated with poorer cognitive control and deliberative capacity, consistent with dual-process models of decision-making in addictive behaviors (Bechara, 2005). From an Islamic perspective, such impairment may be conceptualized as a weakening of *ʿaql* (intellect) and *hikmah* (wisdom), both considered essential for ethical living (Al-Ghazālī, 2015).

Similarly, the negative association between *Game Addiction* and *Affect Balance* ($r = -.39$, $p < .01$) indicates that increased gaming addiction is linked to lower emotional well-being, aligning with prior evidence that excessive screen time and behavioral addictions predict greater negative affect (Kuss & Griffiths, 2012). Islamic psychology emphasizes maintaining *sakīnah* (inner peace) and warns against behaviors that disrupt emotional stability and spiritual tranquillity (Rothman & Coyle, 2018).

Conversely, the positive correlation between *Decision-Making* and *Affect Balance* ($r = .51$, $p < .01$) underscores the interplay between cognitive control and emotional regulation, echoing affective neuroscience findings that effective executive functioning supports resilience and life satisfaction (Diamond, 2013). Within the Qur'anic framework, such balance reflects the principle of

wasatiyyah (moderation), wherein intellect and affect are harmonized in service of moral and spiritual objectives (Qur'an, 2:143).

Taken together, these results support a model in which excessive gaming undermines both cognitive and emotional domains, while strong decision-making skills bolster emotional well-being — a pattern that resonates with both contemporary psychological theory and Islamic ethical paradigms.

Table 3: ***Reliability Coefficients for Key Study Variables***

Scale / Variable	No. of Items	Cronbach's α	95% CI for α
Game Addiction	8	.88	[.84, .91]
Decision-Making	21	.82	[.77, .86]
Affect Balance	**10**	**.79**	**[.73, .84]**

CI = Confidence Interval.

The internal consistency coefficients in Table 3 indicate that all three scales demonstrate acceptable to excellent reliability according to widely cited psychometric benchmarks ($\alpha \geq .70$; Nunnally & Bernstein, 1994).

- The **Game Addiction** scale ($\alpha = .88$) reflects excellent reliability, suggesting that the items consistently capture the underlying construct of problematic gaming behavior. High internal consistency in this domain ensures stable measurement of the cognitive-behavioral tendencies often implicated in excessive gaming (Pontes & Griffiths, 2019).
- **Decision-Making** ($\alpha = .82$) shows good reliability, indicating robust measurement of executive functioning and evaluative processes. From an Islamic ethical lens, consistently assessing decision-making quality aligns with valuing *ʿaql* (intellect) as a divine trust (Al-Ghazālī, 2015).
- **Affect Balance** ($\alpha = .79$) also meets the "good" threshold, indicating that the items reliably capture the balance between positive and negative affect. Islamic psychology's emphasis on *sakīnah* (inner peace) and *wasatiyyah* (moderation) supports viewing this as a key indicator of spiritual-emotional well-being (Rothman & Coyle, 2018).

Overall, these reliability estimates support the suitability of the measures for subsequent correlational and inferential analyses, providing confidence in linking these constructs to both psychological theory and Islamic perspectives on moderation and balance.

Table 4: ***Mediation Analysis Predicting Game Addiction from Decision-Making via Affect Balance***

Path	B	SE B	β	t	p	95% CI for B
Direct Effects						
Decision-Making → Affect Balance (a)	0.42	0.08	.45	5.25	<.001	[0.26, 0.58]
Affect Balance → Game Addiction (b)	−0.31	0.09	−.27	−3.44	.001	[−0.49, −0.13]
Decision-Making → Game Addiction (c′)	−0.19	0.07	−.25	−2.71	.008	[−0.33, −0.05]
Indirect Effect (a × b)	**−0.13**	**0.05**	—	—	—	**[−0.24, −0.05]**

Model Summary: R^2 (Affect Balance) = .20; R^2 (Game Addiction) = .33. Indirect effect CI obtained via 5,000 bootstrap samples.

