

Peer Influence and the Psychological Pathways of Vaping Behavior in Young Adults

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ABSTRACT

The present research was conducted using a correlational research design to explore the association between peer pressure, sensation seeking, curiosity, and vaping among young adults, where curiosity played the role of a mediator. A purposive sample of 150 young adults aged 19–25 years was recruited from government and private colleges, universities, and vaping outlets in Lahore. Participants answered questions contained in a questionnaire booklet which comprised a demographics questionnaire, Parent and Peer Influence Scale, Brief Sensation Seeking Scale, Curiosity and Exploration Inventory-II, and Modified E-Cigarette Questionnaire. The results revealed a positive association between sensation seeking and peer influence on curiosity, especially embracing. Embracing curiosity significantly predicted stimulant effect, negative reinforcement, and positive reinforcement motives for vaping, while the stretching dimension showed negative associations with certain vaping outcomes. Mediation analyses revealed that embracing curiosity partially mediated the relationship between peer influence and vaping behaviors. Stress, included as a covariate, was primarily associated with aversion-related vaping motives. In conclusion, the research indicates that curiosity, particularly curiosity acceptance, has a significant impact on how social and personality traits influence vaping behavior. It is clear that efforts to prevent or treat vaping in young adults should consider motivations based on curiosity.

Keywords: Peer Influence, Sensation Seeking, Curiosity, Vaping Behavior, Young Adults

INTRODUCTION

Young adulthood is an important development period defined by experimentation, identity formation, and growing independence. It is often termed as emerging adulthood and is associated with greater openness to new experiences and a higher risk of indulging in risky behaviors including substance abuse

(Santrock, 2021). One particular form of such risky behavior that has been increasingly adopted by teenagers and young adults is the usage of electronic cigarettes also known as vaping. In vaping, aerosols of substances such as nicotine are inhaled using electronic devices and have been marketed as a healthier substitute to combustible cigarettes. Despite its reputation for being healthier, it has been proven to be a risky behavior for health (World Health Organization, 2024).

Worldwide, the e-cigarette industry surpassed USD 22 billion in 2022 and is continuously growing fast, especially among youths (Public Medical Central, 2023). In Pakistan, the act of vaping has gained popularity in the university and college environment and is practiced with a lack of knowledge about the addiction factor and health hazards of vaping. Urban studies have shown that vaping is done by the youth for curiosity reasons and then they move on to regular vaping practices. Such growing prevalence makes it imperative to understand the psychological processes involved in the initiation and persistence of vaping in this age group.

From many factors determining vaping, peer influence, sensation seeking, and curiosity stand out as highly significant ones at the age of young adulthood. Peer influence involves the process through which people tend to emulate what they observe from members of relevant social groups and is based on the theory of Social Learning developed by Bandura in 1977. This theory stipulates that people learn behavioral patterns through the process of observing and imitating others. At the age of young adulthood, people experience an increasing need for social approval, making them more vulnerable to peer influence. Research findings show that young adults surrounded by peers who vape find vaping acceptable and have higher chances of vaping too (Miech et al., 2023).

Meanwhile, sensation seeking refers to a stable personality characteristic defined by the need for new, exciting, and arousing experiences as well as tolerance of possible risk in order to achieve them (Zuckerman, 1979, 1994). The point here is that sensation seekers do not pursue risk for its own sake but accept it as an inevitable consequence of the need for stimulation. In other words, vaping can be appealing for sensation seekers because of its novelty and excitement associated with flavors, devices, and modern nature. Sensation seeking was associated with risky health behavior in previous studies, especially among adolescents and young adults.

Although social aspects and traits such as peer influence and sensation seeking explain why adolescents engage in vaping, they do not give the full picture of the psychological processes involved in how these elements become behaviors. The need for exploration of things that are new and unknown is a vital motivation factor that can fill this gap. In Berlyne's (1960) theory of curiosity-driven behavior, humans are driven to seek out novel and ambiguous stimuli to decrease uncertainty and satisfy their cognitive or sensory curiosity needs. Kashdan et al. (2009) identified two types of curiosity: the first one refers to the desire to gain new knowledge and grow intellectually and the second one – the willingness to embrace novelty and uncertainty. Embracing curiosity is especially pertinent to the phenomenon of vaping, because many young adults describe trying e-cigarettes "to see what it feels like."

