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**Abstract:** *The present study aimed to assess the effect of executive functioning on positive youth development. And to find the mediating role of family dynamic between executive functioning and drug use among university students. The sample (n=370) with age range 18 to 29 years (M=21.94, SD=2.07) was drawn through simple random technique from different universities of Peshawar, KP. Participants were screened using Drug Abuse Screening (DAST-10). Executive functioning was measured according to selected domains of BRIEF-A (inhibit, shift, emotional control and self-monitoring). Family dynamic was assessed through SCORE-15 and Positive youth Development was measured through multidimensional scale of Positive youth Development. Different statistical analysis such as Descriptive statistics, Simple Linear Regression and Mediation analysis were used. Result of Pearson correlation coefficient indicated that DAST has significant negative correlation with Positive youth Development ( $r=-0.14$ ,  $p<.05$ ) while significant Positive relationship with impaired executive functioning ( $r=.25$ ,  $p<.01$ ) and impaired family dynamic. Moreover, in Simple Linear Regression impaired executive functioning is significant negative predictor of Positive youth Development. In Mediation analysis indirect analysis impaired executive functioning is significantly negatively predict Positive youth Development. While in indirect path impaired poor family dynamics significantly but negatively mediate the relationship between impaired executive functioning and Positive Youth Development. Poor family functioning was itself strong predictor of impaired executive function ( $\beta=-.09$ ,  $p<.01$ ), indicating that students with higher drug abuse tend to come from more dysfunctional families, which in turn to poor executive functioning and disturbed positive youth development. It is suggested that strength-based therapies are conventional and effective Therapeutic plan to use with universities student to maximize their potential and enhance their positive relationship with their families.*

**Introduction**

Substance use in adolescents and emerging adults have become a high profile worldwide public health problem with far reaching developmental, social and economic consequences (United Nations Office on Drugs and Crime [UNODC], 2021; World Health Organization [WHO], 2022). Adolescence and emerging

adulthood are important transitions of life during which maturation in the biological, cognitive, and psychosocial domains takes place at an accelerated pace. These converging processes of development increase risk taking behavior such as experimentation with alcohol, tobacco and other psychoactive substances (Arnett et al., 2019; Squeglia & Cservenka, 2022). Neurodevelopmental research points to this higher vulnerability as being due in part by the fact that the prefrontal cortex is still maturing, which gives rise to the executive functions, including self-regulation, decision-making, and emotional control (Casey et al., 2019; Cohen Gilbert et al., 2025).

#### **University Students Substance use in Pakistan**

Although substance use among youth in young people has been extensively examined in the West, it is becoming an increasing concern in low and middle-income countries. In South Asia such as Pakistan, substance use in adolescents/young adults is closely associated with socioeconomic stressors, stress from schoolwork, unemployment, dysfunctional family, and poor access to mental health and recreational resources amongst adolescents (Degenhardt et al., 2019; UNODC & Anti-Narcotics Force [ANF], 2022). Regional studies have been carried out in Khyber Pakhtunkhwa area and it is narrated by their students that they experiment with drugs like alcohol, cannabis and prescription drugs. These behaviors are often ascribed to peer pressure, academic stress and the lack of a proper psychosocial support structures (Shujaat et al., 2022; Imtiaz et al., 2024; Rizwan et al., 2021). The present study focused on different psychological and social factors affected by drug use. The most important factor is family dynamics.

In this context of development and social and cultural context, family dynamics are a vital part of the environment in which the youth behavior and psychological adjustment of youth combines. Family dynamics are liked as the repetitive pattern of communication, emotional exchange, solving problem and behaviors within the context of the family system (Cui & Li, 2023). Family systems may be broadly conceptualized as functional or dysfunctional, based upon the quality of interpersonal interactions and emotional climate that is dominant.