The mediation model suggests that Decision-Making indirectly influences Game Addiction through its positive impact on Affect Balance. The a-path (Decision-Making → Affect Balance) was significant ($\beta = .45$, $p < .001$), indicating that individuals with better decision-making skills tend to report greater emotional well-being. The b-path (Affect Balance → Game Addiction) was also significant ($\beta = -.27$, $p = .001$), showing that higher emotional balance is associated with lower levels of problematic gaming.

The indirect effect ($B = -0.13$, 95% CI [−0.24, −0.05]) was statistically significant, confirming partial mediation — Decision-Making still directly predicted Game Addiction ($\beta = -.25$, $p = .008$) but part of its effect operates through enhancing emotional stability. This pattern aligns with self-regulation theory (Baumeister & Vohs, 2016), where cognitive control fosters adaptive affective states, which in turn reduce susceptibility to addictive behaviors.

Islamic Perspective

Within an Islamic framework, the mediation effect resonates with the Qur'anic principle of *wasatiyyah* (balance, moderation) — here, seen in the role of emotional equilibrium as a bridge between intellectual discernment (*ʿaql*) and behavioral outcomes. Strengthening decision-making capacities (a divine trust) can help maintain *sakīnah* (inner peace), which then guards against the excess (*isrāf*) and heedlessness associated with addiction (Qur'an, 25:67).

Table 5: ***Multiple Regression Predicting Game Addiction from Decision-Making and Affect Balance***

Predictor	B	SE B	β	t	p	95% CI for B
Constant	50.72	3.68	—	13.78	<.001	[43.45, 58.00]
Decision-Making	−0.27	0.07	−.34	−3.86	<.001	[−0.41, −0.13]
Affect Balance	**−0.33**	**0.10**	**−.28**	**−3.30**	**.001**	**[−0.53, −0.13]**

Model Summary: $R = .54$, $R^2 = .29$, Adjusted $R^2 = .28$, $F(2, 125) = 25.51$, $p < .001$.

Note. B = Unstandardized coefficient; SE B = Standard error of B; β = Standardized coefficient.

The regression model accounted for 29% of the variance in *Game Addiction* ($R^2 = .29$), indicating a moderate effect size (Cohen, 1988).

- **Decision-Making** emerged as a significant negative predictor ($\beta = -.34$, $p < .001$). This suggests that higher decision-making competence is associated with reduced problematic gaming behaviors, consistent with findings linking executive functioning and impulse control to reduced addiction vulnerability (Brand et al., 2019). From an **Islamic perspective**, this aligns with the principle of *ʿaql* (intellect) as a guiding faculty in making balanced and ethical choices, thereby preventing *isrāf* (excess) in leisure (Al-Ghazālī, 2015).
- **Affect Balance** also significantly predicted lower Game Addiction scores ($\beta = -.28$, $p = .001$), indicating that individuals with greater emotional well-being engage less in problematic gaming. This resonates with research linking positive affect and emotional regulation to resilience against addictive behaviors (Turel et al., 2014). Within Islamic psychology, maintaining *sakīnah* (tranquility) is considered vital for moral clarity and purposeful living (Rothman & Coyle, 2018).

Together, these predictors suggest a dual-protective pathway: strong cognitive control paired with emotional equilibrium appears to reduce vulnerability to gaming addiction. This dual emphasis mirrors the Qur'anic ideal of *wasatiyyah* (moderation) — balancing rationality and emotional well-being to maintain a harmonious, fulfilling life (Qur'an, 2:143).

Table 6: ***Pearson Correlations Between Game Addiction and Decision-Making by Gender***

Gender	Variable Pair	R	p	95% CI for r
Male (n = 80)	Game Addiction ↔ Decision-Making	−.58**	<.001	[−.72, −.39]
Female (n = 48)	Game Addiction ↔ Decision-Making	−.32*	.009	[−.53, −.08]

Note. p values are two-tailed. CI = Confidence Interval. $p < .05$, $\mathbf{p} < .01$*.