Curiosity, however, is not a lone force. Curiosity regarding vaping can be generated due to peer exposure, whereas sensation seeking could heighten motivation towards vaping behavior. Those who exhibit sensation seeking could be more inclined to generate curiosity for those behaviors modeled by peers because of the excitement associated with vaping, as well as it being socially acceptable and novel. Evidence shows curiosity as the mediator between vaping cue exposure and intent to use (Margolis et al., 2018). Notwithstanding that there is ample evidence regarding individual predictors of vaping, there is little research focusing on social and personality predictors of vaping through a unifying psychological approach.

The present research seeks to fill this knowledge gap by incorporating curiosity as a mediating construct that helps explain the relationship between peer influence and sensation-seeking and vaping behaviors along several aspects such as stimulant effects, aversion, negative reinforcement, and positive reinforcement. Using Social Learning Theory together with a theory of behavior based on curiosity and traits, the paper provides a holistic explanation of young adult's engagement in vaping. Perceived stress is controlled as a variable that may affect substance use behaviors.

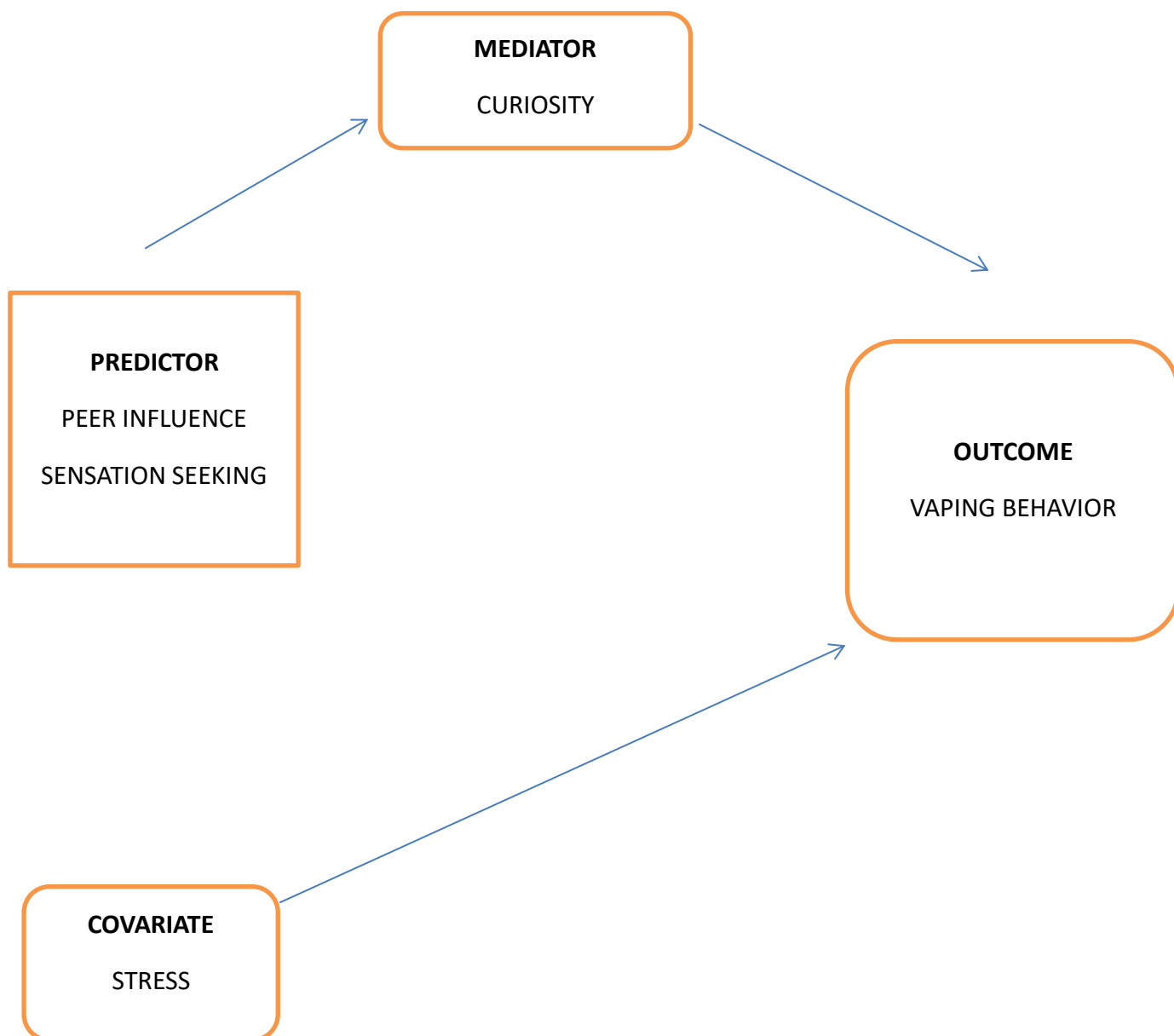
Significance of the Study

The research is significant not only from a theoretical perspective but also from a practical one. From a theoretical perspective, the research helps expand the existing theoretical frameworks for understanding vaping behavior in that it introduces the role of curiosity as an important mediating psychological factor linking peer influence and sensation seeking with vaping motivations. With the use of Social Learning Theory alongside the trait approach to sensation seeking and curiosity-driven approaches, the research contributes to a better and more elaborate understanding of vaping initiation and perpetuation.

