Egyptian Journal of Occupational Medicine, 2025; 49 (3) : 121 - 138

THE ASSOCIATION BETWEEN NICOTINE DEPENDENCE, HEALTH RELATED QUALITY OF LIFE AND DEPRESSION AMONG ADULT POPULATION: A CROSS SECTIONAL STUDY

By

AHMED MS

Department of Public Health and Occupational Medicine, Faculty of Medicine, Minia University, Minia, Egypt

Corresponding Author: *Ahmed MS.* ***Email:*** *sa6311509@gmail.com shimaa.mahmod@mu.edu.eg*

DOI: *10.21608/ejom.2025.396186.1376*

Submit date: *2025-06-24* ***Revise date:*** *2025-07-22* ***Accept date:*** *2025-07-25*

Abstract

Introduction: The global economy is harmed because of the millions of fatalities caused by smoking each year. It can also have a direct impact on health-related quality of life (HRQoL) in both physical and mental ways. The association between smoking and depression remains controversial. **Aim of Work:** To investigate the relationship between smoking, HRQoL, and depression among the adult population in Minia district. **Materials and Methods:** Descriptive cross-sectional study was carried out in El-Minia district on 640 participants. A validated, structured self-administered Arabic questionnaire composed of four parts: socio-demographic, Fagerstrom Test for Nicotine Dependence, PHQ-9 depression scale and SF-12 for HRQoL was used. Sample size was calculated at confidence level 95% and power of 80% using EPI INFO online calculator. **Results:** The highest percentage of respondents were males (91.9%), their mean age was 39.7 years with SD 13.3 years. There was a statistically significant higher percentage of depression (41.1%, 35.4% and 29.3%) among smokers, former smokers and never smoking group respectively. There was a statistically significant positive correlation between depression and nicotine dependence. In addition, nicotine dependence was in a significant negative correlation with both physical component score (PCS) and mental component score (MCS). According to multivariate regression analysis models, current smokers are more likely to experience depression. **Conclusion and Recommendations:** Nicotine dependence was negatively associated with HRQoL and positively associated with depression in current smokers. The findings of the current study can be used for the development of targeted interventions aimed at improving quality of life and alleviating depressive symptoms among current smokers.

Key words: Smoking, Nicotine dependence, Depression and Quality of life and Health.

Introduction

Smoking tobacco is thought to be the biggest preventable and epidemic risk factor for human health (Al Kalif et al., 2021). According to a World Health Organization report, smoking causes approximately 150 million disability-adjusted life-years and over 8 million deaths annually in low- and middle-income countries (Jing et al., 2021).

It is now increasingly prevalent in Egypt and many other emerging nations (Fouda et al., 2018). According to reports, there are more accurate indicators of smoking than the annual prevalence data. For instance, smoking more than thirty cigarettes a day is thought to be a sign of severe nicotine dependence (Albrithen and Singleton, 2015).

Smoking is a chronic nicotine dependence problem that is thought to be a significant risk factor for a number of illnesses and disabilities that impact the physical well-being of every organ in the body as well as mental health (El-Sherbiny and Elsary, 2022). Dependency on tobacco or nicotine is categorized as a behavioral and mental illness (Cui et al., 2021).

Most of earlier research measured the negative effects of smoking on physical health using morbidity and mortality indicators, whereas more recent research has focused on evaluating the effects of smoking on other health aspects using health-related quality of life (HRQoL) measures (CDC, 2020).

Since quality of life happiness and contentment in life, it is an essential component of overall well-being. Additionally, the importance of health in determining quality of life has been acknowledged, which has increased interest in HRQoL—a person's subjective assessment of their physical and mental well-being over time. On the other hand, people with low HRQoL may have several negative health outcomes, be more susceptible to illnesses, and bear a greater financial burden because of diseases. Therefore, preventing and lessening the detrimental effects on people and public health requires recognizing the risk factors linked to reduce HRQoL (Baek et al., 2024).

Smoking is more closely associated with the mental health component of HRQoL than the physical health component (Xia et al., 2019; Luo et al., 2023). Smokers appear to enjoy a considerably higher quality of life than never smokers due to the widespread perception that smoking helps to reduce stress and encourage relaxation.

However, there is growing evidence that past smokers and never smokers have higher HRQoL than current smokers (Cakmakci et al., 2017; Cheng and Jin, 2022). Additionally, it was discovered that nicotine dependency was inversely correlated with worse HRQoL scores (Dhawan et al., 2021)

According to some research, smoking and depression are related in a complex way because nicotine stimulates the release of dopamine, which is the brain neurotransmitter associated with pleasure.

