Population Approaches to Tackle Addictive Behaviours
Bidirectional association between depressive symptoms and smoking cessation in youth smokers: a longitudinal study

Xian SKC[1], Chen H[2], Zhao SZ[2], Wang MP[2]

[1] Department of Sociology, Faculty of Social Sciences ; [2] School of Nursing, LKS Faculty of Medicine

Introduction

•**Importance**

Globally, 83% of current smokers started smoking at a young age of 14-25[7]. Two thirds of smokers who start smoking in their youth will face an early death because of smoking-related diseases. Quitting smoking before 30 years old can prevent over 97% of the excess mortality caused by continuing smoking[3,5].

It highlights the importance of understanding the factors associated with smoking behaviour and developing effective strategies to reduce the smoking prevalence.

•**Bidirectional associations between smoking and depression**

Positive association between depression symptoms and smoking[4, 6]. Smoking rate for people with mental illness is approximately twice that of ordinary people without mental disorders[4].

Depressive symptoms and quitting

The presence of depressive symptoms makes quitting more challenging. Compared to non-depressed smokers, smokers with depression have a lower successful rate to quit and have more failed quit attempts[1].

Quitting and depressive symptoms

Smoking cessation for 15 weeks was associated with improved depression, however instrumental variable provided inconclusive evidence[9]. There is low-certainty that smoking cessation improved depression. Evidence only support that smoking cessation does not deteriorate mental well-being[8].

Objective

This longitudinal study aims to examine the bidirectional association between depressive symptoms and smoking cessation in youth smokers receiving quitline counselling service.

The study aims to test two hypotheses:

H1 Baseline depressive symptoms was associated with smoking cessation at 1, 3, and 6 months;

H2 Smoking cessation at 1, 3, and 6 months was associated with depressive symptoms at 6 months.

Method

We conducted a prospective cohort study and analysed data of 1151 current smokers aged ≤25 years (mean age:19.4) using a youth quitline service conducted by HKU YouthQuit line from 2016 to 2022.

Depressive symptoms were assessed at baseline and 6 months by Center for Epidemiological Studies Depression scale, ranging from 0 to 60, a score of ≥16 is indicated at risk of clinical depression.

Smoking cessation (not smoking in the past 7 days) was assessed at 1, 3, and 6 months. Baseline traits of the participants were analysed and differentiated based on the presence of depressive symptoms, utilising the Chi-square test and t-test where suitable.

Linear and logistic regression were used to calculate the β and odd ratios (OR) of smoking cessation for depressive symptoms and depressive symptoms for smoking cessation.

Result

At baseline and 6 months, 40.8% and 31.9% of participants were with depressive symptoms.

Participants with depressive symptoms at baseline had significantly lower odds of smoking cessation at 1 (OR 0.62, 95% CI 0.45–0.85) and 3 (OR 0.72, 95% CI 0.54–0.97) months than those who were not, but not at 6 months (OR 0.80, 95% CI 0.60–1.07).

Participants who quit smoking at 1 (OR 0.34, 95% CI 0.22–0.54), 3 (OR 0.58, 95% CI 0.40–0.84), and 6 months (OR 0.46, 95% CI 0.32–0.66) had significantly reduced risk of having depressive symptoms at 6 months.

Table 1 Logistic regression for associations of baseline depressive symptoms with smoking cessation.

Smoking abstinence	Model 1, β (95% CI) [a]	Model 2, OR (95% CI) [b]
1-month	-0.03 (-0.04 to -0.01) ***	0.62 (0.45 to 0.85) **
3-month	-0.02 (-0.03 to -0.004) *	0.72 (0.54 to 0.97) *
6-month	-0.02 (-0.03 to -0.003) *	0.80 (0.60 to 1.07)

[a] CESD score as a continuous variable. [b] Depressive symptoms (CESD score ≥16 vs.<16), a score of ≥16 indicates at risk of clinical depression.
*P<0.05, **P<0.01, ***P<0.001.

Table 2 Linear and logistic regressions for associations of smoking cessation with depressive symptoms at 6 months

Smoking abstinence	Model 1, β (95% CI) [a]	Model 2, OR (95% CI) [b]
1-month	-5.41 (-7.38 to -3.44) ***	0.34 (0.22 to 0.54) ***
3-month	-3.69 (-5.56 to -1.81) ***	0.58 (0.40 to 0.84) **
6-month	-4.93 (-6.68 to -3.19) ***	0.46 (0.32 to 0.66) ***

[a] Linear regression, 6-month CESD score as outcome variable, [b] Logistic regression, 6-month depressive symptoms (CESD score ≥16 vs. <16) as outcome variable, a score of ≥16 indicates at risk of clinical depression. *P<0.05, **P<0.01, ***P<0.001.

Conclusion

The study firstly reported findings supporting a bidirectional association between depressive symptoms and smoking cessation in youth smokers: depressive symptoms impeded subsequent smoking cessation and smoking cessation improved later depressive symptoms.

This suggests a bidirectional relationship between depressive symptoms and smoking, highlighting the importance of addressing mental health in smoking cessation programs.

Acknowledgement

References

1.Ho CSH, Tan ELY, Ho RCM, et al. Relationship of Anxiety and Depression with Respiratory Symptoms: Comparison between Depressed and Non-Depressed Smokers in Singapore. Int J Environ Res Public Health. 2019;16(1):163. doi:10.3390/ijerph16010163

1.HKU Youth Quitline - SMOKING CESSATION RESEARCH TEAM. 2022. Accessed 2024. https://sctc.nursing.hku.hk/youth-quitline/.

2.Jha P, Ramasundarahettige C, Landsman V, et al. 21st-Century Hazards of Smoking and Benefits of Cessation in the United States. The New England Journal of Medicine. 2013;368:341-50. DOI: 10.1056/NEJMsa1211128

3.Lasser K, Boyd JW, Woolhandler S, et al. Smoking and mental illness: A population-based prevalence study. JAMA. 2000;284:2606–2610. doi: 10.1001/jama.284.20.2606.

4.Pirie K, Peto R, Reeves GK, et al. The 21st century hazards of smoking and benefits of stopping: a prospective study of one million women in the UK. Lancet. 2013;381:133–41. http://dx.doi.org/10.1016/S0140-6736(12)61720-6

5.Richardson S, McNeill A, Brose LS. Smoking and quitting behaviours by mental health conditions in Great Britain (1993-2014). Addict Behav. 2019;90:14–9.

6.Reitsma MB, Flor LS, Mullany EC, et al. Spatial, temporal, and demographic patterns in prevalence of smoking tobacco use and initiation among young people in 204 countries and territories, 1990-2019. Lancet Public Health. 2021;6(7):e472-e481. doi:10.1016/S2468-2667(21)00102-X

7.Taylor GM, Lindson N, Farley A, et al. Smoking cessation for improving mental health. Cochrane Database Syst Rev. 2021;3(3):CD013522. Published 2021 Mar 9. doi:10.1002/14651858.CD013522.pub2

8.Wu AD, Gao M, Aveyard P, et al. Smoking Cessation and Changes in Anxiety and Depression in Adults With and Without Psychiatric Disorders. JAMA Netw Open. 2023;6(5):e2316111. Published 2023 May 1. doi:10.1001/jamanetworkopen.2023.16111

Student: Xian Sze Kei Cindy, year 2, Department: Department of Sociology, Faculty of Social Sciences
Eureka supervisor: Professor Kelvin Man Ping WANG, Department: School of Nursing, LKS Faculty of Medicine