Practically, the results have considerable importance for designing preventive measures. The fact that curiosity, which is intensified through sensation seeking, not only peer pressure is responsible for engaging in vaping implies that the interventions must target the aspect of dealing with curiosity-driven experimentation, novelty seeking, and misperceptions about vaping. The research is especially important in the Pakistani socio-cultural setting, where there is scarce empirical evidence on vaping practices despite their growing frequency among young people. The results could be utilized by public health agencies, universities, and mental health practitioners in working with young adults.

Hypotheses

1. Peer Influence, Sensation Seeking and Curiosity are likely to have a relationship with vaping behaviors (stimulant effect, aversion, negative reinforcement and positive reinforcement).
2. Peer Influence, Sensation Seeking and Curiosity are likely to predict the vaping behavior (stimulant effect, aversion, negative reinforcement and positive reinforcement).
3. Curiosity is likely to mediate the relationship between peer influence and vaping behaviors i.e., stimulant effect, aversion, negative reinforcement and positive reinforcement.
4. Curiosity is likely to mediate the relationship between sensation seeking and vaping behaviors i.e., stimulant effect, aversion, negative reinforcement and positive reinforcement



METHOD

Research Design

In present study, a correlational research design was utilized. Correlational research design is a type of nonexperimental research design that examines the degree and direction of relationships between variables without any manipulation (Shaughnessy et al., 2016).

Sampling Strategy

The study applied the use of purposive sampling where individuals who met predetermined inclusion criteria were selected for the study (Shaughnessy et al., 2016).

Participants

The intended population of this study was young adults aged between 19 and 25 years old (Santrock, 2021). In the end, 150 participants were involved in the sample. They were drawn from government and private colleges, universities, and vaping establishments. The average age of participants was 21.5 years ($SD = 1.74$). There were 66% males ($n = 99$) and 34% females ($n = 51$) in the sample.

