Proceedings of Scientific Research Universidad Anáhuac, 2021, 1(1): 30-36.
ISSN: in process.

Short Communication

Anxiety disorder and psychological dependence on smoking in adults from two communities in the State of Mexico

Arnulfo L'Gamiz Matuk[a]*, Víctor Saúl Ramos Tafoya[a]

[a]Centro de Investigación en Ciencias de la Salud (CICSA), Facultad de Ciencias de la Salud, Universidad Anáhuac México Campus Norte, Huixquilucan, Estado de México, México.

https://doi.org/10.36105/psrua.2021v1n1.04

ABSTRACT

Introduction: Smoking is a public health problem associated with chronic degenerative diseases. The coexistence of tobacco consumption and anxiety disorders was detected, which represent the most frequent psychiatric illnesses around the world. **Objective:** Analyze the prevalence of symptoms of anxiety and their severity as a consequence of tobacco dependence in young adults from two communities in the State of Mexico. **Material and methods:** This is a descriptive, observational, and cross-sectional study. The measurement instrument was a survey consisting of the Fagerström test, the Glover-Nilsson test, and Beck anxiety inventory. Prior informed consent applied to adults aged 18–35 years from the municipalities of Huixquilucan and Atlautla, State of Mexico with a calculated sample of 300 subjects. The analysis was carried out using SPSS Statistics, with a significance level of $\alpha = 0.05$. **Results:** 50.2% of the population were active smokers and 15.8% showed high suspicion of anxiety disorders independent of smoking. In smokers, 15.1% had scores for an anxiety disorder while more than 60% showed mild anxiety symptoms and 18.9%, moderate anxiety. A high prevalence of moderate dependence on nicotine was found in those smokers whose age of initiation of consumption was 16–19 years and who also had previous failure to abandon consumption. **Conclusion:** Anxious symptoms were found in 66% of those surveyed. This is relevant since mental illnesses have shown a significant increase, generating long-term problems in the overall health of adults.

Key words: anxiety; tobacco; addiction; dependence; disorder.

RESUMEN

Introducción: El tabaquismo es un problema de salud pública asociado a enfermedades crónico- degenerativas. Se ha detectado una elevada coexistencia de tabaquismo con trastornos de ansiedad, que representan el conjunto de enfermedades psiquiátricas más frecuentes en el mundo. **Objetivo:** Analizar la prevalencia de síntomas de acuerdo a severidad y sospecha de ansiedad como consecuencia de la dependencia de tabaco en adultos de dos comunidades del Estado de México. **Material y métodos:** Este es un estudio descriptivo, observacional y transversal. El instrumento de medición fue una encuesta conformada por las pruebas de Fagerström y Glover Nilsson y el inventario de ansiedad de Beck. Se obtuvo el previo consentimiento informado aplicados en adultos jóvenes de 18–35 años de los municipios de Huixquilucan y Atlautla, Estado de México, con una muestra calculada de 300 sujetos (menos 3 sujetos que no contestaron a cabalidad las escalas, quedando con un total de 297 sujetos). El análisis se realizó con el software SPSS, con nivel de significación $\alpha = 0.05$. **Resultados:** El 50.2% de la población era fumadora activa y 15.8% mostraron alta sospecha de trastornos de ansiedad independiente del tabaquismo. En fumadores, 15.1% mostraron puntajes para trastorno de ansiedad, más del 60% tuvo síntomas ansiosos leves y 18.9% tuvo ansiedad moderada. Se encontró alta prevalencia de dependencia moderada de nicotina en aquellos fumadores cuya edad de inicio de consumo fue de 16–19 años, quienes además presentaron fracaso previo en abandonar consumo. **Conclusión:** Se encontró sintomatología ansiosa en el 66% de los encuestados. Es importante profundizar puesto que las enfermedades mentales muestran un incremento significativo y generan problemas a largo plazo en la salud global del individuo.

Palabras clave: ansiedad; tabaco; adicciones; dependencia; trastorno.