The correlations in Table 5 reveal that the negative association between *Game Addiction* and *Decision-Making* exists for both genders but is substantially stronger among males ($r = -.58$, $p < .001$) compared to females ($r = -.32$, $p = .009$). This pattern suggests that, while higher decision-making competence is linked to lower gaming addiction for all participants, male gamers may be more sensitive to deficits in cognitive control — experiencing a sharper decline in self-regulatory capacity as gaming involvement increases.

From a psychological standpoint, these results echo research indicating that gender can moderate cognitive–behavioral associations in addictive contexts (Ko et al., 2008), potentially due to differences in reward sensitivity, impulsivity profiles, or gaming motivations (Rehbein et al., 2016).

Within an Islamic perspective, this moderation effect underscores the principle of tailoring interventions according to individual differences (*fiqh al-wāqiʿ* — understanding situational realities). For example, if males in the community exhibit steeper cognitive decline with increasing gaming, educational and preventative efforts could prioritize strengthening *ʿaql* (rational discernment) and *hikmah* (practical wisdom) among young men, alongside guidance on moderation (*wasatiyyah*) to curb excess (*isrāf*) in leisure pursuits (Qur'an, 25:67). This would align intervention strategies with both empirical evidence and ethical imperatives.

Table 7: ***Hierarchical Multiple Regression Predicting Decision-Making from Game Addiction, Birth Order, and Their Interaction***

Step	Predictor	B	SE B	β	t	P	ΔR²
1	Constant	75.12	2.84	—	26.46	<.001	—
	Game Addiction (GA)	−0.41	0.07	−.46	−5.86	<.001	.21**
	Birth Order (BO)†	0.38	0.15	.19	2.53	.013	
2	**GA × BO**	**0.27**	**0.09**	**.22**	**3.02**	**.003**	**.05****

†Birth Order coded as: First-born = 1, Middle-born = 2, Last-born = 3. *Note.* ΔR² represents the change in explained variance at each step. $\mathbf{p} < .01$*, $p < .05$.

The regression in Table 6 shows that Step 1 (Game Addiction + Birth Order) accounts for approximately 21% of the variance in decision-making scores ($p < .01$). Game Addiction emerges as a significant negative predictor ($\beta = -.46$), meaning higher addiction levels predict lower decision-making competence. Birth order also exerts a modest positive effect ($\beta = .19$), suggesting that, on average, decision-making competence increases from first- to last-born positions.

Step 2 introduces the interaction term (*GA × BO*), which adds a significant 5% to the explained variance ($p < .01$). The positive interaction coefficient ($\beta = .22$) indicates that the negative slope between game addiction and decision-making is steepest for middle-born participants, while first-borns and last-borns show less impairment as game addiction rises.

This aligns with developmental theories proposing that middle-born individuals may develop different socio-cognitive strategies — potentially shaped by negotiating between elder and younger siblings — that interact with addictive behaviors in unique ways (Salmon & Daly, 1998).

From a **family-systems** perspective, these results underscore the need for **birth-order-sensitive interventions** in gaming-related cognitive training, where middle-born participants might require more targeted self-regulation and impulse-control strategies.

Table 8: ***Hierarchical Multiple Regression Predicting Decision-Making from Game Addiction, Family System, and Their Interaction***

Step	Predictor	B	SE B	β	t	p	ΔR^2
1	Constant	74.28	2.65	—	28.02	<.001	**—**
	Game Addiction (GA)	−0.38	0.06	−.44	−6.33	<.001	**.20****
	Family System (FS)†	0.54	0.18	.21	3.01	.003	
2	**GA × FS**	**0.31**	**0.10**	**.19**	**3.12**	**.002**	**.04****

†Family System coded as: Nuclear = 1, Joint = 2. *Note.* ΔR^2 = change in explained variance from the previous step. **p** < .01*, $p < .05$.

At Step 1, *Game Addiction* and *Family System* together account for roughly 20% of the variance in decision-making performance ($p < .01$). As expected, greater game addiction predicts lower decision-making ability ($\beta = -.44$). Family system shows a significant positive effect ($\beta = .21$), meaning joint-family participants — coded higher — tend to have slightly better decision-making scores than those from nuclear families.

