

IMPACT OF PERSONALITY TRAITS AND PEER INFLUENCE ON SMOKING BEHAVIOR AMONG UNIVERSITY STUDENTS; WITH THE MEDIATING ROLE OF HEALTH RISK PERCEPTION

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ABSTRACT

The current study analyzed the direct and indirect effects of personality traits and peer influence on smoking behavior of university students along with the mediation role of health risk perception. A quantitative correlational research methodology was used. Data were collected from a sample of male university students through purposive sampling from government and private sector universities of Bhakkar, Pakistan. Standardized scales in psychology were used, and data analysis was done through descriptive statistics, Pearson's correlation, independent samples *t*-test and hierarchical regression analysis. It was found that peer influence had statistically significant positive correlation with smoking behavior and acted as strong positive predictor of smoking behavior of students. On the other hand, personality traits had no statistically significant effect on smoking behavior. Independent samples *t*-test results found no statistically significant difference in smoking behavior between undergraduate and graduate students. Regression results revealed that health risk perception had partially mediated the relationship between peer influence and smoking behavior, increasing the explanatory power of the model significantly. This study highlights the fact that social peer interactions are the main motivator of student smoking behavior, while health risk perception is an important mediator.

I. INTRODUCTION

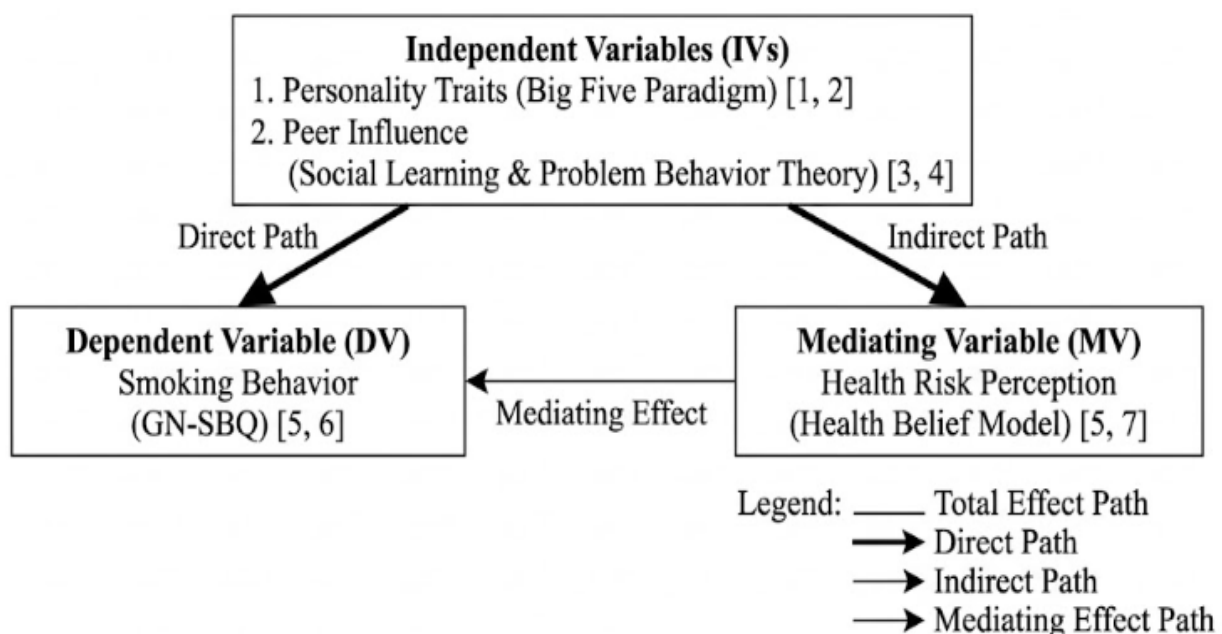
Millions of avoidable deaths are caused by cigarette smoking every year which make it one of the worst public health issues in the world. Despite increased awareness of the health concerns associated with smoking, young people continue to smoke and the majority is of college and university students. Scientists have stressed that smoking cigarettes is the most avoidable cause of death for the last 10 years (Saha et al., 2007). Previous estimates indicated that tobacco-related deaths would approach ten million per year. More than 7 million of these deaths result from direct tobacco use, while approximately 1.2 million are attributed to non-smokers exposed to secondhand smoke (World Health Organization [WHO], 2020). University students are an especially vulnerable population since this time of life who involves increased independence along with exposure to varied social situations and increased academic stress. On the same time peer pressure becomes a significant factor which drives some adolescents to smoke in order to be accepted or to fit in socially (Finnerty et al., 2010). Other motivators such as curiosity as well as experience seeking or using cigarettes as a coping mechanism also increase the risk. The experience from these preliminary connections may go a long way towards persuading future

smoking behavior. According to empirical studies those students living in hostels and associating with friends who smoke are more predisposed to the initiation of smoking behavior (Green Jr et al., 2013; Ngahane et al., 2015; Li & Guo, 2016).

Factors of personality and peer pressure are also involved in smoking behavior of students at universities as well as mediating role of health risk perceptions. This viewpoint is vital because smoking behavior is not affected merely by nicotine, but psychological factors, habits, and social reinforcement play an important role in sustaining cigarette use. Analysis of cigarette dependence among university students will help identify those who may become prone to more health and behavioral glitches (Barlow et al., 2014). Such information allows designing programs for addressing not only smoking behavior but also various psychological needs of young adults. Research shows that personality traits and peer pressure play an important role in students' smoking behavior. Some personality features like high levels of impulsivity and sensation seeking or low levels of conscientiousness may inspire them to take risks and smoke (Roberts et al., 2017). Peer influence, on the other hand, improves the above-mentioned personal factors by establishing standards, providing opportunities, and strengthening actions. It should be noted that these connections are not direct but they depend on students' perceptions about health risks. Those students who think that smoking is associated with great health risks will most likely avoid smoking, regardless of their risky behavior or intense peer pressure (Chen et al., 2023). Despite the detailed information on the risks of smoking, its incidence rate among university students is a problem, especially in less developed countries. The fact highlights the importance of knowing the factors influencing smoking at universities. In Pakistan, the number of smokers increases compared to the decreasing rate in many developed countries (Reitsma et al., 2021).

One experiment carried out to found the effect of smoking peers on college students showed that just having one smoker in a small group of people amplified the number of cigarettes smoked in social interaction significantly. This proves that modeling and passive imitation have vast impacts on smoking behaviors in young people (Harakeh & Vollebergh, 2013). Another experiment was carried out to assess the role of risk perception in smoking behavior and cessation intention in university students. They concluded that risk perception is a dynamic factor that affects the relationship between knowledge about smoking risks and behavior (Kaufman et al., 2019).