Functional family dynamics is one where there is cohesion, adaptability, emotional help, and good communication in order to create emotional stability and development of self-regulation among the adolescent and budding adult (Fosco & Lydon-Staley, 2020; Dou et al., 2021). By contrast, dysfunctional family dynamics are marked by chronic conflict, emotional neglect, lack of clear and consistent roles and ineffective problem-solving skills, which have been repeatedly linked to emotional dysregulation, impulsivity and substance use (Chen et al., 2024; Singh, 2023). A study conducted by Mastrotheodoros et al. (2019) found that low levels of risky behavior, including substance experimentation, were present among adolescents who experienced open, responsive communication with parents. On the other hand, the family can be described by emotional avoidance, being criticized, or inconsistent dialogue, which were associated with emotional suppression and increased impulsiveness (Raposo & Francisco, 2022). In the Pakistani context, Saleem and Masood (2024) underscored the cultural norms reinforcing the hierarchical roles within a family; thus, it may restrict people's feelings of disclosing; therefore, positive communication plays an important role to moderate risk behavior in university students.

Executive functioning (EF) refers to high-level cognitive processes that enable people to control their behavior, to adapt behaviors to new situations, to regulate their emotions and to become aware of their own actions (Best & Miller, 2020). In the current study, EF is measured based on the subscales of BRIEF-A: Inhibit, Shift, Emotional Control, and Self-Monitoring, which are indicative of fundamental aspects of self-regulation and cognitive flexibility that are applicable to real-world functioning. EF continues to develop through adolescence and emerging adulthood, so students in the university setting are

especially sensitive to environmental stressors, peer influence and family relationships (Zelazo, 2023; Luna et al., 2024).

Inhibitory control has been shown to strongly be associated with risk of substance use. Cope et al. (2020) carried out the longitudinal study involving adolescents between the ages of 12-18 and found that greater weaknesses in inhibitory control were a predictor of earlier initiation and frequency of alcohol, cannabis, and tobacco use. Another study done on Self-monitoring deficits are also a part of vulnerability to substance use. Gonzalez et al. (2023) looked at EF ratings including self-monitoring in early adolescence and tracked the participants into adulthood. Cognitive flexibility (Shift) allows individuals to shift their thinking and behavior in connection to changing circumstances. Kaar et al (2024) looked at day to day variations and cognitive flexibility and inhibitory control and found that adolescents with less flexibility were more likely to engage in impulsive behaviors including experimentation with substances.

### **Another aspect of the study was positive youth development**

The Positive Youth Development (PYD) framework offers a strengths-based perspective on the development of adolescents and emerging adults that is focused on the process of developing competencies and resources rather than a focus on reducing risks (Lerner et al, 2021). Central to this framework are the "Five Cs" that are competence, confidence, connection, character and caring that make up optimal psychosocial functioning. Research consistently shows that the degree of PYD competencies is related to decreased substance use, improved emotional regulation and improved interpersonal relationships for adolescents and emerging adults. A core concept of PYD is Competence, including cognitive, social and academic competence, has been found to buffer against risk-taking behaviors. Competence is linked with higher cognitive ability previous study conducted on university students showed that higher level of competence is associated with lower drug use behavior (Gómez-Baya et al., 2025).

Accordingly, the present study aims at examining the impact of executive functioning on Positive Youth Development among the substance using University students of Khyber Pakhtunkhwa, Pakistan while investigating the family dynamics in the same context. By addressing this gap, the study aims to provide culturally based evidence to inform prevention and intervention strategy in enhancing cognitive, emotional and social competencies in at risk youth.