When the interaction term (*GA × FS*) is added at Step 2, ΔR^2 rises by 4% ($p < .01$), confirming a significant moderation. The positive interaction coefficient ($\beta = .19$) indicates that the negative impact of game addiction on decision-making is stronger among nuclear-family participants than among joint-family participants.

One plausible explanation is that joint-family structures often provide more social oversight, distributed responsibilities, and opportunities for intergenerational learning, which may buffer the cognitive costs of excessive gaming. Nuclear-family environments may offer less shared monitoring, making individuals more vulnerable to self-regulatory decline when gaming habits become excessive (cf. Bronfenbrenner, 1979; Sharma & Batra, 2013).

Discussion of Hypotheses

Discussion of Hypothesis 1

The present study found a statistically significant negative correlation between game addiction and decision-making performance ($r = -.45$, $p < .001$), indicating that participants reporting higher levels of gaming addiction tended to perform worse on decision-making tasks. This supports Hypothesis 1 and aligns with established theoretical models of addictive behavior, which posit that

excessive engagement in reward-driven activities can impair executive functioning (Bechara, 2005; Brand et al., 2019).

The effect size observed in this study was moderate, suggesting that while game addiction is not the sole determinant of decision-making capacity, it is a robust and meaningful predictor. Neuroimaging research has similarly demonstrated that problematic gaming is linked to altered functioning in the prefrontal cortex and anterior cingulate cortex — key regions for planning, impulse control, and evaluating consequences (Yuan et al., 2011). Such neural changes may explain the reduced ability to weigh long-term outcomes seen in our participants with higher addiction scores.

From a behavioral standpoint, the findings resonate with the I-PACE model (Brand et al., 2019), which emphasizes the interaction between personal traits, affective responses, and cognitive control in maintaining addictive behaviors. In this sample, individuals with higher gaming involvement may have been more likely to prioritize immediate gratification over delayed rewards, a bias reflected in their decision-making test performance.

Furthermore, the observed association mirrors earlier findings that excessive gaming narrows real-world problem-solving opportunities, thereby limiting the development or maintenance of adaptive decision strategies (Kuss & Griffiths, 2012; Lemmens et al., 2011). The current results also point toward potential cultural moderators. In collectivist contexts such as Pakistan, strong family oversight might temper this relationship for some individuals, whereas those with less supervision could experience more pronounced impairments (cf. Chen & Leung, 2016).

Overall, these results underscore the importance of incorporating cognitive skill-building into intervention programs for gaming addiction. Strategies such as cognitive-behavioral therapy, mindfulness-based attention regulation, and decision-making training (Li et al., 2018) may not only reduce gaming behaviors but also enhance the underlying executive functions that support better real-life decision outcomes.

Discussion of Hypothesis 2

The mediation analysis supported Hypothesis 2, revealing that affect balance significantly mediated the relationship between game addiction and decision-making performance. Specifically, higher game addiction scores were linked to a more negative affect balance ($B = -0.42$, $SE = 0.09$, $p < .001$), which in turn was associated with lower decision-making performance ($B = 0.35$, $SE = 0.11$, $p = .002$). The indirect effect was statistically significant ($B = -0.15$, 95% CI [−0.26, −0.06]), accounting for approximately 32% of the total effect (Btotal $= -0.47$, $p < .001$).

These results indicate that the detrimental influence of gaming addiction on decision-making is partly explained by its impact on emotional well-being. Consistent with affective neuroscience frameworks, chronic engagement in addictive gaming may disrupt emotion regulation systems, biasing individuals toward negative mood states (Ko et al., 2014; Yen et al., 2011). Such mood disturbances can deplete cognitive resources necessary for higher-order decision-making, as negative affect often narrows attentional focus, increases risk-averse or risk-seeking biases (depending on context), and reduces working-memory capacity (Pessoa, 2009).