Table 1

Demographic Characteristics of participants (N=150)

Variable	<i>M</i>	<i>SD</i>	<i>f</i>	%
Age	21.5	1.74		
Gender	Male		99	66
	Female		51	34
Education	Intermediate		24	16.0
	Bachelor		115	76.7
	Masters		11	7.3
Institute	Government		100	66.7
	Private		50	33.3
Family	Nuclear		100	66.7
System	Joint		50	33.3
General	Unsatisfactory		5	3.3
Home Environment	somewhat unsatisfactory		7	4.7
	Neutral		40	26.7
	somewhat satisfactory		22	14.7

	Satisfactory	76	50.7
Do you vape	Yes	98	65.3
Everyday			
	No	52	34.7

Measures

Parent and Peer Influence Scale (PPIS)

The PPIS (Parent and Peer Influence Scale) was used for measuring the level of peer influence on one's attitudes and behavior. The PPIS is a questionnaire that uses several statements, which have to be rated according to the Likert-type scale where high scores mean high levels of peer influence (Werner-Wilson & Arbel, 2014). The PPIS showed acceptable reliability in several studies that analyzed the impact of social factors on health-risk behaviors among adolescents and young people.

Brief Sensation Seeking Scale (BSSS)

Sensation-seeking behavior was measured through the Brief Sensation Seeking Scale (BSSS), which was created by Hoyle et al. (2002). This scale comprises 8 items that measure the need for stimulation, which involves engaging in novel, complicated, and exciting experiences. These responses were measured on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). A high score denotes a high level of sensation-seeking behavior.

Curiosity and Exploration Inventory–II (CEI-II)

Curiosity was assessed with the help of the Curiosity and Exploration Inventory –II (CEI-II) scale created by Kashdan et al. (2009). It is a 14-item self-report measure that consists of two scales: Stretching scale is used for assessment of the active process of seeking new information and experiences, and the Embracing scale stands for the willingness to explore uncertainty and novelty. Respondents rate each statement according to a 5-point Likert scale from 1 ("Strongly Disagree") to 5 ("Strongly Agree"). Higher values indicate a higher level of curiosity. Cronbach's alpha for this scale is very high – from .80 to .85.

Modified E-Cigarette Questionnaire (MECQ)

The modified E-cigarette questionnaire developed by Morean et al. (2015), the Modified E-Cigarette Questionnaire (MECQ), was used to examine the vaping behavior of participants. This measure includes measures of different factors regarding vaping behavior such as frequency and patterns of use, the amount of nicotine in e-cigarettes, motivations for using e-cigarettes, and vaping cue exposure. The MECQ has been found to have a high level of internal consistency with Cronbach's alpha values ranging from .70 to .85.

Perceived Stress Scale (PSS-10)

The measure of perceived stress was based on the PSS-10 (Perceived Stress Scale), which was constructed by Cohen et al. (1983). The PSS-10 is a scale assessing the extent to which individuals see their lives as stressful over the last month period. The answers were measured on a five-point scale;

higher scores mean higher levels of perceived stress. It has been shown that the PSS-10 shows a high level of reliability from .74 to .91.

Demographic Questionnaire

A demographic questionnaire that was developed from scratch was administered in order to obtain data about the age of the participants, their gender, the school they went to, their family structure, the general environment of the house they live in, the amount of nicotine in their vaping, and their exposure to vaping ads.

Procedure

Pilot Study

A pilot study was carried out using 12 respondents in order to determine the readability and understandability, as well as the estimated time required to complete the research instruments. Consent forms were signed before the start of the research. Changes were made based on feedback received; the estimated time was lowered from about 30 to 40 minutes to 10 to 15 minutes, and all the answer choices in Likert scale were presented on each page.

Main Study

The participants were recruited from schools and vape outlets based on approval of the institution and ethics. The questionnaires were then filled after obtaining their consent. In total, there were 180 responses out of which 30 responses were discarded owing to the fact that they did not qualify the screening process. The final sample comprised 150 participants. Data were entered and analyzed using the Statistical Package for the Social Sciences (SPSS).

Statistical Analysis

Analyses of the data involved the use of SPSS (version 27). The study involved the use of Pearson Product Moment Correlation analysis of peer influence, sensation seeking, curiosity and different aspects of vaping behavior which include stimulant effect, aversion, negative and positive reinforcement. To further explore the predictive role of peer influence, sensation seeking, and curiosity on vaping behavior, multiple hierarchical regression analyses were performed. In these analyses, perceived stress was entered as a covariate in the first step, followed by peer influence and sensation seeking in the second step, and curiosity total scores and subscales (embracing and stretching) in the third step to assess their mediating effects. Statistical significance was evaluated at the 0.05 and 0.01 levels.