Aim of Work

To explore the relationship between smoking, health-related quality of life (HRQoL), and depression.

Materials and Methods

Study design: The study was a cross-sectional study.

Place and duration of the study: It was performed among the population in the Minia district. The study was conducted from October to December 2024

Study population: Participants of the study were adult population in Minia district. Inclusion criteria: adult people who aged eighteen years or older and agreed to share in the study. Exclusion criteria: people who aged less than 18 years or refused to participate in the study. Participants were categorized according to smoking status. It includes never smokers (those who have not smoked 100 cigarettes in their lifetime), former smokers (those who have smoked 100+ cigarettes but do not currently smoke), and current smokers (those who have smoked 100+ cigarettes and currently smoke) (Yun et al., 2012).

Study Sample: The sample size was determined using the statistical software EPI-INFO 7.2.5.0. It was assumed that the greatest variability would be 50%, with a confidence interval of 95% with a margin of error of 5%. Based on these assumptions, a minimum sample size of 384 was obtained. A total of 640 individuals were recruited.A convenient sample of adults was chosen from the computerized randomly selected two villages and the main city in Minia district (urban and rural areas).

Study methods:

A well-designed and structured Arabic interview-based questionnaire was completed through field visits. **The questionnaire** had four parts:

- **The first part:** related to the demographic details of study participants including age, sex, educational level, occupation, working hours, marital status, number of

children, regular exercise, residence and monthly income.

-**The second part:** was cigarette dependence, measured using Arabic version of Fagerstrom Test for Nicotine Dependence (FTND) scale (Kassim, 2012). It has received good grades for validity and reliability assessments in a variety of cultural contexts (Jo et al., 2021). It includes six items, the total score of the six items was 10 points (El-Sherbiny and Elsary et al., 2022).

- **The third part**: was the Arabic version of the 12 item Short Form health survey (SF-12) questionnaire. The SF-12 is a reliable substitute for the SF-36. It was calculated using a specialized online calculator and utilized as indicators of mental and physical HRQoL. Prior usage of SF12 in Arabic demonstrated acceptable internal consistency and reliability (α = 0.79-0.84) (Al kalif et al., 2021).

-The forth part: was the study participants' depression symptomatology, assessed using the 9-item Patient Health Questionnaire (PHQ-9). The total score goes from 0 to 27 (Han et al., 2020). Previous research has established that a cutoff score of 10 or higher indicates depression. The score 0-4= none/ minimal, 5-9= mild, 10-14=moderate, 15-19= moderately severe and 20-27 is considered severe (Kong et al., 2023).

Consent

All participants were informed about the steps of the study. Written consent was obtained at the beginning of the study. All the data were kept confidential and used only for research purposes.

Ethical Approval

The Ethical Committee of the Faculty of Medicine at Minia University gave its approval to the study [approval No (1535/05/2025)].

Data Management

All data was analyzed using the Statistical Package for Social Sciences (SPSS) version 20. Using numbers and percentages, descriptive statistics were used to summarize the socio-demographic data and other data. The association and comparison among groups for qualitative data were analyzed using the Chi-square test as well as Fisher's exact test. An ANOVA test was performed to assess differences among the three smoking groups. The student's t-test was employed to analyze the quantitative data. Pearson and spearman correlation analysis was done. Multiple logistic regression and linear regression was used to determine predictors of depression and HRQoL. A p-value of less than 0.05 was deemed to be statistically significant.

Results

Out of the total of 640 participants, the highest percentage of respondents were males (91.9%), the mean age of the participants was 39.7 years with a standard deviation of 13.3 years.

Table (1): Frequency distribution of characteristics of the study population by smoking status (No=640)

Variables		Total No =640	Never-smokers No =198	Former smokers No =65	Current smokers No =377	P-value
Age:		39.7±13.3	37.0±14.3	41.5±13.9	40.8±12.4	0.056
Gender:	**Females**	52(8.1%)	50(25.3%)	1(1.5%)	1(0.3%)	**<0.001***
	Males	588(91.9%)	148(74.7%)	64(98.5%)	376(99.7%)	
Residence:	**Urban**	230(35.9%)	40(20.2%)	45(69.2%)	145(38.4%)	0.067
	Rural	430(64.1%)	158(79.8%)	20(30.8%)	232(61.6%)	
Occupation:	**Unemployed**	122(19.1%)	74(37.4%)	10(15.4%)	38(10.1%)	**<0.001***
	Manual	258(40.3%)	50(25.3%)	20(30.8%)	188(49.9%)	
	Non manual	260(40.6%)	74(37.4%)	35(53.8%)	151(40.1%)	
Working hours per week		48.9±19.2	46.5±18.9	50.1±21.2	49.7±19.0	0.198
Month income:	**Sufficient**	315(49.2%)	98(49.5%)	31(47.4%)	186(49.3%)	0.978
	Not sufficient	325(50.8%)	100(50.5%)	34(52.3%)	191(50.7%)	