### **Rationale of study**

Substance use among university students in Pakistan has become an increasing issue and has impacted not only academic performance, but psychological health and social functioning as well. For example, Ahmed, Yousaf, Saud and Ahmad (2020) documented the alarming increase in the addiction of drugs among students in higher education institutions and its adverse effect on their daily actions and socialization. However, much of the existing research created on substance use in Pakistan has focused on isolated risk factors such as peer influence and academic stress with comparatively few studies addressing the interaction between family dynamics and executive functioning on developmental outcomes in substance using youth. This gap is significant because the theoretical and empirical evidence shows that family relationships are central to the development of behavior in collectivist cultures such as the Pakistani culture where family support system and norms are important factors that impact values, coping mechanisms and health behavior (Shahzadi et al., 2024). Meanwhile, in other contexts research shows that problematic social media use - a pervasive aspect of digital engagement amongst young adults, is related to emotional disturbance, as well as poorer executive functioning, including an impaired sense of self control and decision making (Zhang et al., 2023). Poor executive

functioning is one of the major cognitive vulnerabilities that may interfere with protective capacities against risky behaviors like substance use. At the same time, excessive engagement on the Internet has been associated with diminished quality of family communication and emotional connection, and may have weakening effects on the protective influence of supportive family environments and leave students vulnerable to maladaptive behaviors. Although the literature from developmental and public health perspectives recognizes both strong family support and high executive functioning as a protective factor against substance use (Avci, 2025), little information exists about how these factors work in conjunction among substance using university students in Pakistan, especially as digitalization and social media engagement results in. Therefore, the present study aims to address this gap by exploring the effectiveness of family dynamics and EF together in the development of Positive Youth Development (PYD) among substance users in universities in Khyber Pakhtunkhwa with the hope of drawing in-house insights that can be used in designing and providing evidence based interventions in order to strengthen family communication, improve EF and positive digital media use to promote healthy youth outcomes.

### **Objectives**

- 1) To evaluate the relationship among positive youth development, executive functioning, and family dynamic in individuals with substance use.
- 2) To evaluate the role of executive functioning on positive youth development in individual with substance use.
- 3) To evaluate the mediating effect of family dynamics on the relationship between executive functioning and positive youth development in individuals with substance use.

### **Hypotheses**

- 1) There will be significant association among youth development, executive functioning and family dynamic among individual with substance use
- 2) Impaired executive functioning will predict negatively positive youth development in individual with substance use.
- 3) Family dynamics will mediate the relationship between executive functioning and positive youth development on individual with substance use.

### **Methodology**

#### **Sample**

The target population was comprised of students pursuing BS and M.Phil. Programs at higher education institutions based in Peshawar. Information about the total number of enrolled students in each of the four selected universities was obtained from the concerned admission offices. Based on these official records, the approximate total population of BS and M. Phil students in various selected institutions was found to be 10452.

#### **Sample Size and Sampling Method**

Using the Krejcie and Morgan (1970) sample size determination procedure, a sample size of 370 participants was considered as sufficient to represent the population at the 95% confidence level with a margin of error of 5%. Accordingly, a sample of 370 students was selected using a SR (simple random) method in which each student of the population had the same chance of picking.

#### **Research Instruments**

##### **Demographic Information Sheet**

A self-developed demographic information sheet was used to get background facts of the participants such as age, gender, level of education, marital status, family structure and socioeconomic status (SES). SES was measured with Modified Kuppaswamy Socioeconomic Status Scale, which contains 3 indicators

measuring the socioeconomic status: education of head of household, occupation of head of household and monthly family income. These indicators are combined to classify the participants into five socioeconomic categories: upper, upper middle, middle, lower middle and lower class. The Modified Kuppaswamy Scale is popular in South Asian and low- and middle-income countries because it offers a culturally relevant composite estimate of socioeconomic position reflecting both social and economic features of family background (Saleem, 2019; Wani, 2019). Demographic and SES data were used to describe sample characteristics for study variables and provide contextual interpretation of study variables.

#### ***Drug Abuse Screening Test-10 (DAST-10)***

Substance use was screened with the Drug Abuse Screening Test--10 (DAST--10) created by Skinner (1982). The DAST-10 is a short self-report measure that was written to identify problematic involvement with psychoactive substances other than alcohol and tobacco. It is a set of 10 dichotomous items, with total scores ranging from 0 to 10, with the higher the total score, the greater the severity of drug-related problems. The cutoff score in the current study was 3 and higher to identify substance users. The DAST-10 has shown good psychometric properties with Cronbach's alpha coefficients ranging from .86-.92 across a range of different populations.