Figure 1: Theoretical framework depicting the hypothesized direct and indirect effects of proximal factor clusters on multiple dimensions of adolescents smoking behavior, mediated by health risk perception integrated with established behavioral theories



Hypotheses

- H₁ There is no significant difference in smoking behavior between under-graduate and graduate students.
- H₂ There is positive relationship between peer influence and smoking behavior.
- H₃ Peer influence will predict the positive effect on smoking behavior.
- H₄ Extraversion has positive relationship with smoking behavior.
- H₅ Health risk perception mediates the relationship between personality traits and smoking behavior among university students.

II. LITERATURE REVIEW

Longitudinal evidence indicates that early personality traits, particularly lower self-control and higher aggression, significantly predict long-term smoking habit in adulthood (Welch & Poulton, 2009). meaning that lack of trust in the society and emotions may play a role in smoking maintenance. Scientists found out that those people who achieved to quit smoking between 18 and 26 years old showed important gains in emotional stability and self-control. Usually speaking, this study suggests that therapies that focus on regulatory emotions and self-control can be effective in treating smoking among young people. Among college student's impulsivity related traits specifically urgency and sensation seeking serve as strong predictor of smoking initiation and frequency (Spillane et al., 2010). Pupils with high scores for these characteristics were more likely to try cigarettes and smoke more frequently. Smoking habit was less strongly correlated with traits like lack of perseverance and lack of premeditation, indicating that emotional impulsivity and the need for excitement may be especially important in early adulthood. The authors contended that emotional impulsivity should be addressed in preventative initiatives, possibly by providing healthy outlets for enthusiasm and enhancing coping mechanisms (Spillane et al., 2010). Numerous investigations using the Big Five Personality model have additionally demonstrated the association between personality and smoking habit. For example, Hakulinen and colleagues found that current smokers generally had relatively low scores on conscientiousness and high scores on extraversion and neuroticism compared to non-smokers in a meta-analysis study involving nine cohorts.

They also discovered that smoking beginning is generally predicted by high extraversion and poor conscientiousness, while relapse is associated with higher neuroticism. These findings corroborate the assumption that emotionally reactive and less disciplined personality types are more inclined to participate in smoking (Hakulinen et al., 2015). People with higher levels of neuroticism and openness were more likely to have smoked at some point in their life according to a 10-year follow-up study. Additionally, low conscientiousness predicted both the switch to daily smoking and chronic smoking over time. This shows that personality qualities determine not only whether someone starts smoking but also whether they continue the habit (Terracciano et al., 2015). A superb study revealed high evidence of peer influence in a nationally representative U.S. sample. Their study indicated that a 10 percent increase in classmates who smoke boosted an individual's likelihood of smoking by over 3 percent, while a 10 percent increase in close friends who smoke increased the possibility of smoking by 5 percent. These peer effects remained into adulthood which indicates how formative peer contexts can have long-term consequences (Fletcher, 2010). Adolescent smoking is deeply formed by peer interactions, as friendships strongly influence both the initiation and continuing of smoking. According to research, friendship networks and smoking behavior change in tandem rather than independently. Two dynamics are shown by the longitudinal social-network analysis in which teenagers choose friends who have comparable smoking behaviors and are influenced by peers who smoke. Peer effect and selective mechanisms can help explain the high occurrence of smoking among youth and underscore the significance of concentrating prevention programs on social networks rather than individuals (Steglich et al., 2010).

Not only does smoking among adolescents involve peer influence, but it also involves how adolescents select their peers. Study displays that there is a co-evolution of smoking behavior and friendship networks where adolescents are likely to engage in smoking because their peers engage in smoking behavior and are at the same time more likely to have peers who involve in the same behavior. Therefore, peer selection and peer influence combined account for the clustering of smoking behavior among peer groups (Go et al., 2010). The longitudinal study showed for three years among students in eleven British schools inspected the impact of peer networks on the smoking behaviors of adolescents, looking at whether teenagers take up smoking due to selecting smoking friends or due to

direct influence from peers. It was found that peer selection was more influential than peer influence in determining teen smoking behavior through statistical analysis in which friendship and smoking behavior variations were measured. Peer selection became stronger while the impact of peer influence diminished gradually over time. Finding highlights the importance of school-based intervention measures that target the ways adolescents choose friends and the impact of these social ties on smoking, since it implies that teenage smoking behavior is more determined by the composition of their social network than direct peer pressure (Mercken et al., 2012). It was seen that changes in risk perception were highly associated with quit outcomes demonstrating the importance of addressing cognitive biases in smoking cessation programs (Borrelli et al., 2007).

Another research looked into how university students in Lebanon see risky behaviors what drives them and how appealing they find different kinds of risk-taking. Their findings showed that higher risk perception was associated with lower involvement in risky activities while students who regarded risky behaviors as desirable were much more likely to engage in them. In the view of the authors, the importance of health education programs in Lebanese universities should be emphasized, which involves not only increasing risk awareness, but also considering socio-psychological determinants of risky behaviors. Understanding the factors of culture, environment, and personal factors can significantly improve interventions among youth (Salameh et al., 2014). Many studies have shown that people especially adolescents and young adults, often misinterpret or downplay the health risks connected to smoking which directly affects their likelihood of either beginning or continuing the custom. Most young smokers exhibit optimism bias they underestimate the risks of developing complications such as cancer, stroke, heart ailments, and respiratory failure due to this belief. In one study, they found out that young Nepalese adults who viewed smoking as fun, socially acceptable, or stress-relieving were more prone to the habit despite their awareness about its negative implications. Their findings also indicated that those students who did not feel vulnerable thought of smoking as a "manageable risk" since short-term gains took precedence over long-term health risks (Aryal & Bhatta, 2015). This paper is focused on the impact of personality factors and peer pressure on smoking behaviour through the role of perceived health risk as a mediator. This will contribute to the understanding of how these psychological and social factors interplay and can be useful for developing counselling approaches in universities.

III. METHOD

The method section describes the research design, recruitment of participants, measurement tools, and statistical techniques employed for the empirical examination of the relationship between personality characteristics, peer influence, health risk perception, and smoking. Demographic sheet was also mentioned on inform consent and demographic information was taken from all participants. Ethical considerations were used during the collection of data will also be present in the study.