* *Corresponding Author*: Arnulfo L'Gamiz Matuk. Centro de Investigación en Ciencias de la Salud. Facultad de Ciencias de la Salud. Address: Av. Universidad Anáhuac 46, Lomas Anáhuac, 52786. Huixquilucan, Estado de México, México, E-mail: wwgamiz@aol.com

Received: 2 September 2020.
Accepted: 9 January 2021.

INTRODUCTION

Smoking is a public health problem of great importance. It is important to make a study of its incidence in the young Mexican population. The World Health Organization (WHO) has reported an estimated projection of 8 million tobacco-related deaths by 2030. Anxiety disorders are one of the most prevalent groups of mental illnesses in the world, incapacitating an economically productive population group. They lead to complications such as depressive disorders, substance abuse or even suicide.[1,2] There are studies indicate that the presence of symptoms such as anxiety and depression are present in smokers, as well as low tolerance to frustration and hyperactivity, anhedonia, autolytic behaviors and a poor ability to cope, as well as to adapt to it. Patients who present or have anxiety traits are predisposed to substance abuse, known as "addictive personality", described by the Cloninger`s psychobiological model for addictions. The importance of establishing both anxiety disorders and harmful tobacco as comorbidities, in order to reduce the incidence of both, since substance abuse is usually related to personality or other psychiatric symptoms.[3]

Smoking is defined by WHO as a drug addiction, and the American Psychiatric Society classifies nicotine as a psychoactive substance that produces dependence without abuse. Although quitting smoking is an almost instantaneous act, a large number of people do not succeed on their own despite having good reasons for quitting and knowing the severe long-term consequences of such substance abuse.[4] Several studies have been conducted in active smokers with or without a diagnosis of psychiatric illness, in which depression is associated with smoking. In addition, tobacco consumption is strongly correlated not as a method of reassurance on the part of the consumer but as a continuous cycle that consists of craving (desire or desire to consume the substance). This cycle is related to symptoms of dependence and substance abstinence, which can further complicate future attempts to quit smoking.[3,4] According to the results of Centro de Integración Juvenil and the National Survey on Addictions, tobacco is the main starting drug. WHO indicates anxiety is an anticipation of future harm or misery, accompanied by a feeling of dysphoria and/or somatic symptoms of tension. The target of anticipated damage can be internal or external. It is an alert signal that warns of imminent danger and allows the person to take the necessary measures to face a threat.[4,5]

Anxiety disorders are one of the most common mental disorders, seconded by depressive disorders, with a worldwide prevalence of 12%. They appear from an early age with an average of 15 years and a higher prevalence between 25 and 45 years. They are more frequent in women than in men in a 2:1 ratio. Below are the criteria to diagnose generalized anxiety disorder according to the Diagnostic and Statistical Manual of Mental Disorders IV or DSM-IV.[6]

A) Excessive anxiety and worry about a wide range of events or activities.

B) Difficulty to control a state of constant worry.

C) Anxiety and worry associated with three or more of the following symptoms:

   1. Restlessness or impatience

   2. Easy fatigue

   3. Difficulty concentrating or having a blank mind

   4. Irritability

   5. Muscle tension

   6. Sleep disturbances

D) Center of anxiety and worry not limited to the symptoms of a disorder.

E) Anxiety, worry or physical symptoms causing clinically significant distress or impairment in social, occupational, or other areas.

F) Alterations not due to the direct physiological effects of a substance or a disease and not exclusive in the course of a mood disorder, a psychotic disorder or a pervasive developmental disorder.[7,8]

According to the WHO, anxiety is defined as the anticipation of possible harm or suffering, accompanied by a sensation of dysphoria and somatic symptoms of tension. The stimulus that causes the expected damage can be internal or external. It is an alarm signal that warns of imminent danger and allows the person to take the necessary measures to face possible threats. [9] It has been postulated that there could be a type of personality associated with addictive behaviors, which would serve as a marker of risk for its development. There is limited evidence of this predictive personality, which serves to mark people at high risk of developing a toxic dependence. Growing evidence shows that the genetic influence on the initiation of smoking behavior is mediated by personality: There is a positive relationship between sensation seeking and dopamine D4 receptor polymorphism.[10]