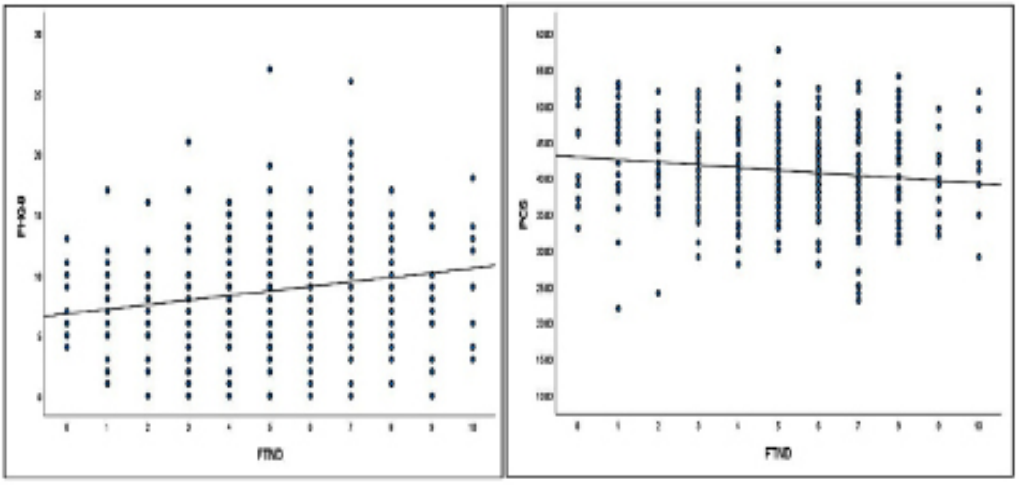
Education level:	**Illiterate/read and write**	127(19.8%)	29(14.6%)	11(16.9%)	87(23.1%)	**<0.001***
	Primary/ secondary school	134(21%)	26(13.1%)	14(21.5%)	94(24.9%)	
	High school or above	379(59.3%)	143(72.2%)	61.5%))40	196(52%)	
Marital status	**Unmarried**	114(17.8%)	59(29.8%)	11(16.9%)	44(11.7%)	**<0.001***
	Married	515(80.5%)	136(68.7%)	53(81.5%)	326(86.5%)	
	Divorced/ widowed	11(1.7%)	3(1.5%)	1(1.5%)	7(1.9%)	
Number of children		1.93±1.45	1.90±1.43	1.7±1.7	1.97±1.42	0.444
Regular Physical exercise:	**NO**	433(67.7%)	112(56.6%)	36(55.4%)	285(75.6%)	**<0.001***
	Yes	207(32.3%)	86(43.4%)	29(44.6%)	92(24.4%)	
PHQ-9		8.35±4.8	7.44±5.0	8.7±4.6	9.08±5.1	**0.006***
Depressed (scale ≥10)		236(36.9%)	58(29.3%)	23(35.4%)	155(41.1%)	**0.020***
Not depressed (scale <10)		404(63.1%)	140(70.7%)	42(64.6%)	222(58.9%)	
HRQoL:	**PCS**	41.3±6.4	42.0±6.9	41.0±5.9	40.9±6.1	0.168
	MCS	43.7±7.5	47.0±7.1	42.6±6.7	41.1	**0.015***

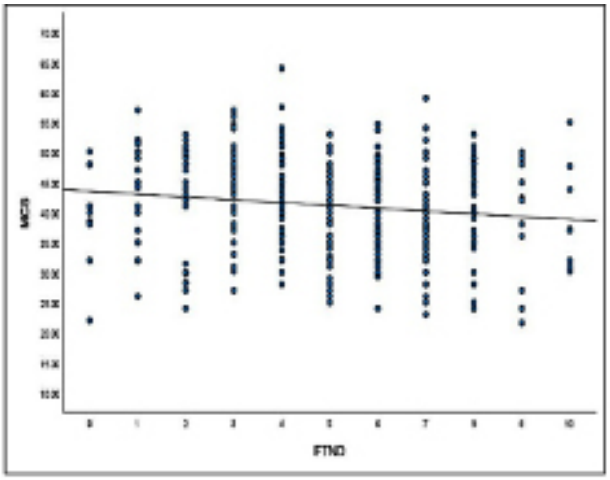
HRQoL: Health related quality of life, PCS: Physical component score,

MCS: Mental component score *: Statistically significant

Table 1 showed, in terms of socioeconomic status, (64.1%) lived in rural areas and (35.9%) lived in urban areas. As regards occupation, 40.6% of the participants had non manual work with mean of 48.9 hours per week and half of them had sufficient monthly income. In terms of education, 59.3% of the participants had a high school or above level of education. About 80% of the participants were married with mean of about two children (1.93). Additionally, 32.3% of the participants reported regular physical exercise.