#### ***Systemic Clinical Outcome Routine Evaluation-15 (SCORE-15)***

Family dynamics were measured by using Systemic Clinical Outcome and Routine Evaluation-15 (SCORE-15) by Stratton et al. (2010). The instrument consists of 15 items overall which are rated on a 5-point Likert scale and measure family functioning in various domains of strengths, communication and difficulties. In fact, higher scores indicate higher family dysfunction while lower scores indicate healthier and more adaptive family functioning. The SCORE-15 has also shown acceptable reliability and validity with a reported Cronbach's alpha of .89 showing its adequacy for family systems research.

#### ***Behavioral Rating Inventory of Executive Function- Adult Version (BRIEF - A)***

Executive functioning was assessed by the Behavioral Rating Inventory of Executive Function-Adult Version or BRIEF-A as developed by Gioia et al. (2000). The BRIEF-A involves a 3-point Likert-type response scale from Never (1) to Often (3) and measures the executive functioning in everyday situations. The present study will use only the Behavioral Regulation Index (BRI). The BRI includes 30 items that measure inhibition, shifting, emotional control and self-monitoring. The higher the scores, the more impaired the person's executive functioning is. The BRI has shown good internal consistency with a reported Cronbach's alpha measure of .94.

#### ***Positive Youth Development (PYD) Scale***

Positive Youth Development was assessed with the Positive Youth Development (PYD) Scale developed by Lerner et al. (2021). The scale is made up of 55 items on a 5-point Likert scale and measures five main areas: competence, confidence, character, connection and caring. Higher scores represent greater positive attributes in development. The PYD scale has been shown to have strong reliability and validity across cultural contexts with values ranging from .78 to .91 reported for Cronbach's alpha coefficients for the subscales.

#### ***Procedure***

Following departmental research committee formal approval, data collection was begun in accordance with ethical guidelines for psychological research. Before contacting the participants, official data of enrollment numbers of BS and M. Phil students were collected from each of the selected universities at their admission offices. Formal permission to carry out the study was then sought and obtained from the concerned university authorities.

After institutional approvals participants were selected from the Universities located in Khyber Pakhtunkhwa using a simple random sampling procedure. A total of 370 BS & M. Phil students were approached. Students who met the eligibility criteria (enrolled to BS or M.Phil. programs and those falling in the age range specified for youth) were contacted in classrooms, hostels, and common areas within the universities. Briefed on the purpose of the study beforehand, written informed consent was obtained before students could take part. Participants were told that participation was voluntary, their answers would be kept confidential and they could drop out at any time without punishment.

Data were obtained using a questionnaire booklet in which all study instruments were posed. The survey participants were given clear instructions, and encouraged to seek clarification when necessary to ensure that responses were accurate and honest. As part of the same data collection process, participants had been screened for the presence of substance use using the DAST-10. Those who scored 3 or above were considered substance users and were retained for further analysis. Based on this screening, 185 participants met the cutoff criteria and were retained while the remaining 185 participants that did not meet the cutoff were excluded from further analyses in congruence with the objectives of the study.

Following screening, responses on the SCORE-15, BRIEF-A and PYD Scale were reviewed. Completed questionnaires were checked for missing data, inconsistencies in responses, and patterned answering. Valid responses were coded and transferred to the Statistical Package for the Social Sciences (SPSS) for analysis.

#### **Data Analysis Plan**

Inferential analyses were carried out according to the objectives and hypotheses of the study. Descriptive statistics (means, standard deviations, frequencies and percentages) were calculated and used to summarize demographic characteristics and important study variables. Reliability analyses were conducted in order to assess the internal consistency of all scales.