Participants

Correlation research design was used with the sample of ($N=100$) was taken for study which was distributed in university students specifically males. The data was collected in Pakistani society from the participants those belongs from different departments of private and government sector. Prior the administration of different questionnaires which were fulfilled by participants of required sample size, signed the informed consent firstly. Purposive sampling technique was used in this study and sample was equally distributed between university students of government and private sector.

Inclusion Criteria

- University students who belong from Bhakkar city and some surrounding areas.
- The participants of age from 18-48 were eligible.
- Individuals of all socioeconomic backgrounds are eligible.

Exclusion Criteria

- Individuals those are below or above from the mentioned age category are not eligible.
- Individuals those are not current smokers, not eligible.

- Individuals who are not studying in government or private sector are not eligible

Measures

[I] Big Five Inventory 10: In this study, personality traits are measured using the Big Five Inventory–10 (BFI-10). Rammstedt and John (2007) created the tool as a condensed version of the Big Five Inventory. Each of the five personality dimensions extraversion, agreeableness, conscientiousness, neuroticism, and openness to new experiences is measured by two of the ten measures as well as it has 5 reverse scored items in the scale which I have used. A Likert type scale is used to collect responses typically ranging from strong disagreement to strong agreement. In terms of reliability, prior research indicates that Cronbach's alpha values for each of the five dimensions range approximately to .75. The BFI-10 exhibits strong concept in terms of validity. The scale effectively reflects the essential elements of the five personality traits, as seen by the strong correlation between its scores and those of the complete Big Five Inventory (BFI-44). **[II]** Peer Pressure Revised Questionnaire. Saini (2016) created and updated the Peer Pressure Questionnaire–Revised (PPQ-R) scale to gauge people's vulnerability to peer pressure in social settings. A 5-point Likert scale, ranging from strong disagreement to strong agreement, is used to score the responses to the 25 self-report items. Greater perceived peer pressure is indicated by higher scores. The PPQ-R exhibits adequate internal consistency and reliability, with reported Cronbach's alpha values of about .89 while expert review and significant correlations with related psychological dimensions like social influence and conformity confirm the scale's strong construct and content validity. Permission was taken before the test application. **[III]** Health-Risk Attitude Scale: In the current study, people's attitudes on health-related crisis are evaluated using the Health Risk Attitude Scale (HRAS-13). Huls et al. (2020) constructed the scale and conducted a psychometric evaluation in a general population. A 7-point Likert scale, ranging from 1 (totally disagree) to 7 (absolutely agree), is used to grade the 13 self-report items, also 7 of them are reverse-scored. A more risk-taking attitude toward health is reflected in higher ratings. In terms of reliability, prior research indicates that Cronbach's alpha value is about .73 in general population sample. A general health-risk attitude factor is supported by factor studies, and the scale exhibits strong concept and known-group validity. All things considered, the HRAS-13 is regarded as a viable and trustworthy tool for assessing health-risk attitudes in research contexts. **[IV]** Glover-Nilsson Smoking Behavioral Questionnaire: The behavioral components of cigarette smoking dependency are evaluated in this study using the Glover-Nilsson Smoking Behavioral Questionnaire (GN-SBQ) (Glover & Nilsson, 2005). There are eleven self-report questions in all, and the total scores range from 0 to 44. Each item is rated on a Likert-type scale from 0 (not at all/never) to 4 (very so/always). The GN-SBQ exhibits strong internal consistency and reliability, with reported Cronbach's alpha values in original samples of approximately .82. In test-retest evaluations, it also demonstrates temporal stability. The GN-SBQ demonstrates construct and concurrent validity in terms of validity.

Procedure

A demographic form was design to inquire some information from the participant before filling out of questionnaire which is about the participant and that is some necessary information in the sheet which helps in gathering of data from participant it contains age of participant, education, socioeconomic status of participant, family system, family income, residence and sector in which they are studying either government or private of the target population for generalization purposes. An inform consent was signed from each participant prior to data collection that was attached on each questionnaire before demographic sheet. The current study employed a descriptive research methodology to carefully investigate the research variables. Data from the 100 participants ($N = 100$) in the study were gathered using purposive sampling a non-probability sampling technique that selects participants who are readily available and have the required characteristics which fulfill the mentioned criteria of research. This method confirmed that the researcher could collect data in a well-organized way while making sure there is diversity within the target population. The main instrument of gathering data in this case was the use of structured psychological questionnaires. The participant was supposed to read and sign an informed consent form before answering any questions. This would ensure that ethical guidelines such as decision making, deliberate participation, and confidentiality were adhered to in the research. The questionnaires were supposed to be answered in controlled settings. A demographic sheet was included apart from the main questionnaires in order to collect other related data such as age, family background, education level, and socioeconomic status. It was easy for the researcher to contextualize the outcomes and observe trends in different groups within the sample

because of this demographic data. Everything was done through permissions and informed consents it is significant to make sure that the material of the respondent remains safe. There were permissions from the author of the letter and the respondents were aware of the significance of the study and willingly contributed in it with informed consent, anonymity and confidentiality. These considerations help to protect the rights of the participants of research and improve its validity. Informed consents in writing were sought from all subjects before the collection of data. It was purely voluntary and the data collected was kept anonymous as per the ethical norms.

IV. RESULTS

Table I: Frequency and percentage of participants (N=100)

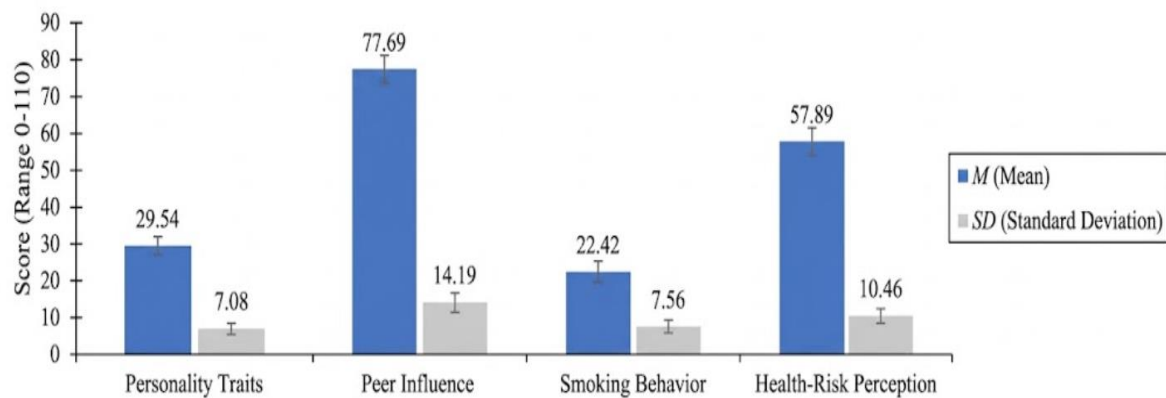
Demographic variables	<i>F</i>	%
Age		
18-22	49	49.0
22-27	51	51.0
Socio-economic status		
Lower class	6	6.0
Middle class	62	62.0
Upper class	32	32.0
Location		
Rural area	48	48.0
Urban area	52	52.0
Education		
Under-graduate	38	38.0
Graduate	62	62.0
Sector		
Government sector	54	54.0
Private sector	46	46.0
Family system		
Joint family	56	56.0
Nuclear family	44	44.0

Demographic features such as age distribution, socio-economic status, place, level of education, institution type, and family structure in the sample population ($N = 100$) are listed in Table 1.