Patients who smoked without trying to give up the habit were found to have three characteristics: anhedonia, or lack of

pleasure when doing activities, low tolerance for frustration, and personality traits with a tendency to present anxiety symptoms or attacks. In a study published in the American Journal of Psychology, a model proposed by Leventhal and Zvloevzky showed the existence of emotional smokers; that is, people with exclusively psychological dependence on smoking. Physiological dependence on nicotine was excluded as part of their addiction, which does not constitute a related withdrawal symptom. Here we are talking about physiological dependence, proposing an alternative reason for smokers who are dependent on smoking for emotional characteristics, and the complex psychiatric processes independently related to dependence generated by nicotine.[10,11] This model explains the existence of crucial factors for emotional dependence on tobacco: anhedonia, low tolerance to frustration and hypersensitivity to anxiety, as well as risk factors for presenting anxiety and depressive disorders. In addition, smoking behavior patterns are manifested without a pleasant sensation when smoking; that is, they are related to anhedonia. Another study published by the same authors proposes an explanatory model of smoking and dependence, which implies a constant feeling of reward, and in turn this will increase over time.[11,12] There is evidence of a relationship between cigarette smoking and various psychopathological disorders, especially depression and various anxiety disorders.[13] In a study carried out in Galicia, the relationship between cigarette consumption and anxiety traits was analyzed in two representative samples of primary and secondary school students.[14]

The objective of this study was to analyze the prevalence of symptoms according to severity and suspicion of anxiety as a consequence of tobacco dependence in adults from two communities in the state of Mexico. The results indicate similarities in both samples: Those who never smoked had a significantly lower score in trait anxiety than those who smoked. In addition, men have a lower score in anxiety than women in all the comparisons made. These results indicate the consistent relationship between anxiety and smoking from early ages to adulthood. The implications of these results in the treatment and prevention of smoking and anxiety problems are discussed.

MATERIALS AND METHODS

A descriptive, observational and cross-sectional study. The participants were adults from 18 to 65 years of age, men and women, who were residents of the municipality of Huixquilucan, and Atlautla in the State of Mexico. From 1596 subjects, we obtained a calculated sample for a finite population of 300 subjects. Three subjects were discarded during the data analysis for not completing the instrument, and 297 subjects remained. The measurement instruments were self-applied scales (prior informed consent) validated in the Mexican population: Fagerström test for nicotine dependence to identify subjects with tobacco addiction, the Glover-Nilsson scale for psychological dependence on tobacco, and Beck anxiety Inventory.

We researched whether or not the subjects were active smokers and had previous attempts on quitting tobacco consumption; the three scales were subsequently applied. The application was carried out from April to June 2019 in both municipalities. Subsequently, each survey was evaluated, scoring the severity of each symptom and variable introduced.

For nicotine dependence evaluated through the Fagerström test, the results are interpreted as: 0–3 mild dependence, 3–6 moderate dependence, and > 6 high dependence on nicotine. For psychological dependence on smoking according to the Glover-Nilsson scale, the scores are: < 12 mild psychological dependence, 12–23 moderate psychological dependence, 24–32 severe psychological dependence, and 33 or more, very severe psychological dependence.

For quantification of anxiety symptoms and suspicion of anxiety disorders by Beck inventory, the interpretation is as follows: 0 without anxiety symptoms, < 21 mild anxiety, 21–34 moderate anxiety, and 35 anxiety disorder. This information was collected in a database analyzed with SPSS Statistics, setting the level of significance at $\alpha = 0.05$.

Statistical analysis

A descriptive analysis of relative frequencies for qualitative variables in percentages and quantitative variables with central and deviation trends.