Pearson product-moment correlation was performed to analyze the bivariate relationships of executive functioning, family dynamics, and Positive Youth Development. To determine the predictive value of executive functioning on PYD, hierarchical multiple regression analyses were conducted. Entrance criteria to the study were executive functioning as the predictor, followed by the family dynamic as the next priority to understand changes in explained variance. In addition, mediation analysis was performed to test the mediating role played by family dynamics to the relationship between executive functioning and PYD in substance users using standard regression-based mediation procedures. All analyses were undertaken using statistical software package (SPSS) and interpreted at an appropriate level of statistical significance

#### **Results**

**Table 1**

*Sociodemographic Characteristics of the Participants at Baseline (N=185)*

Baseline Characteristics	N	%
Age		
18-20	45	24.3
21-23	101	54.6
24-26	37	20.0
27-29	2	1.1
Gender		
Male	157	84.9

Baseline Characteristics	N	%
Female	28	15.1
Socioeconomic Status		
Upper	59	31.9
Upper Middle	83	44.9
Lower Middle	24	13.0
Upper Lower	16	8.6
Lower	3	1.6
Education		
Intermediate	33	17.8
Bachelors	143	77.3
Masters or Above	8	4.3
Family System		
Nuclear	77	41.6
Joint	108	58.37
Birth Order		
Eldest	61	33.0
Middle	69	37.3
Youngest	48	25.9
Only	7	3.8
Residence		
Urban	90	48.6
Rural	95	51.3

Note. n=frequency, %= percentage

Table 1 describes the percentage and frequency of the demographic variables of the study. The results highlighted that the participants belonged to age range of 18 to 29 with more male participants. Majority of participants belong to upper middle status with joint family systems.

**Table 2**

*Psychometric Properties for BRIEF-A, SCORE 15 and PYD Scales (N=185)*

Scales	M	SD	Range	Cronbach $\alpha$
BRIEF-A	30.07	8.36	11-55	.74
SCORE 15	2.94	0.24	1-3	.63
PYD	135.96	22.42	63-221	.86

Note. BRIEF-A= Behavior Rating Inventory for Executive Functioning, SCORE 15= Systematic Clinical Outcome and Routine Evaluation-15, PYD= Positive Youth Developmentally

**Table 3***Descriptive Statistics and Correlation for DAST-10, BRIEF, PYD and SCORE-15(N=185)*

Variables	n	M	SD	1	2	3	4
DAST-10	185	4.41	1.62	1			
BRIEF-A	185	30.07	8.3	0.258**	1		
PYD	185	135.96	22.4	-0.140	-0.039*	1	
SCORE-15	185	2.94	0.24	0.001	0.038	-0.139*	1

Note. DAST= Drug Abuse Screening Test, BRIEF-A= Behavior Rating Inventory for Executive Function, PYD= Positive Youth Development, SCORE= Systematic Clinical Outcome for Routine Evaluation, EF= Executive Function

p<.05, p<.01

A Pearson correlation coefficient was calculated to determine the linear relationship among substance use (DAST 10), EF (BRIEF A), PYD and Family dynamics (SCORE 15). The table revealed a significant positive relationship between substance use (DAST-10) and executive functioning difficulties (BRIEF-A) ( $r = .258, p < .01$ ). Substance use was negatively correlated with PYD ( $r = -.140, p < .05$ ), while its association with family dynamics (SCORE-15) was non-significant ( $r = -.140, p > .05$ ). Executive functioning difficulties (BRIEF-A) showed a negative relationship with PYD ( $r = -.039, p < .05$ ) and a positive association with family dynamics (SCORE-15) ( $r = .038, p < .05$ ). PYD was also negatively correlated with family dynamics (SCORE-15) ( $r = -.139, p < .05$ ).