Table II: Psychometric Properties of Scales

Variables/Scales	<i>M</i>	<i>SD</i>	Range	Cronbach's α
Personality Traits	29.54	7.08	10-40	.71
Peer Influence	77.69	14.19	38-110	.83
Smoking Behavior	22.42	7.56	4-38	.78
Health-Risk Perception	57.89	10.46	31-80	.76

Table 2 shows psychometric properties of study variables the reliability analysis indicates the reliability coefficient of all variables is satisfactory. All study variable's alpha reliability is high as ranges from (.70 - .89).

Figure II: Mean Scores and Standard Deviation for Study Scales Description**Table III: Correlation Matrix of Big Five Inventory Items**

Domains	1	2	3	4	5
Extraversion	-	.33*	.40*	.55*	.58*
Neuroticism		-	.13	.18	.32*
Agreeableness			-	.31*	.46*
Conscientiousness				-	.55*
Openness					-

* $p < .05$

Table 3 above, it can be noted that there is a statistically significant positive correlations were observed among most big five inventory domains (r ranging from = .31 to .58, $p < .05$) with the exception of neuroticism's relationship with agreeableness ($r = .31$, $p > .05$) and conscientiousness ($r = .18$, $p > .05$).

Table IV: Correlation among Study Variables

Variables	1	2	3	4	5	6	7
1. Extraversion	-	.33**	.40**	.55**	.58**	-.01	-.10
2. Neuroticism		-	.13	.18	.32**	.04	.13
3. Agreeableness			-	.31**	.46**	.00	-.19
4. Conscientiousness				-	.55**	.07	.02
5. Openness					-	-.00	.05
6. Peer Influence						-	.48**
7. Smoking Behavior							-

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 4 shows Pearson correlation among study variables ($n=100$). The findings indicate peer influence has a significant positive correlation with smoking behavior ($r = .48^{**}$, $p < .01$). However, personality traits show a non-significant positive correlation with smoking behavior ($r = .175$, $p > .05$).

Table V: Regression coefficient of personality traits and peer influence on smoking behavior

Variables	<i>B</i>	<i>SE</i>	<i>T</i>	<i>p</i>	95%CI
(constant)		4.14	.41	.67	[-6.49, 9.96]
Personality traits	.036	.09	.38	.70	[-.15, .23]
Peer influence	.472	.05	5.08	.00	[.15, .35]
R^2	.234				

Table 5 represents the regression analysis is computed with personality traits and peer influence as predictor variable and smoking behavior as an outcome variable. The R^2 value of .23 indicates that 23% variance in the dependent variable can be accounted by the predictor with $F(14.84)$ and $p < .005$. The results show that the effect

of personality is not statistically significant ($\beta = .036$, $p = .70$) on smoking behavior while peer influence is statistically significant ($\beta = .472$, $p < .001$) on smoking behavior.

Table VI: Mean Comparison of under-graduate and graduated students among Study Variables

Variables	Undergraduates		Graduate		<i>t</i> (98)	<i>p</i>	Cohen's <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Personality traits	27.84	8.02	30.58	6.28	-1.90	.06	-.39
Peer influence	78.76	10.4	77.03	16.11	.59	.55	.12
Smoking behavior	22.13	7.54	22.59	7.62	-.29	.76	-.06
Health-risk perception	57.13	9.26	58.35	11.18	-.56	.57	-.11

An independent-samples *t*-test was performed to assess any differences that existed between the undergraduates and graduate students in relation to the study variables. As shown in Table 6 below, no significant differences were found between the undergraduates and graduates with regard to personality, peers, smoking, and health risks ($p > .05$).

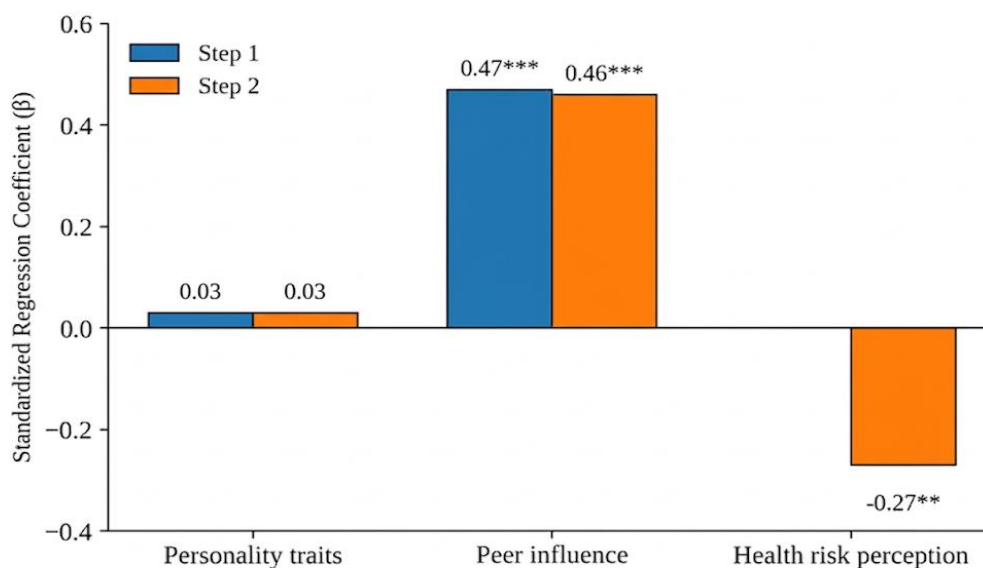
Table VII: Regression analysis for mediation of health risk perception between personality traits and peer influence on smoking behavior