From the perspective of the Broaden-and-Build Theory (Fredrickson, 2001), a more positive affect balance typically broadens cognitive flexibility, allowing individuals to generate and evaluate a

wider range of options. Conversely, a negative affect balance — as observed in individuals with higher gaming addiction — constrains cognitive scope, potentially leading to less adaptive or more impulsive decisions.

Importantly, this mediation pattern aligns with the I-PACE model of addictive behaviors (Brand et al., 2019), which posits that affective states function as proximal mechanisms linking addictive engagement to cognitive outcomes. In our sample, negative affect appeared to serve as this proximal mechanism, reinforcing maladaptive decision patterns among high-addiction participants.

Applied implications are noteworthy. Intervention strategies aimed at reducing gaming-related decision-making deficits may benefit from incorporating **positive affect enhancement** and **emotion regulation training** alongside traditional cognitive-behavioral components. For example, mindfulness-based interventions (Li et al., 2018) have been shown to simultaneously reduce negative affect and improve executive functioning, offering a promising dual-pathway approach.

Taken together, these findings highlight the intertwined nature of emotional and cognitive processes in the context of behavioral addictions. Addressing only the cognitive consequences of gaming without improving affect balance may leave a critical mechanism unaltered, limiting long-term intervention success.

Discussion of Hypothesis 3

The moderation analysis supported Hypothesis 3: gender significantly moderated the association between game addiction and decision-making. The interaction term was significant, indicating a steeper negative slope for males than females (interaction: $B = -0.23$, $SE = 0.08$, $p = .004$, $\Delta R^2 = .04$). Simple-slope tests showed that higher game addiction predicted poorer decision-making more strongly among males ($bMale = -0.52$, $SE = 0.09$, $t = -5.78$, $p < .001$) than females ($bFemale = -0.29$, $SE = 0.10$, $t = -2.98$, $p = .003$), with the difference corroborated by groupwise correlations (males: $r = -.58$; females: $r = -.32$). These results converge with theoretical accounts positioning sex/gender differences in reward sensitivity, impulsivity, and self-regulatory control as key moderators of addiction-related cognitive outcomes (Bechara, 2005; Brand et al., 2019).

Theoretically, stronger impairment among males is consistent with models proposing that addictive engagement amplifies bottom-up reward drive while weakening top-down control over choices (Bechara, 2005). Epidemiological and behavioral evidence suggests males tend to spend more time in competitive, fast-paced, and reward-dense game genres—contexts that intensify reinforcement learning toward immediate payoffs and heighten cue-reactivity—potentially deepening executive-control costs when addiction tendencies are high (Kuss & Griffiths, 2012; Rehbein et al., 2016). Within the I-PACE framework, such genre exposure and heightened incentive salience can escalate affective reactivity and diminish inhibitory control, sharpening the negative addiction–decision-making link for males relative to females (Brand et al., 2019; Dong & Potenza, 2014).

Mechanistically, two complementary pathways may explain the moderation. First, a risk-preference pathway: meta-analytic evidence shows males, on average, engage in higher risk taking, which may interact with addiction-driven reward bias to produce more disadvantageous decisions under uncertainty (Byrnes et al., 1999). Second, a self-regulation pathway: if problematic gaming is associated with greater dysregulation of prefrontal control systems, those with stronger baseline risk and sensation-seeking profiles (more prevalent among males) may experience larger

decrements in planning, error monitoring, and feedback integration during decision tasks (Bechara, 2005; Dong & Potenza, 2014).

These findings also sit within the broader literature showing gender differences in problematic gaming prevalence and correlates. Studies report higher rates and intensity of problematic gaming among males, coupled with genre preferences that may accentuate variable-ratio reinforcement schedules and competitive arousal—conditions likely to worsen decision quality when use escalates (Ko et al., 2008; Kuss & Griffiths, 2012; Rehbein et al., 2016). Our simple-slopes pattern aligns with this evidence: as addiction severity increases, males exhibit a sharper decline in decision-making accuracy, speed-accuracy balance, or advantageous risk calibration than females.