There was a statistically significant higher percentage of depression (41.1%, 35.4% and 29.3%) among current smokers, former smokers, and never-smoking group, respectively (p=0.006). Moreover the MCS was significantly lower among current smokers; 41.1±7.8 vs 42.6±6.7 and 47.0±7.1 among former smokers and never smoking group respectively (p=0.015).





PHQ-9: patient health questionnaire, PCS: Physical Component Score of HRQoL, MCS: Mental Component Score of HRQoL, FTND: Fogerstorm Test for Nicotine Dependence

Figure (1): Scatterplots showing the relationships between nicotine dependence (FTND) and PHQ-9, PCS, and MCS scores among study participants

The results demonstrated a statistically significant positive correlation ($P < 0.001$) between the PHQ-9 depression score and the FTND nicotine dependence scale. This association suggested that an increase in the nicotine dependence score was associated with an increase in the PHQ-9 score. Furthermore, nicotine dependence exhibited a highly significant negative correlation with both PCS and MCS ($r= 0.205, -0.150, -0.164$, $p <0.001, 0.003$, and 0.001, respectively). [Figure 1].

Smokers with high nicotine dependence levels showed lower score of MCS and higher scores of PHQ-9 compared to smokers with low level of nicotine dependence; where mean MCS scores was 40.5 ±8.4 vs 42.0 ±8.4 among high and low nicotine dependent smokers ($p= 0.006$), and scores of PHQ-9 was 6.9 ±3.5 vs 9.8 ±4.9 ($p=0.001$) among high and low nicotine dependent smokers, but there was no effect of the degree of nicotine dependence on PCS scores (Non tabulated results).

Table (2): Multivariate logistic regression model predicting depression among studied participants (No =640)

Variables	p-value	OR	C.I.95% (lower-upper limit)	
Occupation: Non-manual (ref)	**0.030***			
Not working	**0.008***	1.999	1.196	3.342
Manual work	0.435	1.172	0.787	1.745
Insufficient month income	**0.003***	1.719	1.206	2.450
Marital status: Single (ref)	**0.034***			
Married	**0.046***	0.621	0.389	0.992
Divorced/ widow	**0.047***	0.111	0.013	0.975
Smoking status: Never smoking (ref)	**0.003***			
Former smokers	0.165	1.584	0.828	3.032
Current smokers	**0.001***	2.152	1.389	3.334
PCS	**<0.001***	0.904	0.878	0.931

*: Statistically significant

Table 2 showed that ten independent variables were regressed with depression (PHQ-9 score >10) as a dependent variable by the backward method. The coefficient of determination (R2) was 0.186 for the depression variables, meaning that 18.6% of the variability in depression status was determined by the independent variables.

Table(3): Multiple linear regression model predicting mental health component score (MCS) of HRQoL for the studied participants (No=640).

Variables	Unstandardized Coefficients		P-value	95.0% Confidence Interval for B	
	B	Std. Error		Lower Bound	Upper Bound
Age	0.059	0.020	**0.002***	0.021	0.098
Sufficient monthly income	1.650	0.531	**0.002***	0.607	2.694
Current smoking	-0.640	0.290	**0.028***	-1.209	-0.070
PHQ-9	-0.688	0.055	**<0.001***	-0.796	-0.580

PCS: physical component score of HRQoL, MCS: mental component score of HRQoL

*: Statistically significant

The backward method was employed to regress ten independent variables with MCS as a dependent variable. The MCS variables in [Table 3] had a coefficient of determination (R2) of 0.254, indicating that the independent variables accounted for 25.4% of the variability in MCS.

Table (4): Multiple linear regression models predicting depression (PHQ-9) and HRQoL components (MCS and PCS) for the current smokers (No =377).