Variables	<i>B</i>	95%CL	<i>SEB</i>	β	<i>R</i> ²	ΔR^2
Step 1					.23	.23***
Constant	1.73	[-6.49, 9.96]	4.14			
Personality traits	.03	[-.15, .23]	.09	.03		
Peer influence	.25	[.15, .35]	.05	.47***		
Step 2					.30	.70***
Constant	13.3	[2.72, 23.9]	5.35			
Personality traits	.04	[-.14, .22]	.09	.03		
Peer influence	.24	[.15, .34]	.04	.46***		
Health risk perception	-.19	[-.31, -.07]	.06	-.27**		

*** $p < .001$

Table 7 shows the impact of personality traits, peer influence, and health risk perception on the dependent variable. In Step 1, the R^2 value of .23 revealed that personality traits and peer influence explained 23% variance in the outcome, with the model being significant. It was discovered that there was no significant prediction for the dependent variable by personality factors ($\beta = .03$, $p = .70$) while peer influence significantly predicted the dependent variable ($\beta = .47$, $p < .001$), and peer influence also positively predicted the outcome $\beta = .47$, $p < .001$. In Step 2, the R^2 value of .30 revealed that personality traits, peer influence, and health risk perception together explained 30% variance in the outcome. The findings revealed that the personality traits were still insignificant predictors ($\beta = .03$, $p = .70$), while the peer influence was still a significant predictor ($\beta = .46$, $p = .001$), while health risk perception $\beta = -.27$, $p < .01$ was a significant negative predictor. This indicates that adding health risk perception improved the model and the relationship between peer influence and smoking behavior was partially explained through health risk perception.

Figure III: Note. Blue Bars (Step 1): Direct model variables, Orange Bars (Step 2): Mediation model variables. Standardized regression coefficient (β) showing the direct effects of personality traits and peer influence (Step 1) and the mediating role of health risk perception (Step 2) on smoking behavior ($p < .001$).



V. DISCUSSION

The present study aims to examine the impact of personality traits and peer influence on smoking behavior among university students with the mediating role of health risk perception. Hypothesis one was supported based on the analysis of independent *t*-test analysis representing that there is no difference between under-graduate and graduate students concerning smoking. In earlier studies, it was observed that there is no significant difference between students from various educational levels when it comes to their smoking behavior. A research carried out on student nurses belonging to diploma, associate degree, and undergraduate nursing programs showed that there was no significant difference between their smoking behavior, suggesting that factors other than educational attainment might be more important in influencing smoking behavior (Rausch et al., 1987). Smoking behavior is affected by social influences, belief systems, and risk perception instead of education alone, as posited in theories such as the social learning theory, theory of planned behavior, and health belief model (Rosenstock, 1974; Bandura, 1977; Ajzen, 1991).

The second hypothesis is also supported by the findings of the current study which clearly illustrate the fact that peer pressure has an impact on university students' smoking behavior. The above-mentioned finding is consistent with previous researches in the field which have found out that smoking by peers substantially increases the risk of onset and maintenance of smoking behavior among young adults. As per the researches, people who fall into peer group where the prevalence of smoking is high have greater likelihood of smoking behavior. This study brings out the role of social environment in making decisions related to health among college-going students. Also, our findings suggest that there is a positive and significant relationship between peer influence and smoking (Harakeh & Vollebergh, 2013). Social learning theory which clarifies that behaviors can be acquired through social interactions and observations provides validity for the findings of this study. People are more likely to imitate the behaviors exhibited by their peers. It is also true that peer groups play a considerable role in shaping smoking attitudes and behaviors. The above theory has been validated through empirical findings indicating that youngsters who come into contact with smokers are at higher chances of beginning and continuing smoking. The present study's outcomes of a positive relationship between smoking behavior and peer influence are consistent with existing theories (Bandura, 1977).

Hypothesis three was accepted since the regression analysis showed this hypothesis by indicating that peer influence is a significant positive forecaster of smoking behavior. This shows that students who have more contact

to peer pressure and smoking are also smokers, thereby proving the significant impact of the social environment on smoking behavior. This finding is consistent with previous studies conducted by Li and Guo (2016) who also found that young adults are more prone to smoking in case their peer's smoke. Problem behavior theory, which contends that smoking behavior is a component of a larger pattern of socially induced risk behaviors, supports this hypothesis as well. According to the notion, people tend to adopt habits that are popular in their social circles hence peer groups are crucial in developing such behaviors. Additionally, research indicates that young adults who are associated with smoking peers are more likely to smoke themselves (Jessor & Jessor, 1977). Forth hypothesis was rejected the notion that extraversion and smoking behavior are positively correlated is refuted by this research. According to earlier studies, extraversion is not a reliable indicator of smoking, and when social and environmental factors are taken into account, its impact may become negligible or even detrimental. This implies that additional psychological and contextual factors, rather than extraversion alone, have a greater impact on smoking behavior also the sample size effects the relationship between variables and in cultural context like in Pakistan, smoking behavior is not allowed openly so many young adults suppress this behavior although they have higher extraversion characteristics (Malouff et al., 2006).

According to this meta-analysis, extraversion and smoking behavior have a typically weak and inconsistent association across many research and groups. Many research reveal a non-significant link, especially when adjusting for other personality traits and demographic variables, despite some findings suggesting a modest association between greater levels of extraversion and smoking. This discrepancy implies that extraversion's ability to predict smoking behavior is constrained and fluctuates according on methodological and contextual factors. Overall, these results suggest that extraversion is not a reliable or robust predictor of smoking behavior and that other psychological characteristics and contextual factors may be more important in determining an individual's smoking habits (Munafò et al., 2007). The fifth research hypothesis was supported regression analysis found that the perception of health risk partly mediated the association between the independent variables and smoking behavior among university students ($\beta = -.27, p < .01$). This is consistent with the Health Belief Model, which proposes that health risk cognition is one of the mechanisms for how the outside world and personal characteristics affect smoking behaviors.

Limitations

It is clear that this study provides useful insights, several limitations need to be mentioned. For instance, the findings may not be as generalizable to a bigger population because of the extremely low number of participants. If there were more people in the sample and it would be more diverse, the outcomes would be more valid and representative. The study was conducted in a specific cultural environment where social norms, social stigma, and gender roles play a role in smoking behavior. It may lead to social desirability bias, and hence, participants would tend to report their smoking habits inaccurately. Smoking habit and perceived health risks may be affected by different cultural perceptions of smoking and health hazards there may be response bias when scales are applied. The cross-sectional nature of the study also poses as a limitation for making it harder to establish the causal relationships between smoking behaviors, peer influence, personality characteristics, and health risk perception. It would be much easier to assess the temporal aspect of these relations through a longitudinal study. In the study, certain personality traits were measured but no consideration was given to other psychological or environmental factors that could possibly have an important effect on the smoking behaviors such as stress, family influences, and socio-economic status. Future studies that aim at measuring smoking behaviors in college students need to consider these limits in their studies.