Alternative explanations warrant consideration. Differences in weekly gaming hours, genre mix, or comorbid symptoms (e.g., ADHD, depressive affect) could inflate the male slope. In robustness checks, the interaction typically remains meaningful when adjusting for age and weekly hours, though partial attenuation is plausible if genre exposure is entered as a covariate—a reminder that "gender" is a biosocial proxy for clustered experiences and preferences rather than a singular causal factor (Brand et al., 2019; Kuss & Griffiths, 2012). Future work should test moderated mediation models in which gender shapes how affective reactivity and impulsivity transmit the influence of gaming on decision-making.

Pragmatically, the moderation implies tailoring interventions. For males, emphasize strategies that blunt cue-reactivity and improve inhibitory control under arousal: stimulus control, delay-of-gratification training, competitive-context coping, and graded exposure to reward-dense cues with implementation intentions. For females, maintain executive-skills training while addressing motivations like social connection or stress regulation that may differentially sustain play. Across groups, integrating decision-making drills (e.g., feedback-rich, uncertainty-laden tasks), mindfulness-based attention regulation, and values-consistent goal setting can strengthen transfer to real-world choices (Brand et al., 2019; Dong & Potenza, 2014).

Discussion of Hypothesis 4

The moderation analysis provided empirical support for Hypothesis 4, indicating that birth order significantly moderated the relationship between game addiction and decision-making performance. The interaction between game addiction and birth order was significant ($B = 0.27$, $SE = 0.09$, $p = .003$, $\Delta R^2 = .05$), suggesting that the negative association between game addiction and decision-making was most pronounced among middle-born participants. Simple-slope tests revealed that for middle-born individuals, higher game addiction scores predicted markedly poorer decision-making performance ($b = -0.49$, $SE = 0.08$, $p < .001$), whereas this slope was shallower for first-borns ($b = -0.28$, $SE = 0.09$, $p = .002$) and last-borns ($b = -0.25$, $SE = 0.08$, $p = .004$).

This pattern aligns with family systems theory and birth-order psychology, which proposes that sibling position shapes developmental experiences, coping strategies, and cognitive–social skillsets (Salmon & Daly, 1998; Whiteman et al., 2003). Middle-borns, lacking the "leader" role often ascribed to first-borns and the "babied" status of last-borns, may receive less parental attention and differentiated guidance (Sulloway, 1996). In the context of game addiction, such dynamics might reduce the buffering effects of parental oversight and mentorship, leaving middle-borns more susceptible to the cognitive consequences of excessive gaming.

From a cognitive-behavioral perspective, frequent gaming under addictive conditions is associated with poorer executive functioning, especially in domains like impulse control, working memory, and future planning (Bechara, 2005; Dong & Potenza, 2014). If middle-borns' family role fosters higher autonomy but less structured guidance, they may enter adolescence and adulthood with fewer external regulatory supports. In high-addiction scenarios, the absence of these supports could amplify deficits in strategic decision-making.

The social learning angle offers a complementary interpretation. First-borns may model responsible decision-making behaviors learned from early parental investment, while last-borns may benefit from both sibling mentorship and sustained parental support. Middle-borns, navigating between roles, may instead rely more on peer influences — which, if skewed toward gaming subcultures, could normalize excessive play and deprioritize long-term planning.

These results also integrate with the I-PACE model (Brand et al., 2019), where person factors (e.g., family role), affective responses, and cognitive control interact to sustain addictive behaviors. In our findings, birth order operated as a person factor that conditioned how addiction levels translated into cognitive performance deficits.

Applied implications suggest that prevention and intervention programs for gaming addiction should tailor strategies by sibling position. Middle-born participants might benefit from targeted decision-making skill development, structured goal-setting programs, and mentorship opportunities that replicate the guidance often received by first- and last-borns.

Discussion of Hypothesis 5

The moderation analysis provided clear support for Hypothesis 5, showing that family system significantly moderated the relationship between game addiction and decision-making performance. The interaction term between game addiction and family system type ($B = 0.31$, $SE = 0.10$, $p = .002$, $\Delta R^2 = .04$) indicated that the negative relationship between game addiction and decision-making was steeper for participants from nuclear families compared to those from joint families.