Variables	Unstandardized Coefficients		P-value	95% Confidence Interval for B	
	B	Std. Error		Lower Bound	Upper Bound
PHQ-9 (R^2=0.171)					
Sufficient monthly income	-1.948	.439	**<0.001***	-2.811	-1.085

PCS	-.217	.036	**<0.001***	-0.288	-0.147
FTND	.291	.093	**0.002***	0.109	0.473
MCS (R^2=0.083)					
Sufficient monthly income	3.331	.788	**<0.001***	1.782	4.881
FTND	-.397	.165	**0.017***	-0.722	-0.073
Education level	.634	.310	**0.042***	0.024	1.245
PCS (R^2=0.189)					
FTND	-0.272	0.125	**0.031***	-0.517	-0.026
Age	-0.115	0.024	**<0.001***	-0.163	-0.067
Regular exercise	1.573	0.708	**.027***	0.182	2.965
PHQ-9	-0.389	0.064	**<0.001***	-0.515	-0.263

PHQ-9: patient health questionnaire, PCS:physical component score of HRQoL,

MCS: mental component score of HRQoL, FTND: Fogerstorm test for nicotine dependence

*: Statistically significant

Table 4 showed that among current smokers, multivariate linear regression to predict depression (PHQ-9) demonstrated that 17.1% of its variability was determined by monthly income, PCS, and nicotine dependence, while only 8.3% of MCS variability was determined by monthly income, education level, and nicotine dependence. In addition, PCS variability was about 19%, determined by regular exercise, depression (PHQ-9), nicotine dependence, and age.

Discussion

To the best of our knowledge, this is the first study to examine the relation between nicotine dependency, depression, and HRQoL in Minia district. The current study indicates that the elevated smoking prevalence (approximately 60%) in the Minia district is due to a diminished intention to cease smoking, challenges in overcoming nicotine addiction, insufficient readiness to quit, and the low efficacy of existing smoking cessation programs.

Depression was common among the studied participants who had never smoked, formerly smoked, and were currently smoking, at 29.3%, 35.4%, and 41.1% respectively (table 1). These results aligned with those of an Egyptian study that found that 69% of current smokers, 52.5% of former smokers, and 47.6% of never smoker group had depression with different degrees of severity (El-Sherbiny and Elsary et al., 2022). It was confirmed by another Singaporean study that smoking is linked to depression. Additionally, the study discovered a vicious loop whereby smoking-related comorbidities exacerbated depression. It also affected the effectiveness of smoking cessation efforts (Ho et al., 2019). A Tunisian study done by Ghali et al., 2019; found that current smoker had a two-fold greater rate of severe depressive illness than never smokers, which is consistent with the current study (Table 1).

Feng and Xu (2022) concluded that smoking and depression have a complex and reciprocal interaction. Patients with depression are more likely than those without depression to smoke, but they also have a worse success rate when it comes to quitting.

The current studied smokers had considerably poorer HRQoL scores with its mental component when compared to never smokers and former smokers, but not PCS (Table 1). This was in agreement with other researches from China (Xia et al., 2019; Luo et al., 2023) and from other countries such as the UK, USA, Spain (de Lossada and Rejas, 2015), Canada (Cui et al., 2019) and Turkey (Cakmakci et al., 2017). The consistent results obtained when measuring HRQoL using several instruments support the idea that smoking has a negative correlation with HRQoL.

This observed inverse relationship between smoking and HRQoL (Table 1) can be explained by the fact that smoking

raises the risk of non-communicable diseases, which lowers quality of life (Viana et al., 2019). Furthermore, prolonged use of tobacco products can cause the brain›s nicotinic acetylcholine receptors to become desensitized and reduce the release of neurotransmitters, including dopamine and serotonin. In the end, this causes anxiety and depression (Mckay et al., 2016), indicating that current tobacco users may be more vulnerable to these mental health issues than never users. Therefore, the findings of this study showed that smoking has a significant impact on HRQoL, especially its mental component.

About 30% of the studied participants had high levels of nicotine dependence, followed by low levels (22.8%), moderate levels (16.2%), very low levels (15.6%), and very high levels (15.4%) (Non tabulated results). The current results were consistent with those of a study conducted in Fayoum, Egypt, which revealed that 22.9% had low levels of nicotine dependence (El-Sherbiny and Elsary et al. 2022). Contrary to our results, a study conducted in El Mansoura found that 58.2% of the study group had high nicotine dependence, whereas 17.5% and 24.3% of the study group had moderate and mild nicotine dependence, respectively (Abu Nazel et al., 2017).