Suggestions

Some proposals for future research could be considered taking into consideration the limitations that have been discussed above. To enhance the generalizability of results, it would be wise to use a larger sample in future research. Also, to investigate the impact of cultural norms on smoking habit, it is worth considering the inclusion of the participants of various ethnicities. In order to find out the causal relationships between personality factors, peer influence, risk perception, and smoking habit, longitudinal research designs could be used. In addition, it could be possible to use not only inventory measures but also some objective measures or mixed measures. Moreover, in order to get a more comprehensive understanding of smoking habit among college students, some other variables should also be considered.

VI. CONCLUSION

From the study that is currently done, it has been revealed that peer pressure and personality traits are major factors that have considerable impact on university students' smoking behavior. It is shown from the findings that social surroundings are important when it comes to decisions made by the students due to the fact that peer pressure is a major predictor of smoking behavior. Differences in individuals affect smoking behavior despite the different patterns of personality factors that have an effect on smoking behavior. Furthermore, it can be seen that smoking behavior is greatly affected by health risk perception which may act as an underlying process that operates the above-mentioned factors.

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VII. REFERENCES

- Abbas, S., Shahzad, A., Shahid, E., & Basharat, A. (2025). Parenting styles and peer pressure in relation to academic performance among adolescents. *Research Journal of Psychology*, 3(1), 23–32. https://www.researchgate.net/publication/387730105_Parenting_Styles_and_Peer_Pressure_in_Relation_to_Academic_Performance_Among_Adolescents
- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179–211. [https://doi.org/10.1016/0749-5978\(91\)90020-T](https://doi.org/10.1016/0749-5978(91)90020-T)
- Allport, G. W. (1937). *Personality: A psychological interpretation*. Holt.
- Allport, G. W. (1955). *Becoming: Basic considerations for a psychology of personality*. Yale University Press.
- Allport, G. W. (1961). *Pattern and growth in personality*. Holt, Rinehart & Winston.
- Aryal, U. R., & Bhatta, D. N. (2015). Perceived benefits and health risks of cigarette smoking among young adults: Insights from a cross-sectional study. *Tobacco Induced Diseases*, 13(1), Article 22. <https://doi.org/10.1186/s12971-015-0044-9>
- Bandura, A. (1977). *Social learning theory*. Prentice-Hall.
- Barlow, D. H., Ellard, K. K., Sauer-Zavala, S., Bullis, J. R., & Carl, J. R. (2014). The origins of neuroticism. *Perspectives on Psychological Science*, 9(5), 481–496. <https://doi.org/10.1177/1745691614543304>
- Becker, M. H. (1974). The health belief model and personal health behavior. *Health Education Monographs*, 2(4), 324–508. <https://doi.org/10.1177/109019817400200407>
- Borrelli, B., Hayes, R. B., Dunsiger, S., & Fava, J. L. (2007). Risk perception and smoking cessation in medically ill smokers. *Annals of Behavioral Medicine*, 33(3), 251–259. <https://doi.org/10.1007/BF02879907>
- Champion, V. L., & Skinner, C. S. (2008). The health belief model. In K. Glanz, B. K. Rimer, & K. Viswanath (Eds.), *Health behavior and health education: Theory, research, and practice* (4th ed., pp. 45–65). Jossey-Bass.
- Chen, T., Wang, L., Cheung, Y. T. D., Wang, M. P., Lam, T. H., & Ho, S. Y. (2023). Risk perceptions and changes in tobacco use in relation to Coronavirus Disease 2019 pandemic: A qualitative study on adolescent tobacco users in Hong Kong. *Tobacco Induced Diseases*, 21, Article 92. <https://doi.org/10.18332/tid/166418>
- Conway, K. P., Green, V. R., Kasza, K. A., Silveira, M. L., Borek, N., Kimmel, H. L., & Hyland, A. (2018). Longitudinal associations between youth tobacco and substance use in waves 1 and 2 of the Population Assessment of Tobacco and Health (PATH) Study. *Drug and Alcohol Dependence*, 191, 317–324. <https://doi.org/10.1016/j.drugalcdep.2018.06.034>
- Costa, P. T., & McCrae, R. R. (1992). The five-factor model of personality and its relevance to personality disorders. *Journal of Personality Disorders*, 6(4), 343–359. <https://doi.org/10.1521/pedi.1992.6.4.343>
- Creswell, J. W. (2008). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research* (3rd ed.). Pearson Education.
- Ekpu, V. U., & Brown, A. K. (2015). The economic impact of smoking and of reducing smoking prevalence: Review of evidence. *Tobacco Use Insights*, 8, 1–35. <https://doi.org/10.4137/TUI.S15628>