RESULTS

The results show that 50.2% of the studied population were active smokers (see Table 1). Adolescence is the period when most adults started smoking. The highest age at which smoking starts is 16–18 years, gradually rising from early adolescence (15 years). After 18 years, beginning to smoke becomes rarer (Figure 1).

Anxiety symptoms in adults regardless of smoking habit

Regardless of the presence or absence of smoking, it was found that 66.2% of adults presented symptoms and signs

https://doi.org/10.36105/psrua.2021v1n1.04

Table 1. Smoking and non-smoking adults in both communities.

		Frequency	Percentage	Valid percentage	Accumulated percentage
Valid	Yes	149	50.2	50.2	50.2
	No	147	49.5	49.5	99.7
	No answer	1	.3	.3	100.0
	Total	**297**	**100.0**	**100.0**	

Table 2. Anxiety symptoms in adults from both communities regardless of smoking measured using Beck anxiety inventory.

		Frequency	Percentage	Valid percentage	Accumulated percentage
Valid	No anxiety	17	5.7	5.7	5.7
	Mild anxiety	196	66.2	66.2	72.0
	Moderate anxiety	45	15.2	15.2	87.2
	Severe anxiety	34	11.5	11.5	98.6
	None	5	1.4	1.4	100.0
	Total	**297**	**100.0**	**100.0**	

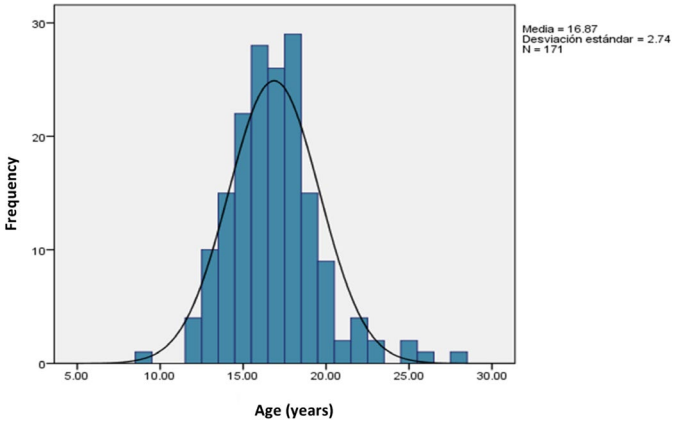

Figure 1. Age of beginning of cigarette consumption in adults by frequency.

of mild anxiety while 15.2% scored for moderate anxiety. 11.5% presented symptoms of severe anxiety and 5.7% of the population did not present symptoms of anxiety measurable by the Beck scale (α = 0.005 with a 95% confidence interval, CI) (Table 2).

Symptoms of anxiety in smokers and non-smokers

Anxiety levels were evaluated both in smokers and non-smokers. The results obtained from the Beck anxiety inventory (α = 0.005, 95% CI) showed that 66.2% of the subjects presented mild anxiety, 15.2% moderate anxiety, and 11.5% severe anxiety and 5.7% showed no symptoms of anxiety (Table 2). Figure 2 presents a similar frequency of mild anxiety in both smokers and non-smokers. However, there is a significant increase in moderate to severe anxiety symptoms measured by Beck inventory in smokers, compatible with the literature indicating anxiety disorders are often found along with substance abuse (See Figure 2).

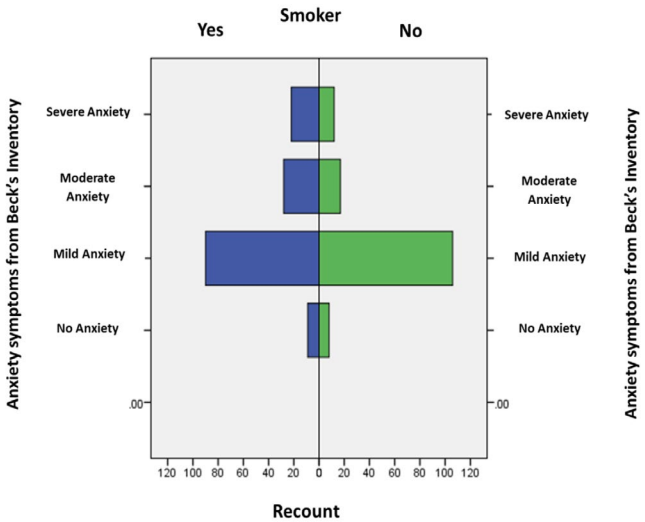

Figure 2. Smokers with anxiety symptoms by severity measured by Beck anxiety inventory.