**Table 4***Regression Coefficient of Executive Function on Competence (PYD)(N=185)*

Variable	B	B	SE
Constant	36.46***		2.1
BRIEF-A	-0.016*	-.017	.06
R <sup>2</sup>	.017		

Note. Constant= competence, BRIEF-A= Behavior Rating Inventory of Executive Function-Adult, SE= standard error

p<.001, p<.05

Table 4 shows the impact of executive function (BRIEF-A) on the subscale "competence" of PYD among individuals with substance use. The R<sup>2</sup> value of .017 reveal that predictor variable explained 1% variance in the outcome variable with  $F(1, 182) = 0.053, p < .05$ . The findings reveal that executive function is the negative predictor of PYD (competence)  $B = -.017, p < .05$

**Table 5***Regression Coefficient of Executive Function on Character (PYD)(N=185)*

Variable	B	B	SE
Constant	22.08***		1.45
BRIEF-A	-.025*	-.040	.047
R <sup>2</sup>	.04		

Note. Constant= Character, BRIEF-A= Behavior Rating Inventory of Executive Function-Adult, SE= Standard Error

$p < .001$ ,  $p < .05$

Table 5 shows the impact of executive function (BRIEF-A) on the subscale "Character" of PYD among substance users. The  $R^2$  value of .04 reveals that predictor variable explained 4% variance in the outcome variable with  $F(1, 181) = 0.286$ ,  $p < .05$ . The findings reveal that executive function is negative predictor of PYD (character)  $B = -.040$ ,  $p < .05$

**Table 6**

*Regression Coefficient of Executive Function on Connection (PYD)(N=185)*

Variable	B	B	SE
Constant	20.36***		1.27
BRIEF-A	-.04**	-.079	0.041
$R^2$	0.079		

Note. Constant= connection, BRIEF-A= Behavior Rating Inventory of Executive Function-Adult, SE= standard error, PYD= positive youth development

Table 6 shows that the impact of executive function (BRIEF-A) on the subscale "connection" of PYD among individuals with substance use. The  $R^2$  value of .079 reveals that predictor variable explained 8% variance in the outcome variable with  $F(1, 182) = 1.13$ ,  $p < .05$ . The findings reveal that executive function is negative predictor of PYD (connection)  $B = -.079$ ,  $p < .05$

**Table 7**

*Regression Coefficient of Executive Function on Caring (PYD)(N=185)*

Variable	B	B	SE
Constant	19.46***		1.35
BRIEF-A	-.025*	-.044	.044
$R^2$	.044		

Note. Constant= caring, BRIEF-A= Behavior Rating Inventory of Executive Function, SE= standard error, PYD= positive youth development

Table 7 indicates the effect of executive function (BRIEF-A) on the subscale "caring" of PYD for substance users. The  $R^2$  value of 0.044 found that the predictor variable explains 4% variance in the outcome variable with  $F(1, 180) = 0.341$ ,  $p < .05$ . The findings reveal that executive function is negative predictor of PYD (caring)  $B = -.044$ ,  $p < .05$ .

**Table 8**

*Regression Coefficient of Executive Function on Confidence (PYD)(N=185)*

Variable	B	B	SE
Constant	24.28***		1.76
BRIEF-A	-.071**	-.093	.057
$R^2$	.093		

Note. Constant= confidence, BRIEF-A= Behavior Rating Inventory of Executive Function-Adult, SE= standard error, PYD= positive youth development

$p < .001$ ,  $p < .01$

Table 8 reflects the effect of executive function as measured by the subscale "confidence" of PYD for those who have a substance use. The R<sup>2</sup> value of .93 shows that predictor variable actually explained 9% of variance in the outcome variable,  $F(1, 181) = 1.56$ ,  $P < .05$ . The results show that executive function was a negative predictor of PYD (confidence)  $B = -.093$ ,  $p < .05$ .