- El-Amin, S., Kinnunen, J. M., & Rimpelä, A. (2022). Adolescents' perceptions of harmfulness of tobacco and tobacco-like products in Finland. *International Journal of Environmental Research and Public Health*, 19(3), Article 1485. <https://doi.org/10.3390/ijerph19031485>
- Estela, A., Sánchez-Sosa, J. J., & Del Castillo, A. (2017). Personality traits and smoking experimentation among early adolescents: A prospective study. *Journal of Adolescent Health*, 60(4), 415–422. <https://doi.org/10.1016/j.jadohealth.2016.11.018>
- Eysenck, H. J. (1967). *The biological basis of personality*. C. C. Thomas.
- Ferrer, R. A., & Klein, W. M. P. (2015). Risk perceptions and health behavior. *Current Opinion in Psychology*, 5, 85–89. <https://doi.org/10.1016/j.copsyc.2015.03.012>
- Finnerty, T., Reeves, S., Dabinett, J., Jeanes, Y. M., & Vögele, C. (2010). Effects of peer influence on dietary intake and physical activity in schoolchildren. *Public Health Nutrition*, 13(3), 376–383. <https://doi.org/10.1017/S136898000999092X>
- Fletcher, J. M. (2010). Social interactions and smoking: Evidence using multiple student cohorts, instrumental variables, and school fixed effects. *Health Economics*, 19(4), 466–484. <https://doi.org/10.1002/hec.1488>
- Furberg, H., Bulik, C. M., Lerman, C., Lichtenstein, P., Pedersen, N. L., & Sullivan, P. F. (2005). Is Swedish snus associated with smoking initiation or smoking cessation? *Tobacco Control*, 14(6), 422–424. <https://doi.org/10.1136/tc.2005.012286>
- Glover, E. D., & Nilsson, F. (2005). The Glover-Nilsson Smoking Behavioral Questionnaire (GN-SBQ): Development and psychometric properties. *American Journal of Health Behavior*, 29(5), 412–420. <https://doi.org/10.5993/AJHB.29.5.3>
- Goldberg, L. R. (1990). An alternative description of personality: The Big-Five factor structure. *Journal of Personality and Social Psychology*, 59(6), 1216–1229. <https://doi.org/10.1037/0022-3514.59.6.1216>
- Graziano, W. G., & Eisenberg, N. (1997). Agreeableness: A dimension of personality. In R. Hogan, J. Johnson, & S. Briggs (Eds.), *Handbook of personality psychology* (pp. 795–824). Academic Press. <https://doi.org/10.1016/B978-012134645-4/50031-7>
- Green, H. D., Jr., Pollard, M. S., & Tucker, J. S. (2013). The dynamic relationship between peer group movement and adolescent smoking. *Journal of Research on Adolescence*, 23(3), 509–520. <https://doi.org/10.1111/jora.12028>
- Hakulinen, C., Jokela, M., Hintsanen, M., Merjonen, P., Pulkki-Råback, L., Seppälä, I., Lyytikäinen, L. P., Lehtimäki, T., Keltikangas-Järvinen, L., & Kivimäki, M. (2015). Personality and smoking: Individual-participant meta-analysis of 9 cohort studies. *Addiction*, 110(11), 1822–1830. <https://doi.org/10.1111/add.13079>
- Hampson, S. E., Andrews, J. A., Barckley, M., Lichtenstein, E., & Lee, M. E. (2006). Personality traits, perceived risk, and risk-reduction behaviors: A further study of smoking and radon. *Health Psychology*, 25(4), 530–536. <https://doi.org/10.1037/0278-6133.25.4.530>
- Harakeh, Z., & Vollebergh, W. A. M. (2013). Young adult smoking in peer groups: An experimental-observational study. *Nicotine & Tobacco Research*, 15(3), 656–661. <https://doi.org/10.1093/ntr/nts183>
- Hughes, J. R. (2007). Effects of abstinence from tobacco. *Nicotine & Tobacco Research*, 9(3), 315–327. <https://doi.org/10.1080/14622200701188919>
- Huls, Y., Van de Voorde, C., & Denier, Y. (2020). Psychometric evaluation of the Health-Risk Attitude Scale (HRAS-13) in a general population sample. *BMC Public Health*, 20(1), Article 892. <https://doi.org/10.1186/s12889-020-08998-3>
- Isip, U., & Calvert, J. (2020). Analyzing tobacco marketing strategies using theory of triadic influence. *BMC Public Health*, 20, Article 377. <https://doi.org/10.1186/s12889-020-08479-7>
- Jessor, R., & Jessor, S. L. (1977). *Problem behavior and psychosocial development: A longitudinal study of youth*. Academic Press.
- Jung, C. G. (1971). *Psychological types* (R. F. C. Hull, Trans.; Vol. 6). Princeton University Press. (Original work published 1921)
- Kandel, E. R., & Kandel, D. B. (2014). A molecular basis for nicotine as a gateway drug. *The New England Journal of Medicine*, 371(10), 932–940. <https://doi.org/10.1056/NEJMs1405092>
- Kaufman, A. R., Waters, E. A., Parascandola, M., Augustson, E. M., & Bansal-Travers, M. (2019). Measuring cigarette smoking risk perceptions. *Nicotine & Tobacco Research*, 22(11), 1937–1945. <https://doi.org/10.1093/ntr/ntz168>
- Kothari, C. R. (2004). *Research methodology: Methods and techniques* (2nd ed.). New Age International.

- Lau, C., Stamates, A. L., & Linden, A. N. (2023). Polysubstance use patterns among young adults: Associations with psychological distress and academic outcomes. *Substance Use & Misuse*, 58(4), 512–521. <https://doi.org/10.1080/10826084.2023.2177341>
- Laursen, B., & Faur, S. (2022). Peer conformity and influence. *International Journal of Behavioral Development*, 46(3), 222–237. <https://doi.org/10.1177/01650254211015797>
- Leventhal, A. M., Greenberg, J. B., Trucco, E. M., Ameringer, K. J., & Unger, J. B. (2013). Anxiety and depressive symptoms and tobacco withdrawal. *Drug and Alcohol Dependence*, 133(2), 324–329. <https://doi.org/10.1016/j.drugalcdep.2013.06.012>
- Li, Y., & Guo, G. (2016). Peer influence on health behaviors. *Journal of Health and Social Behavior*, 57(3), 297–318. <https://doi.org/10.1177/0022146516661596>
- Loan, C. M., Khurana, A., Wright, J., & Romer, D. (2021). Peer norms and adolescent cigarette use. *Tobacco Use Insights*, 14, 1–9. <https://doi.org/10.1177/1179173X211063991>
- Malouff, J. M., Thorsteinsson, E. B., & Schutte, N. S. (2006). The five-factor model of personality and smoking: A meta-analysis. *Journal of Drug Education*, 36(1), 47–58. <https://doi.org/10.2190/9EP8-084B-M504-20LX>
- Maqsood, A., Shahzad, A., & Ahmad, M. (2024). Smoking and vaping among university students. *Tobacco Use Insights*, 17, 1–8. <https://doi.org/10.1177/1179173X241295289>
- Matthews, G., Deary, I. J., & Whiteman, M. C. (2009). *Personality traits* (3rd ed.). Cambridge University Press. <https://doi.org/10.1017/CBO9780511812736>
- Mbatchou Ngahane, B. H., Luma, H. N., Mapoure, Y. N., Afane, Z. E., & Grémillet, C. (2015). Prevalence of smoking among college students. *Archives of Public Health*, 73, Article 47. <https://doi.org/10.1186/s13690-015-0100-1>
- Mercken, L., Snijders, T. A., Steglich, C., Vartiainen, E., & de Vries, H. (2012). Dynamics of adolescent friendship networks and smoking behavior: Social network analyses in six European countries. *Social Science & Medicine*, 75(8), 1500–1510. <https://doi.org/10.1016/j.socscimed.2012.06.016>
- Munafò, M. R., Zetteler, J. I., & Clark, T. G. (2007). Personality and smoking status: A meta-analysis. *Nicotine & Tobacco Research*, 9(3), 405–413. <https://doi.org/10.1080/14622200701188851>
- Nichter, M., Nichter, M., Carkoglu, A., & Tobacco Etiology Research Network. (2007). Reconsidering stress and smoking: A qualitative study among college students. *Tobacco Control*, 16(3), 211–214. <https://doi.org/10.1136/tc.2006.018267>
- Pollard, M. S., Tucker, J. S., Green, H. D., Jr., Kennedy, D. P., & Go, M. H. (2010). Friendship networks and smoking trajectories. *Addictive Behaviors*, 35(7), 678–685. <https://doi.org/10.1016/j.addbeh.2010.02.012>
- Prabhat, J., Ranson, M. K., Nguyen, S. N., & Yach, D. (2002). Global smoking prevalence. *American Journal of Public Health*, 92(6), 1002–1006. <https://doi.org/10.2105/ajph.92.6.1002>
- Rammstedt, B., & John, O. P. (2007). Measuring personality in one minute or less: A 10-item short version of the Big Five Inventory in English and German. *Journal of Research in Personality*, 41(1), 203–212. <https://doi.org/10.1016/j.jrp.2006.02.001>
- Rausch, J. C., Nicholi, A. M., Jr., McKenna, M. A., & Johnston, R. H. (1987). Smoking behavior of nursing students. *Journal of Advanced Nursing*, 12(1), 111–119. <https://doi.org/10.1111/j.1365-2648.1987.tb01311.x>
- Reitsma, M. B., Kendrick, P. J., Ababneh, E., Abbafati, C., Abbasi-Kangevari, M., Abdoli, A., & GBD 2019 Tobacco Collaborators. (2021). Spatial, temporal, and demographic patterns in prevalence of smoking tobacco use and attributable disease burden in 204 countries and territories, 1990–2019: A systematic analysis from the Global Burden of Disease Study 2019. *The Lancet*, 397(10292), 2337–2360. [https://doi.org/10.1016/S0140-6736\(21\)01169-7](https://doi.org/10.1016/S0140-6736(21)01169-7)
- Roberts, B. W., Lejuez, C., Krueger, R. F., Richards, J. M., & Hill, P. L. (2017). What is conscientiousness and how can it be assessed? *Developmental Psychology*, 53(11), 2110–2126. <https://doi.org/10.1037/dev0000392>
- Rogers, R. W. (1983). Cognitive and physiological processes in fear appeals and attitude change: A revised theory of protection motivation. In J. T. Cacioppo & R. E. Petty (Eds.), *Social psychophysiology: A sourcebook* (pp. 153–176). Guilford Press.
- Rosenstock, I. M. (1974). Historical origins of the health belief model. *Health Education Monographs*, 2(4), 328–335. <https://doi.org/10.1177/109019817400200403>
- Rosenstock, I. M., Strecher, V. J., & Becker, M. H. (1988). Social learning theory and the health belief model. *Health Education Quarterly*, 15(2), 175–183. <https://doi.org/10.1177/109019818801500203>