Anxiety disorders in smokers

Only 15.7% of the smokers had a high score (> 36) for suspecting the presence of a severe anxiety disorder (α = 0.005, 95% CI); 84.3% did not present any symptoms of anxiety (Table 3). Subjects with anxiety symptoms were given recommendations to seek further assessment from mental health professionals (psychologists, psychiatrists, and local physicians) to make a deeper, more individualized interrogatory and manage the disorder. We can infer that adults who started smoking from an early age, especially at 16 years, have more difficulties and failed attempts at quitting smoking. They are followed by those who started tobacco consumption at ages 18 and 19. In contrast, subjects who started smoking at age 17 had no previous attempts at quitting smoking (Figure 3).

Psychological dependence on tobacco measured by Glover-Nilsson scale

After the application of the Glover-Nilsson scale for psychological dependence on smoking, 55.3% of the smokers presented mild psychological dependence, 28.3% had moderate psychological dependence, 9.4% showed severe psychological dependence, and 5.7% had a very severe psychological dependence (Table 4). Figure 4 shows similar results in subjects with high nicotine dependence and severe psychological dependence. A prevalence of 15.7% was found for probable anxiety disorders, independent of the smoking habit. In smokers, there was a prevalence of 15.1% for anxiety disorder, more than 60% showed scores equivalent to mild anxiety symptoms, and 18.9% scored for moderate anxiety. A high prevalence of moderate dependence on nicotine was found in those smokers whose starting age was 16–19 years and who also had previously failed to quit smoking.

DISCUSSION

The results were obtained by measurement scales validated in the Mexican population to simplify the self-application

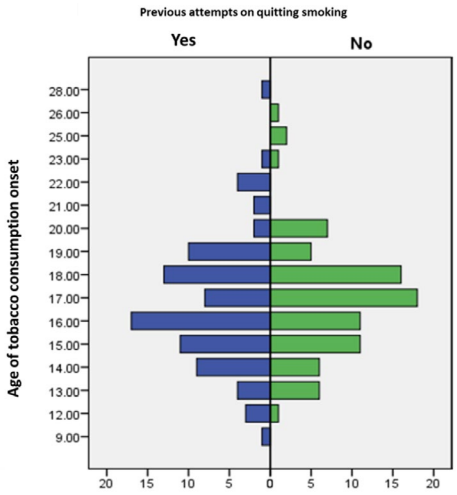

FIGURE 3. Failure to abandon tobacco consumption and age of tobacco consumption onset.

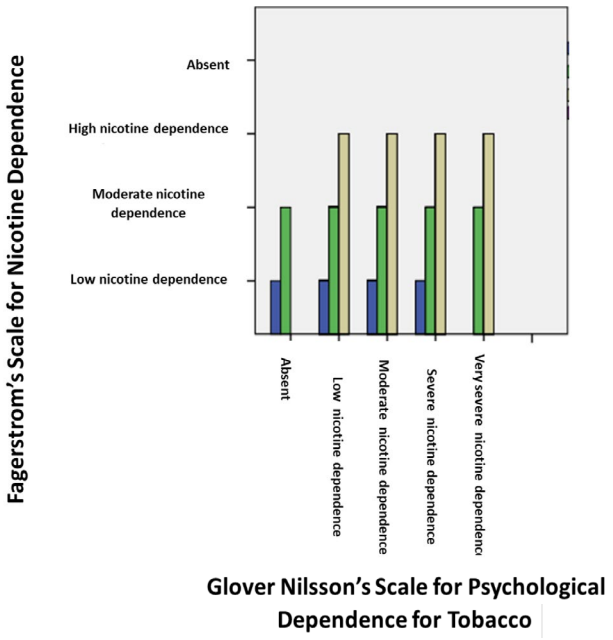

FIGURE 4. Nicotine and psychological dependence measured by Fagerström and Glover-Nilsson scales.