**Table 9**

*Regression Analysis for Mediation of Family Functioning Between Executive Function and Positive Youth Development (PYD)*

(N=185)

Variable	B	95% CI	SE	$\beta$	R <sup>2</sup>	$\Delta R^2$
Step 1					.02	.02
Constant	139.10***	126.77_ 151.44	6.25			
BRIEF-A	-.105	-.501_ -.291	.201	-.039		
Step 2					.02	.01
Constant	175.01***	135.06_ 214.96	20.24			
BRIEF-A	-.092**	-.458_ -.302	.200	-.034		
SCORE-15	-12.33**	-25.39_ -.72	6.6	-1.38		

Note. Constant= positive youth development (PYD), BRIEF-A= Behavior Rating Inventory of Executive Function-Adult, SCORE= Systematic Clinical Outcome and Routine Evaluation

$p < .001$ ,  $p < .01$

Table 9 demonstrates the effect of executive function (BRIEF-A) and disrupted family functioning (SCORE-15) and it suggested an effect on PYD in those with substance use. In step 1 the R<sup>2</sup> value of .02 reveal that 2% variance in PYD with  $F(1, 179) = .274$  and  $p < 0.01$ . The finding shows that impaired executive function is a negative predictor of PYD ( $\beta = -.039$ ,  $p < 0.01$ ). In step 2 R<sup>2</sup> value of .02 reveal that executive function and disrupted family functioning brings variance in PYD with  $F(2, 178) = 1.87$ ,  $p < 0.001$ , the finding reveals that executive function ( $B = .034$ ,  $p < 0.01$ ) and disrupted family function ( $B = -1.38$ ,  $p < 0.01$ ) negatively predicted PYD. The result of the  $\Delta R^2$  value of .01 reveal 1% change in variance of model 1 model 2 with a  $F(2, 178) = 3.47$ ,  $p < .001$ . The regression weight for executive function reduced from model 1 to model 2 (-.10 to -.09) but are still significant which confirmed the partial mediation more specifically, executive function has direct as well as indirect effect on PYD.

### Discussion

The current study examined the role of executive functioning and family dynamics in Positive Youth Development (PYD) among substance-user university students in Khyber Pakhtunkhwa Pakistan. Overall, the results indicated that higher executive functioning problems were found to have a significant association with lower levels of PYD in core domains and that family dynamics emerged as a meaningful mediating mechanism of this association. These findings are consistent with developmental systems perspectives that suggest that the final outcomes on youth are best understood in terms of the interaction between individual regulatory capacities and relational contexts rather than in terms of standing isolated predictors of youth outcomes.

An important issue for interpreting the results relates to the nature of substance use in the sample. Participants were recruited from university settings as opposed to clinical or rehabilitation services and this suggests that most respondents were occasional or non-dependent users as opposed to individuals experiencing severe substance use disorders. This distinction is important due to the general observation that clinical populations generally show stronger impairment with respect to psychosocial functioning, cognitive performance and family relationships versus community-based samples of emerging adults (Degenhardt et al., 2019; Weiss et al., 2023). Accordingly, the non-clinical composition of the sample provides a plausible explanation for the smaller effect sizes in the outcomes for EF, family dynamics and PYD. Unlike treatment-seeking samples, most participants in the present study seemed to maintain functional involvement in academic activities, in social activities, and in continuing to be part of a family, and that may dilute the size of observed associations.

The demographic profile of the sample is another context. Big majority of the participants were in the age range of 21-23, which is the period of emerging adulthood. This stage is characterized by improved autonomy and identity exploration and the exposure to risk behaviors, including substance usages (Woodward et al., 2023)

This age pattern is stable with previous studies reporting that substance use tends to peak during early adulthood as self-regulatory systems are still under consolidation while the sensation-seeking tendencies are elevated (Squeglia & Cservenka, 2022). Weiss et al. (2023) similarly reported higher substance misuse levels among young adults in this age group than in older adults, supporting the finding that emerging adulthood is a critical period to get exposed to and intervene on use. In terms of gender male showed higher ratio of drug use the most probable reason for higher use of drug in male is social mobility, heightened peer influence, and restrictions within the Pakistani culture on women's social exposure (Rizwan et al., 2021; Imtiaz et al., 2024). In terms of socioeconomic, majority of the participants were upper middle socioeconomic and were enrolled in higher education programs. Students from relatively privileged backgrounds might experience performance-related stress, social expectations and increased access to substances and these can contribute to maladaptive coping, such as substance use.