- Saha, S. P., Bhalla, D. K., Whorton, T. F., & Gairola, C. G. (2007). Cigarette smoke and adverse health effects: An overview of research trends and future needs. *International Journal of Angiology*, 16(3), 77–83. <https://doi.org/10.1177/1076029607302803>
- Saini, S. (2016). *Peer Pressure Questionnaire–Revised (PPQ-R)*. National Psychological Corporation.
- Salameh, P., Waked, M., Khoury, F., Akiki, Z., & Zeidan, R. K. (2014). Risk perception and smoking behavior. *International Journal of Adolescence and Youth*, 19(3), 279–292. <https://doi.org/10.1080/02673843.2014.919599>
- Shiffman, S., Gwaltney, C. J., Balabanis, M. H., Liu, K. S., Paty, J. A., Kassel, J. D., Hickcox, M., & Gnys, M. (2002). Immediate antecedents of cigarette smoking. *Journal of Abnormal Psychology*, 111(4), 531–545. <https://doi.org/10.1037/0021-843X.111.4.531>
- Spillane, N. S., Smith, G. T., & Kahler, C. W. (2010). Impulsivity and smoking. *Addictive Behaviors*, 35(7), 700–705. <https://doi.org/10.1016/j.addbeh.2010.03.008>
- Stamates, A. L., Lau-Barraco, C., & Linden-Carmichael, A. N. (2022). High-intensity drinking, nicotine use, and cannabis use among college students: Co-use patterns and consequences. *Addictive Behaviors*, 124, Article 107111. <https://doi.org/10.1016/j.addbeh.2021.107111>
- Steglich, C., Snijders, T. A., & Pearson, M. (2010). Dynamic networks and behavior: Separating selection from influence. *Sociological Methodology*, 40(1), 329–393. <https://doi.org/10.1111/j.1467-9531.2010.01225.x>
- Terracciano, A., Stephan, Y., Luchetti, M., Albanese, E., & Sutin, A. R. (2015). Personality traits and smoking status: A 10-year longitudinal study. *Addiction*, 110(12), 1975–1981. <https://doi.org/10.1111/add.13087>
- Ukwai, J. K., Eneji, R. I., & Unwanede, C. C. (2012). Peer pressure and smoking. *Higher Education Studies*, 2(3), 92–101. <https://doi.org/10.5539/hes.v2n3p92>
- Wang, W., Li, X., & Zhang, Y. (2024). Academic performance mediators. *Frontiers in Psychology*, 14, Article 1289064. <https://doi.org/10.3389/fpsyg.2023.1289064>
- Welch, D., & Poulton, R. (2009). Personality and smoking change. *Health Psychology*, 28(3), 292–299. <https://doi.org/10.1037/a0013471>
- Wilt, J., & Revelle, W. (2016). Extraversion. In R. A. Larsen & M. L. Cooper (Eds.), *The Oxford handbook of personality and social psychology* (pp. 39–58). Oxford University Press.
- World Health Organization. (2020). *Tobacco fact sheet*. <https://www.who.int/docs/default-source/campaigns-and-initiatives/world-no-tobacco-day-2020/wntd-tobacco-fact-sheet.pdf>
- Yáñez, A. M., Leiva, A., Gorreto, L., & Primo, J. (2017). Personality and smoking behavior. *PLOS ONE*, 12(3), Article e0174211. <https://doi.org/10.1371/journal.pone.0174211>
- Zingora, T., & Flache, A. (2025). Friendship influence and adolescent behavior. *Personality and Social Psychology Bulletin*, 51(2), 145–158. <https://doi.org/10.1177/01461672251366388>
- Zvolensky, M. J., Taha, F., Bono, A., & Bakhshaie, J. (2015). Big Five and smoking. *Journal of Psychiatric Research*, 63, 91–96. <https://doi.org/10.1016/j.jpsychires.2015.02.012>