TABLE 3. Probable anxiety disorders in adult smokers from Huixquilucan and Atlautla measured according to Beck anxiety inventory scale.

		Frequency	Percentage	Valid percentage	Accumulated percentage
Valid	No anxiety aisorder	134	84.3	84.3	84.3
	Probable anxiety disorder	25	15.7	15.7	100.0
	Total	**159**	**100.0**	**100.0**	

https://doi.org/10.36105/psrua.2021v1n1.04

Table 4. Psychological dependence on tobacco use measured using the Glover-Nilsson scale.

		Frequency	Percentage	Valid percentage	Accumulated percentage
Valid	No signs of dependence	2	1.3	1.3	1.3
	Mild dependence	88	55.3	55.3	56.6
	Moderate dependence	45	28.3	28.3	84.9
	Severe dependence	15	9.4	9.4	94.3
	Very severe dependence	9	5.7	5.7	100.0
	Total	**159**	**100.0**	**100.0**	

and interpretation as much as possible. This study could be potentially used and improved in subsequent studies as a screening device for young adults. This population is vulnerable to substance abuse and co-existing anxiety disorders, both of which can go underdiagnosed, severely affecting life quality. The shortened version of the Fagerström questionnaire for nicotine dependence was used (6-questions instead of 8) since it omits questions on the amount (mg) of tobacco contained that the vast majority of the people surveyed are unaware of. Beck inventory for anxiety symptoms was applied. This study can be extended by comparing populations of a cohort from this original study or other populations from other communities.

In addition, anxiety disorders are prevalent: 34 subjects in the population showed high suspicions of anxiety disorder with a prevalence of 15.7%. This percentage is worth observing since it is similar to that previously reported in literature. Then, we can infer that mental anxiety disorders are an insidious and growing problem in mental and public health that have long been disregarded. Similarly, its association with substance consumption and abuse, in this case tobacco, has been well studied. There is a high prevalence in subjects who showed mild anxiety symptoms, closely followed by moderate and severe anxiety. These percentages are even higher in smokers, with an increase in symptoms of moderate and severe anxiety. The dependence on nicotine was found to be greater than psychological dependence on smoking. This also related to peaks in the age of initiation of tobacco use at 16, 17 and 18 years, who also presented no attempts to quit their smoking. Then, there is evidently a high prevalence of anxiety disorders coexisting with smoking (one of many forms of comorbid substance abuse). Therefore, both entities should be equally studied in each case.

With the original data from the group suspected of having an anxiety disorder, we can follow the subjects' evolution if they seek out mental health professionals. Furthermore, the changes and impact derived from early screening of anxiety symptoms and tobacco abuse can also be tracked. The aim is to perfect such procedures in the long run as prevention tools for public mental health and substance abuse control in the adult population. Indeed, the study has limitations regarding the number of participants and the lack of further intervention; however, it can be expanded and replicated.

Therefore, this study can be extended to relate to the use of other substances since anxiety disorders are multifactorial diseases of great importance. Having important complications associated like depression and substance abuse, which can cause severe dysfunction in multiple areas of an individual's life, it can be used as a quick, inexpensive screening tool in working population on the long run that can impact positively in the detection of common mental health disorders, such as anxiety disorders and tobacco abuse.

CONCLUSIONS

Symptoms of anxiety were present in 66% of those surveyed, so we can conclude that it is important for public health to develop more of these investigations in our country since mental illnesses have shown a significant increase worldwide. In particular, it is important to talk about anxiety disorders, diseases that affect the productive working adult population. They are clearly related to consumption and abuse of substances, in this case tobacco, which is estimated to cause high morbidity and mortality. These disorders are also linked to dependency and the inability to abandon consumption. Therefore, additional studies are required to demonstrate and expand the correlations in larger populations for the comprehensive management of these two highly relevant entities for public health in Mexico.