Regarding the relationship between depression and nicotine dependence by FTND, there was a statistically significant positive correlation between the studied smokers› PHQ-9 scores and nicotine dependence Figure (1). The more dependent one is on tobacco, the more severe the depressive mood. This result was consistent with multiple studies (Ho et al., 2019; Branstetter et al., 2020; Min et al., 2023). Song et al. (2024) demonstrated that smoking amount was associated with the risk of depressive symptoms. Smoking can temporarily alleviate depression by stimulating the nervous system, but long-term smoking can result in nicotine dependence, which makes depression more likely to occur (Piirtola et al., 2021).

Nicotine dependence (FTND) was significantly negatively correlated with HRQoL in its MCS but not in its PCS among the studied group (Figure 1). Stated differently, smokers with mild nicotine dependence scored higher on the MCS of HRQoL than smokers with moderate and severe nicotine dependence, which is consistent with a

study done by Xiong et al., 2024. This might be because smokers who have become dependent to nicotine face mental health challenges that impact their subjective evaluation of HRQoL.

According to multivariate regression analysis, the studied current smokers are more likely to experience depression (Table 2). In a similar way, research has indicated that smoking may increase the risk of developing depression (Wootton et al., 2020; Wu et al., 2023). A Korean longitudinal study that followed participants for 6.7 years discovered a dose-dependent link between smoking and depression risk (Park et al., 2024).

In contrast to a study done by Xiong et al. (2024), smoking was not linked to depression in a regression model despite a significant correlation between smoking and depression. This discrepancy was explained by the fact that, in their study, only 9.49% of smokers had heavy nicotine dependence, which limited the statistical power to detect a significant association. Additionally, participants with and without depression had relatively close levels of nicotine dependence. Multivariable regression analysis cannot clearly conclude that there is a significant association between nicotine dependence and depression because of the limited range of nicotine dependence scores and lower Cronbach›s alpha used to assess the level of nicotine dependence.

The significance of smoking status as a predicting variable in determining HRQoL-MCS was shown by using linear regression analysis (Table 3). Furthermore, among smokers, nicotine dependence was a significant predictor of depression and HRQoL in both of its components, MCS and PCS. According to a recent Chinese study, smokers had an 11.65% lower chance of having a higher HRQoL compared to never -smokers (Cheng and Jin, 2022). Similarly studies from China and Korea (Geng et al., 2020; Luo et al., 2023) detected that current smokers had higher adjusted odds ratios (ORs) for reduced HRQoL than both never smokers (OR, 1.17; 95% CI, 1.17–1.17) and former smokers (OR, 1.21; 95% CI, 1.21–1.21) (Baek et al., 2024).

There is a common misconception that smoking cessation will lower HRQoL because some people think it will disrupt relationships or cause them to lose the pleasures associated with smoking. However, the results of the current study showed that smoking

did not, as one might expect, improve HRQoL. This association can explore the economic evaluation of cessation programs and give people a compelling reason to stop smoking.

Conclusion

The present study concluded that nicotine dependence is negatively associated with HRQoL while positively associated with depression in current smokers.

Recommendations

Our study's results may inform therapies aimed at alleviating depressed symptoms and enhancing the quality of life for current smokers, thereby directing them towards a purposeful cessation of smoking. Consequently, anti-smoking ads must explicitly highlight the detrimental impact of tobacco consumption on HRQoL.

Limitations of the study

The study employed a cross-sectional design, hence complicating the derivation of definitive cause-and-effect correlations. The PHQ-9 measure of depression and the SF-12 measure of health-related quality of life partially overlapped in assessing depressed symptoms. The impact of this overlap on the results remains uncertain; thus, we advise future researches to acknowledge the intersection between HRQoL and depression metrics. Third, illiterate individuals need much clarification and assistance to complete the questionnaire.

Funding

The authors received no financial support related to this research.

Conflict of interest

All authors have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgement

We would like to thank all who accepted to participate in the study.

References

1. Abu Nazel M, Elkady H, Abd Allah S and Ibrahim R (2017): Pattern and correlates of tobacco smoking among mentally ill male patients in El-Mamoura Psychiatric Hospital, Alexandria, Egypt. J Egypt Public Health Assoc; 92(3):167-76.
2. Al Kalif MSH, Alghamdi AA, Albagmi FM and Alnasser AHA (2021): the negative impact of tobacco smoking on health-related quality of life among saudi adolescents during the COVID-19 pandemic. Asian Pac J Cancer Prev; 22(12):4051-6. https://doi.org/ 10.31557/APJCP.2021.22.12.4051
3. Albrithen AA and Singleton EG (2015): Brief Arabic tobacco craving questionnaire: An

investigation into craving and heavy smoking in Saudi Arabian males. J Family Community Med; 22(1):8-12. https://doi.org/ 10.4103/2230-8229.149573