Ethical Considerations

Proper ethical considerations were adhered to during the research. Approval from the department was gained prior to conducting the research. The participants granted their consent and understood that they could leave the experiment at any time. The confidentiality of the information was respected, and participation in the experiment was voluntary and not forced. Permission to use scales was gained.

RESULTS

Table 2 Correlations of Peer Influence, Curiosity, Sensation Seeking, and Vaping Behavior Subscales (N = 150)

Variable	1	2	3	4	5	6	7	8	9	10	M	SD
1.Stress	-----										19.76	5.44
2.Peer Influence	.10	—									.77	.42
3.Curiosity	.05	.24**	—								33.64	7.83
4.Sensation Seeking	.11	.47**	.54**	—							27.32	6.93
5.Embracing	.04	.29**	.89**	.55**	—						16.85	4.02
6.Stretching	.06	.20*	.95**	.46**	.78**	—					16.84	4.41
7.Stimulant Effect	.14	.07	.12	.12	.16	.07	—				7.57	5.62
8.Aversion	.28**	-.05	-.04	-.07	.04	-.08	.38**	—			4.12	3.46
9.Negative Reinforcement	.07	.08	.13	.12	.18*	.04	.75**	.37**	—		9.00	5.19

10.Positive	.15	.12	.16	.28**	.22**	.10	.63**	.38**	.74**	----	12.53	6.13
Reinforcement										-		

Note. *M=Mean, SD=Standard Deviation*

*** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed)*

Findings showed that peer influence did not show a statistically significant direct relationship with vaping behavior. However, it was positively correlated with curiosity (total scores), particularly embracing and stretching (subscales of curiosity). This indicates that interaction with peers may serve as a source of curiosity, leading individuals toward new and exploratory experiences rather than directly influencing vaping behavior. Sensation seeking was also positively associated with curiosity and its subscales, suggesting that individuals with higher sensation-seeking tendencies are more inclined toward curiosity-driven exploration within peer contexts. Furthermore, embracing curiosity showed significant positive correlations with negative reinforcement and positive reinforcement (dimensions of vaping behavior). Sensation seeking was also positively related to positive reinforcement, indicating that individuals high in sensation seeking may vape for pleasurable or rewarding experiences. These results support that vaping behavior is influenced by embracing curiosity, which reflects a willingness to experience novelty, and suggest that greater acceptance of novel experiences particularly among sensation-seeking individuals increases vulnerability to vaping for both positive and negative reinforcement motives.

Table 3

Curiosity (Embracing, Stretching) as Mediator between Peer Influence and Vaping Behaviors

Variables	Aversion	Stimulant Effect		Negative Reinforcement		Positive Reinforcement		
	B	ΔR^2	β	ΔR^2	β	ΔR^2	$\beta?$	ΔR^2
Model 1	.28	.07	.13	.01	.06	-.002	.15	.01
Stress								
Model 2	.28	.06	.13	.01	.06	-.002	.14	.02
Stress								
Peer Influence	-.05		.07		.08		.16*	
Sensation Seeking								
Model 3	.28	.06	.13	.02	.06	.04	.140	.03
Stress								
Peer Influence	-.05		.03		.03		.074	
Embracing	.08		.22*		.36***		.20**	
Stretching	.28		-.10*		-.22**		-.04	

The above table indicates that in Model 1 stress showed significant prediction for aversion form of Vaping behavior.

In Model 2, peer influence was added and significantly predicted positive reinforcement form of Vaping behavior. In Model 3, curiosity total scores and subscales added to see the its mediation effect on Vaping

behavior. Findings revealed that Embracing related curiosity subscale significantly predicted Stimulant Effect, Negative reinforcement and Positive Reinforcement. It depicts that with curiosity disposition of trying new experiences, vape users are more likely to Vape for stimulation, enjoyable, positively reinforced sensation and avoid negative situations. Since Peer influence had direct relationship with negative reinforcement related Vaping behavior in model 2. In model 3, Peer influence still expressed prediction after addition of curiosity subscales (mediator). This suggests partial mediation effect of Embracing on peer influence in further effecting Vaping behavior. In contrast, the stretching dimension showed significant negative prediction for Stimulant effect and negative reinforcement. However, it did not serve as mediator for peer influence and vaping behavior. Overall, findings suggest that curiosity, particularly its embracing component, plays a mediating role in the relationship between peer influence and negative reinforcement-related motives for vaping.