Substance use severity was negatively related to PYD, especially in areas of competence, confidence and connection. This finding is in line with strengths-based literature that suggests ongoing risk engagement could compromise on development and expression of personal and social assets (Johnson & Ettekal, 2023). However, the association was relatively weak and this suggests that PYD is not simply the inverse of risk behavior. Rather, PYD represents a nurture of a broader developmental profile which may coexist with substance use in high functioning university populations. Lerner et al. (2022) likewise emphasized the fact that youth can have both developmental strengths and risk behaviors at the same time, especially when we are talking about the academic and social environments. Regression analyses were performed to determine whether executive functioning difficulties were predictive of PYD and domains in PYD. The findings indicated that executive functioning difficulties were a significant predictor of overall lower PYD, but predicted variance was small. This would seem to indicate that executive functioning is a meaningful contribution to strengths-based development but one aspect of a larger development system. Similar results are reported in literature, showing that executive functioning is associated with small but significant variance on positive developmental outcomes (particularly in emergent adulthood); particularly on emerging adulthood (Green et al., 2023; Johnson & Ettekal, 2023). Mediation analyses were performed to compare the possible existence of executive functioning and PYD, family dynamics as interacting mechanisms. The results showed that family dynamics mediated the

link between executive functioning and overall PYD to some extent. Executive functioning was significantly predictive even after the family dynamics and the indirect pathway of family functioning was also statistically significant. This pattern implies that executive functioning affects PYD through direct influences as well as through family system embedded relational pathways.

Overall, the findings from the mediation indicate the integrative nature of family dynamics in the link between individual cognitive regulation and functioning in a positive developmental trajectory. Executive functioning with all its aspects does not determine youth outcomes as much as its influence is shaped, supported and partly transmitted through relational contexts. These findings add empirical support to the conceptual model of the study, and the need for targeting Positive Youth Development and including family-based components of interventions in working with substance using university students.

### **Limitations**

1. Several limitations should be taken into account while interpreting the results of the present study. First, the use of a cross-sectional correlational design delimit infers association.
2. The sample composition limits the generalizability. Because participants were mainly men accepted in undergraduates because of the university settings used, these findings might not totally reflect female undergraduates and not really appropriate to non-student younger people or even to substance using that is largely destined in a typical community setting.

### **Recommendation**

1. Future research can enhance and build upon the current findings in a number of ways. To better elucidate developmental processes and enhance inference, future research should develop longitudinal structures in which to examine changes in executive functioning, family processes, and PYD over time and, when possible, to use experimental or quasi-experimental structures to test interventions that focus on these areas.
2. In addition, research should focus on more diverse and gender-balanced samples including participants drawn from a university and community setting.
3. From an applied standpoint, interventions targeting at-risk youth should be explicit attempts to strengthen foundational executive functioning skills and these skills in particular include emotional regulation, impulse control, planning, and goal-directed behavior.

### **Conclusion**

This study examined the effect of executive functioning on Positive Youth Development (PYD) or the mediating role of family dynamics on emerging adults who are substance users. The findings show that the degree of deficit in executive functioning is linked to lower PYD in all five core domains - competence, confidence, connection, character, and caring. Family functioning turned out to be a partial mediator, indicating that positive family contexts that are supportive and cohesive are able to strengthen the pathway from individual cognitive capacities to positive development. Ultimately, the current research highlights the importance of the idea of a holistic developmental perspective for understanding and improving youth outcomes. By understanding the role of executive functioning and family dynamics together in Positive Youth Development, it may be possible for stakeholders, such as educators, clinicians, and policymakers, to better support the development of competencies in young adults along with confidence and relationships that can help them navigate the challenges and succeed in many different domains of life.

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