4. Baek CW, Park JH, Kim DH, Kim HJ, Lee AN et al. (2024): Association between Use of Combustible Cigarettes and Noncombustible Nicotine or Tobacco Products and Health-Related Quality of Life in Korean Men: A Nationwide Population-Based Study. Korean J Fam Med. Published online September 11 2024. https://doi.org/ 10.4082/kjfm.23.0179
5. Branstetter SA, Muscat JE and Mercincavage M (2020): Time to First Cigarette: A Potential Clinical Screening Tool for Nicotine Dependence. J Addict Med; 14(5): 409–14. https://doi.org/10.1097/ADM.0000000000000610
6. Çakmakçı Karadoğan D, Önal Ö, Say Şahin D, Yazıcı S and Kanbay Y (2017): Evaluation of school teachers› sociodemographic characteristics and quality of life according to their cigarette smoking status: a cross-sectional study from the eastern Black Sea region of Turkey. Tuberk Toraks; 65(1):18-24.
7. CDC (Center for Disease Control and Prevention) (2020): Health Effects of Cigarette Smoking. Retrieved August 13, 2020 from https:// www.cdc.gov/tobacco/data_statistics/ fact_sheets/health_effects/ effects_cig_ smoking/index.htm.
8. Cheng X and Jin C (2022): The association between smoking and health-related quality of life among chinese individuals aged 40 years and older: a cross-sectional study. Front Public Health;10:779789. https://doi.org/10.3389/ fpubh.2022.779789
9. Cui MJ, GQ FEI, Sun QN, Qian YN, Meng QY et al. (2021): Construction of a risk predictive nomogram model for nicotine dependence among medical students. Chin Prev Med; 22:125–30. https://doi.org/10.16506/j.1009 6639.2021.02.009
10. Cui Y, Forget EL, Torabi M, Oguzoglu U, Ohinmaa A et al. (2019): Health-related quality of life and economic burden to smoking behaviour among Canadians. Can J Public Health; 110(5): 533–41. https://doi.org/10.17269/s41997-019-00244-x
11. de Lossada A and Rejas J (2016): Health-related quality-of-life in the smoking general population of Spain: An approach from the National Health Survey. Semergen; 42(7):431–9. https://doi.org/10.1016/j.semerg.2015.09.00
12. Dhawan P, Goel S and Ghosh A (2021): Quality of life of tobacco users- A correlation with duration of use and nicotine dependence. Indian J Tuberc ; 68: 60–4. https://doi.org/10.1016/j.ijtb.2021.08.025
13. El-Sherbiny NA and Elsary AY (2022). Smoking and nicotine dependence in relation to depression, anxiety, and stress in Egyptian adults: A cross-sectional study. J Family Community Med; 29(1):8–16. https://doi.org/10.4103/jfcm.jfcm_290_21
14. Feng YH and Xu WZ (2022): Advances in research on the relationship between depression and smoking. Chin Prev Med; 23:298–302. https://doi.org/10.16506 /j.1009-6639.2022.04.011
15. Fouda S, Kelany M, Moustafa N, Abushouk AI, Hassane A et al. (2018): Tobacco smoking in Egypt: a scoping literature review of its epidemiology and control measures. East Mediterr Health J; 24(2): 198–215.
16. Geng Y, Gu J, Zhu X, Yang M, Shi D et al. (2020): Negative emotions and quality of life among adolescents: A moderated mediation model. Int J Clin Health Psychol; 20(2): 118–25. https://doi.org/10.1016/j.ijchp.2020.02.001
17. Ghali H, Rejeb OB, Fredj SB, Khéfacha S, Dhidah L et al. (2019): Smoking dependence and anxio-depressive disorders in Tunisian smokers attending the smoking cessation clinic in a university hospital. J Egypt Public Health Assoc; 94(1): 9. https://doi.org/10.1186/s42506-019-0012-y
18. Han K, Yang S, Jia W, Wang S, Song Y et al. (2020): Health-Related Quality of Life and Its

Correlation With Depression Among Chinese Centenarians. Front Public Health; 8, 580757. https://doi.org/10.3389/fpubh.2020.580757