Table 4

Curiosity (Embracing, Stretching) as Mediator between Peer Influence and Vaping Behaviors

Variables	Aversion		Stimulant Effect		Negative Reinforcement		Positive Reinforcement	
	B	ΔR^2	β	ΔR^2	β	ΔR^2	$\beta?$	ΔR^2
Model 1				.012	.076			
Stress	.277	.070	.137			-.001	.190	.018
Model 2	.282	.072	.131	.015	.068			
Stress						.008	.142	.073
Sensation Seeking	-.090		.098		.126		.248*	
Model 3	.285	.065	.136	.019	.076			
Stress						.041	.145	.076
Sensation Seeking	-.115		.067		.076		.239	
Curiosity	-.069		.18*		.78**		.18*	
Embracing	-.079		-.149		-.250		-.177**	
Stretching	.123		.200		-.329		.180	

In Model 1, stress was entered as a covariate and significantly predicted aversion ($\beta = .277, \Delta R^2 = .070$), while its effects on stimulant effect, negative reinforcement, and positive reinforcement were nonsignificant, showing very small increments in explained variance.

In Model 2, sensation seeking was added, which explained additional variance in positive reinforcement ($\Delta R^2 = .073$), with sensation seeking emerging as a significant predictor ($\beta = .248, p < .05$). For aversion, stimulant effect, and negative reinforcement, (Vaping Behavior) sensation seeking did not account for

meaningful variance. In Model 3, sensation seeking and curiosity were included, further increasing the explained variance for stimulant effect ($\Delta R^2 = .019$), negative reinforcement ($\Delta R^2 = .041$), and positive reinforcement ($\Delta R^2 = .076$). Within this model, curiosity, particularly stretching was positively associated with stimulant effect ($\beta = .18, p < .05$) and positive reinforcement ($\beta = .18, p < .05$), and strongly with negative reinforcement ($\beta = .78, p < .01$), while embracing showed a negative association with positive reinforcement ($\beta = -.177, p < .01$). These results indicate that Model 3 explains the most variance across reinforcement outcomes, highlighting curiosity as a key mediator, while stress primarily relates to aversion.

DISCUSSION

In present research, the effects of peer pressure and sensation seeking on vaping behavior have been assessed using curiosity as the mediating psychological factor. These results contribute significantly to the understanding of the complicated process of vaping onset and persistence, which is a phenomenon that has become more common among young people around the world (World Health Organization, 2024).

In line with previous studies, sensation seeking had a strong relationship with curiosity, which is consistent with the theory proposed by Zuckerman (1994) stating that sensation seekers seek novel, challenging, and stimulating experiences. The results are consistent with previous studies demonstrating that people who score highly on sensation seeking tend to indulge in health-risking behavior such as substance use due to their need for novel experience and arousal (Hoyle et al., 2002; Ksinan & Vazsonyi, 2016). In this respect, vaping may be considered a way of fulfilling the needs of sensation seeking and exploration.

Moreover, the results indicated that curiosity, specifically embracing curiosity, was an important predictor for vaping. The embracing aspect of curiosity had a positive relationship with stimulant effects and reinforcement motives, which implies that people who are open to uncertainty and novelty tend to vape not only to boost their pleasurable feelings but also because of negative feelings. These findings can be explained using the theory of curiosity-driven behavior put forward by Berlyne (1960) and in line with existing empirical evidence on the motivational role of curiosity in vaping initiation and persistence (Margolis et al., 2018; Leventhal et al., 2024). As for stretching curiosity, which represents a cognitive approach to the search for knowledge and development, it had a negative correlation with stimulant effects and negative reinforcement.