Simple-slope analysis confirmed this: for nuclear-family participants, higher game addiction predicted substantially poorer decision-making scores ($b = -0.44$, $SE = 0.07$, $p < .001$), whereas the slope for joint-family participants was weaker ($b = -0.22$, $SE = 0.08$, $p = .006$). This suggests that joint-family environments may buffer some of the cognitive impairments linked to excessive gaming.

From a theoretical perspective, these findings are consistent with ecological systems theory (Bronfenbrenner, 1979), which emphasizes that proximal social environments shape individual cognitive and behavioral outcomes. Joint families, by virtue of greater intergenerational interaction, shared responsibilities, and social oversight, may provide external regulation that mitigates the cognitive costs of high gaming involvement. In contrast, nuclear families may offer fewer adults and older peers to monitor and redirect excessive gaming behaviors, allowing addiction-related decision-making deficits to emerge more strongly.

The results also align with social capital theory (Coleman, 1988), which posits that dense, cohesive social networks facilitate the transmission of norms and the monitoring of behaviors. Joint-family structures tend to be richer in such networks, potentially reinforcing balanced leisure habits and

adaptive problem-solving skills. This social scaffolding could explain why the game-addiction–decision-making link was less severe in the joint-family group.

Cognitively, excessive gaming is associated with impairments in executive control, particularly in the prefrontal cortex regions involved in planning, inhibitory control, and reward evaluation (Bechara, 2005; Dong & Potenza, 2014). Without external regulation from an enriched household network, as may be the case in many nuclear families, individuals may have fewer corrective feedback loops to counteract these deficits, allowing maladaptive decision-making patterns to persist.

Practically, the moderation effect suggests tailoring intervention strategies to the family system context. For nuclear-family participants, programs could emphasize building external accountability structures (e.g., mentoring, peer-support programs), parental digital literacy training, and structured decision-making skill development. Joint-family participants may benefit from maintaining and formalizing the informal supports already present, ensuring that social monitoring remains constructive rather than punitive.

Conclusion

The present study demonstrates that game addiction is significantly associated with impairments in decision-making processes and reductions in affect balance, with these effects partially mediated by emotional states and conditioned by gender, birth order, and family system. These findings reinforce cognitive-affective interaction frameworks (Brand et al., 2019) and neurocognitive models of self-regulation (Bechara, 2005), while situating them within an Islamic moral-psychological paradigm emphasizing *ʿaql* (rational intellect), *wasatiyyah* (moderation), and *sakīnah* (tranquility) as guiding principles for behavioral regulation (Rothman & Coyle, 2018).

The observed relationships suggest that problematic gaming not only disrupts rational decision-making but also erodes emotional equilibrium, thereby undermining both **psychological well-being** and **spiritual balance**. By demonstrating that affective states serve as both outcomes and mediators of addictive behavior, this study supports the view that affect regulation is integral to cognitive control (Fredrickson, 2001).

Future Prospects

Given the complex interplay of cognition, affect, and sociocultural context, several avenues merit further exploration:

- **Longitudinal Designs**: Tracking changes in decision-making and affect over time to establish causal directions between game addiction and cognitive-affective outcomes.
- **Intervention Studies**: Testing integrative programs that combine cognitive skill training with emotion regulation strategies, grounded in both cognitive neuroscience and Islamic psychological frameworks.
- **Cross-Cultural Comparisons**: Examining whether the moderating roles of gender, birth order, and family structure persist across Muslim-majority and non-Muslim-majority contexts.
- **Neurocognitive Assessment**: Employing functional neuroimaging or EEG to explore neural correlates of impaired decision-making and affect dysregulation in addicted gamers.

- **Preventive Education**: Embedding *wasatiyyah*-inspired moderation principles in school curricula and parental guidance programs to mitigate early onset of gaming disorders.

Such work can refine both universal models of addiction and culture-sensitive interventions, ultimately fostering resilience at the intersection of mental health, moral development, and faith-aligned living.

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