19. Ho CSH, Tan ELY, Ho RCM and Chiu MYL (2019): Relationship of Anxiety and Depression with Respiratory Symptoms: Comparison between Depressed and Non-Depressed Smokers in Singapore. Int J Environ Res Public Health; 16(1): 163. https://doi.org/10.3390/ijerph16010163
20. Jing Z, Li J, Wang Y, Yuan Y, Zhao D et al. (2021): Association of smoking status and health-related quality of life: difference among young, middle-aged, and older adults in Shandong, China. Qual Life Res; 30(2): 521–30. https://doi.org/10.1007/s11136-020-02645-9
21. Jo SE, Hwang HR, Kim YJ, Lee SY, Lee JG et al. (2021): Association between Time to First Cigarette and Health-Related Quality of Life of Middle-Aged Male Current Smokers: A Nationwide Representative Study in Korea. Korean J Fam Med; 42(3):225–31. https://doi.org/10.4082/kjfm.19.0103
22. Kassim S, Salam M and Croucher R (2012): Validity and reliability of the Fagerstrom Test for Cigarette Dependence in a sample of Arabic speaking UK-resident Yemeni khat chewers. Asian Pac J Cancer Prev; 13(4): 1285–8. https://doi.org/10.7314/apjcp.2012.13.4.1285
23. Kong X, Wu Y, Wang X, Sun Y, Chen K et al. (2023): Analysis of the prevalence and influencing factors of anxiety and depression in the Chinese population: A cross-sectional survey. Heliyon; 9(5): e15889. https://doi.org/10.1016/j.heliyon.2023.e15889
24. Luo Z, Xu W, Jiang S, Zhou Q, Guan Y et al. (2023): The mediating role of negative emotions in the relationship between smoking and health-related quality of life among Chinese individuals: A cross-sectional study. Tob Induc Dis; 21: 135. https://doi.org/10.18332/tid/171355
25. McKay KA, Tremlett H, Fisk JD, Patten SB, Fiest K et al. (2016): Adverse health behaviours are associated with depression and anxiety in multiple sclerosis: A prospective multisite study. Mult Scler; 22(5): 685–93. https://doi.org/10.1177/1352458515599073
26. Min HW, Wu YB and Sun XY (2023): Relation of family health and depression to nicotine dependence in adult smokers. Chin J Dis Control Prev; 27:294–9. DOI: 10.16462/j.cnki.zhjbkz.2023.03.008
27. Park SK, Oh CM, Kim E, Ryoo JH and Jung JY (2024): The longitudinal analysis for the association between smoking and the risk of depressive symptoms. BMC psychiatry; 24(1): 364. https://doi.org/10.1186/s12888-024-05828-7
28. Piirtola M, Kaprio J, Baker TB, Piasecki TM, Piper ME et al. (2021): The associations of smoking dependence motives with depression among daily smokers. Addiction; 116(8): 2162–74. https://doi.org/10.1111/add.15390
29. Song H, Zhao Y, Hu C, Zhao C, Wang X et al. (2024): Relationships among anxiety, depression, and health-related quality of life in adult epilepsy: A network analysis. Epilepsy Behav; 154: 109748. https://doi.org/10.1016/j.yebeh.2024.109748
30. 30- Viana DA, Andrade FCD, Martins LC, Rodrigues LR, and Dos Santos Tavares DM (2019): Differences in quality of life among older adults in Brazil according to smoking status and nicotine dependence. Health Qual Life Outcomes; 17(1): 1. https://doi.org/10.1186/s12955-018-1072-y
31. Wootton RE, Richmond RC, Stuijfzand BG, Lawn RB, Sallis HM et al. (2020): Evidence for causal effects of lifetime smoking on risk for depression and schizophrenia: a Mendelian randomisation study. Psychol Med; 50(14): 2435–43. https://doi.org/10.1017/S0033291719002678
32. Wu Z, Yue Q, Zhao Z, Wen J, Tang L et al. (2023): A cross-sectional study of smoking and depression among US adults: NHANES

(2005-2018). Front Public Health; 11: 1081706. https://doi.org/10.3389/fpubh.2023.1081706

33. Xia C, Zheng R, Zeng H, Zhou M, Wang L et al. (2019): Provincial-level cancer burden attributable to active and second-hand smoking in China. Tob Control; 28(6):669–75. https://doi.org/10.1136/tobaccocontrol-2018-054583
34. Xiong H, Ma F, Tang D and Liu D (2024): Correlations among nicotine dependence, health-related quality of life, and depression in current smokers: a cross-sectional study with a mediation model. Front Psychiatry; 15: 1455918. https://doi.org/10.3389/fpsyt.2024.1455918
35. Yun WJ, Shin MH, Kweon SS, Ryu SY and Rhee JA (2012): Association of smoking status, cumulative smoking, duration of smoking cessation, age of starting smoking, and depression in Korean adults. BMC Public Health; 12:724. https://doi.org/10.1186/1471-2458-12-724