Indeed, in this study, mediation analyses showed that curiosity was an important mediator connecting sensation seeking and peer influence to vaping. Sensation seeking on its own was not always found to be a predictor of reinforcement-based motives for vaping. However, it became significant in predicting reinforcement-based motives once curiosity became a mediator. This means that sensation seeking is a general motivational state, while curiosity is what determines the behavior from the motivational state. Like sensation seeking, peer influence did not predict vaping behavior on its own but predicted curiosity specifically embracing curiosity. These results are consistent with the Social Learning Theory by Bandura (1977).

On the other hand, stress, used as a covariate in the analysis, showed very limited predictive potential and was mostly connected with vaping aversion as opposed to the reinforcement-based motives. Whereas stress is known to be one of the major causes for substance abuse and misuse in general (Sinha, 2008), the absence of any significant effects in the current analysis shows that during young adulthood, explorative motives and personality characteristics as well as social influence may be stronger motivators for vaping than stress-related emotional regulation.

In terms of culture, the results of the analysis are especially important against the backdrop of a collectivist sociocultural setting of Pakistan, where peer influence plays a central role in the formation of the behavior and attitude of an individual during young adulthood. Since social acceptance and

conformity to norms of the group play a crucial role in such cultures, it explains the indirect influence of peer relationships on vaping through curiosity instead of the direct impact. Curiosity, in such situations, can be viewed as a way of engaging in behavior considered as socially acceptable. Vaping is seen in such cultures not as a deviant but an explorative behavior.

In summary, these results emphasize the significance of curiosity, especially the embracing one, as an important psychological aspect in the examination of vaping among young adults. The preventive strategy that concentrates only on educating about the health hazards or resisting peer pressure might not be sufficient. Therefore, the intervention strategy should tackle the experimentation of young adults driven by curiosity and their tendency towards thrill-seeking, through using these drives to direct them into healthy thrilling activities like sports, artistic hobbies, and so on. In addition, the current study adds to the body of literature on the psychosocial antecedents of vaping, and it calls for the development of multifaceted interventions taking into account psychological and cultural aspects.

CONCLUSION

In conclusion, the findings from this research reveal that curiosity is one of the important mechanisms via which peer pressure and sensation seeking translate to vaping. This research will contribute to the existing literature by pointing out some of the psychological traits that motivate risky health behaviors, as well as providing a basis for making effective preventative measures.

Present research focuses on the independent effect of stretching form of curiosity on the effects of stimulation and negative reinforcement in vaping-related behavior. Acceptance of curiosity has an effect on positive and negative motivations like the need to vape for stimulation. Acceptance of curiosity and openness to experiences can influence peer pressure and sensation seeking, leading to vaping for negative reinforcement. The findings indicate that acceptance of curiosity is one of the important psychological mechanisms through which social influences translate to behavioral effects of Vaping.

Limitations

- It is difficult to make causal interpretations due to the cross-sectional nature of this research, regarding the influence of peers, psychological variables, and Vaping behavior.
- This research made use of self-reports to measure all the constructs, which can be influenced by social desirability or memory bias when dealing with sensitive issues such as Vaping.
- The participants participated in this research were occasionally and regularly Vaping users that did not have the stage of addiction to nicotine, therefore, there was a need to do the research on nicotine dependent individuals.

Suggestions

- The future studies will have to utilize a longitudinal design to explore changes in the impact of these variables on vaping over time.
- Objective methods such as the use of technology to measure the frequency of using a vaping device and physiological measurements can improve reliability of results by confirming the self-reporting information.
- Vape users dependent on nicotine have to be used as a clinical sample in further studies to obtain etiological information.

Implications

- The findings indicate that mental health professionals treating young adults must evaluate their curiosity-based and sensation-seeking attributes when dealing with vaping and other substance-abuse behaviors.
- Counseling methods that focus on awareness, sound judgment, and constructive expression of curiosity can play an important role in preventing vaping experimentation.
- Psychoeducational campaigns that challenge misconceptions and highlight long-term health consequences may be effective in reducing curiosity-driven vaping initiation.

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