ACKNOWLEDGMENTS

To the people who consented to participate in the study.

CONFLICT OF INTERESTS

The authors declare no conflict since individualized authorization was received.

REFERENCES

1. Islami, Farhad, Lindsey A. Torre, and Ahmedin Jemal. Global trends of lung cancer mortality and smoking prevalence. Transl Lung Cancer Res. 2015;(4):327-38.
   https://doi.org/10.3978/j.issn.2218-6751.2015.08.04
2. Markou A. Neurobiology of nicotine dependence. Phil Trans. R. Soc. B., 2008;(363):1159-68.
   https://doi.org/10.1098/rstb.2008.0095
3. Guía de Práctica Clínica. Diagnóstico y Tratamiento de Trastornos de Ansiedad en el Adulto. México, Secretaria de Salud. 2010.
4. Valdés-Salgado R, Meneses-González F, Lazcano-Ponce EC, Hernández-Ramos MI, Hernández-Ávila M. Encuesta sobre Tabaquismo en Jóvenes 2009. Cuernavaca: Instituto Nacional de Salud Pública, 2010.
5. Secretaria de Salud. Encuesta Nacional de Adicciones. México, Comisión Nacional de Adicciones. 2011;65-76.
6. Guía de Práctica Clínica. Guía Rápida de Manejo y Tratamiento de Trastornos de Ansiedad en el Adulto. México, Secretaria de Salud. 2010.
7. Volkow, Koob, McLellan. Neurobiologic advances on the disease brain model of Addiction. NEJM. 2016;(374):363-71.
   https://doi.org/10.1056/NEJMra1511480
8. Davis B, Grier S. A tale of two urbanicities: Adolescent alcohol and cigarette consumption in high and low-poverty urban neighborhoods. Journal of Business Research. 2015;68(10):2109-2116.
   https://doi.org/10.1016/j.jbusres.2015.03.009
9. Joannie Lortet-Tieulent, Elisenda Renteria, Linda Sharp, Elisabete Weiderpass, Harry Comber, Paul Baas, Freddie Bray, Jan Willem Coebergh, Isabelle Soerjomataram. Eur J Cancer. 2015;51(9):1144–1163.
   https://doi.org/10.1016/j.ejca.2013.10.014
10. Leventhal AM, Zvolensky MJ. Anxiety, depression, and cigarette smoking: A transdiagnostic vulnerability framework to understanding emotion–smoking comorbidity. Psychol Bull. 2015;141(1):176-212.
    https://doi.org/10.1037/bul0000003
11. Chaiton, Michael, et al. Confounders or intermediate variables? Testing mechanisms for the relationship between depression and smoking in a longitudinal cohort study. Addictive Behav. 2015;(42):154-61.
    https://doi.org/10.1016/j.addbeh.2014.11.026
12. Dierker, L., Rose, J., Selya, A., Piasecki, T. M., Hedeker, D., & Mermelstein, R. Depression and nicotine dependence from adolescence to young adulthood. Addictive Behav. 2015;(41):124-28.
    https://doi.org/10.1016/j.addbeh.2014.10.004
13. Dierker, L., Hedeker, D., Rose, J., Selya, A., & Mermelstein, R. Early emerging nicotine dependence symptoms in adolescence predict daily smoking in young adulthood. Drug and alcohol Dep. 2015;(151):267-71.
    https://doi.org/10.1016/j.drugalcdep.2015.03.009
14. Olvera, H., Bakhshaie, J., Garey, L., Jardin, C., Schmidt & Zvolensky, M. J. The Role of Anxiety Sensitivity in the Relation between Trait Worry and Smoking Behavior. Nicotine & Tobacco Res. 2015;(17):682-89.
    https://doi.org/10.1093/ntr/ntu233

https://doi.org/10.36105/psrua.2021v1n1.04