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Physical, Mental and Social Wellbeing and Quality of Life among Current Smokers

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Abstract

Cigarette smoking has known negative effects on physical and mental health. Over 16 million Americans suffer from smoking-related illnesses, and one-third of individuals with mental health issues are also cigarette smokers. Both physical and mental health are associated with measures of overall quality of life, a critical outcome that can influence treatment, intervention, and prevention decision-making. However, the direct relation between smoking and quality of life is not clear and requires further investigation. The present study utilized data from 34,309 adults who participated in Wave 5 of the Population Assessment of Tobacco and Health (PATH) to examine the relation between smoking and quality of life while considering the mediating effects of physical and mental health, and the moderating effect of social satisfaction. Using Conditional Process Analyses to integrate mediation and moderation approaches, the present study found that smoking had indirect associations with quality of life mediated through both physical and mental health and that social satisfaction moderated these relationships. Additionally, smoking had an independent direct effect on quality of life that was not moderated by social satisfaction. Results suggest the negative impacts associated with smoking reach beyond its effect on physical, social and mental well-being.

Keywords

Cigarette Smoking, Quality of Life, Physical Health, Mental Health, Well-Being

1. Introduction

It has been well-established that cigarette smoking is a causative factor in a range of negative physical health outcomes including cancers, cardiovascular and pulmonary disease [1]. Smoking is also associated with mental health conditions such as depression and anxiety [2]. Indeed, recent research has suggested that smoking

plays a key role in increasing the risk of developing mental health issues over time, although the specific mechanisms of this association remain unclear [3]. Additionally, it has been suggested that cigarette smoking may be associated with lower levels of social support, and social isolation as smokers age [4] [5]. Conversely, smokers with strong social relationships and support are more likely to make successful cessation attempts [6].

Although overall smoking rates have decreased to record-low levels in the United States, from a high of 45% in 1954 to 11.5% in 2021 [7], there remain important disparities, including differences by race, ethnicity, gender, and sexual orientation. Thus, there remains a great need to understand the factors associated with smoking behaviors and outcomes to best tailor prevention and interventions to the individuals who suffer most from negative tobacco-related outcomes.

Over the last 25 years, there have been increasing calls to reflect on the quality of life when assessing the outcomes associated with risk behaviors, disease, and healthcare treatments and interventions. It has been stressed that the impact on the quality of life should be considered by both patients and healthcare professionals when making decisions about lifestyle changes, medications, interventions, or treatments, as such approaches may have a significant influence on physical and mental health as well as social wellbeing [8] [9]. Indeed, quality of life has been associated with increased survival even among advanced-stage cancer patients [10].

Three key elements of quality of life are physical health, mental health, and social well-being [11]. Given that cigarette smokers tend to have lower levels of social well-being and poorer physical and mental health, the present study sought to specifically examine the relation between these factors and overall quality of life between smokers and non-smokers. Examining how smoking might affect the overall quality of life, either as mediated by social well-being, physical or mental health, or independently of these factors, could be informative for interventions that might target improvement in any of these areas to improve smoking cessation rates and ultimately quality of life.

2. Methods

2.1. Data Source

Data were collected as part of Wave 5 of the Population Assessment of Tobacco and Health (PATH) study. PATH is a longitudinal, nationally representative study of tobacco use, exposure, attitudes, and health outcomes among youth and adult populations in the United States. Full details on the methods utilized in the PATH study, including sampling and data collection are detailed elsewhere [12]. Data were collected between 2018 and 2019 and included 34,309 adults aged 18 and over. The present study is exempt by the Institutional Review Board at the Pennsylvania State University.

2.2. Measures

Demographics. All participants responded to questions about age, race, education

level, and household income. Each of these variables has been associated with a range of health outcomes and cigarette smoking.

Smoking status. Participants were categorized as current smokers if they had smoked more than 100 cigarettes in their lifetime and currently smoked every day or some days.

Perceived Physical Health. Participants rated their perceptions of their physical health by responding to the item: "*In general, how would you rate your physical health*?" Responses were provided on a five-point Likert scale ranging from 1 = Excellent to 5 = Poor.

Perceived Mental Health. Participants rated self-perceived mental health by responding to the item "*In general, how would you rate your mental health, which includes stress, depression, and problems with emotions*?" Responses were provided on a five-point Likert scale ranging from 1 = Excellent to 5 = Poor.

Perceived Social Satisfaction. To assess social and relationship satisfaction, participants were asked "*In general, how satisfied are you with your social activities and relationships*?" Responses were provided on a five-point Likert scale ranging from 1 = Extremely Satisfied to 5 = Not at All Satisfied.

Overall Quality of Life. Participants were asked "*In general, would you say your quality of life is…*" with responses ranging from 1 = Excellent to 5 = poor.

2.3. Data Analysis

Standard descriptive, independent samples *t*-tests were conducted using SPSS Software, Version 27 (IBM, 2020). Ordinary least squares regression path models and interactions were conducted using the PROCESS modeling tool [13].

3. Results

3.1. Sample Descriptives

The total sample was 48.9% male, 51% female, 68.6% white, 16.5% black, and 11.5% of another race. Overall, 25% were current smokers and 74.9%. Current smokers were more likely to be older, white, and have lower education and lower levels of household income, see Table 1 for descriptive statistics. Additionally, smokers rated their perceptions of mental health, $t(34{,}170) = 28.77$, $p < 0.001$, physical health, $t(34{,}177) = 42.27$, $p < 0.001$, social satisfaction, $t(34{,}176) = 25.71$, $p < 0.001$, and quality of life, $t(34{,}222) = 46.42$, $p < 0.001$, as worse than non-smokers.

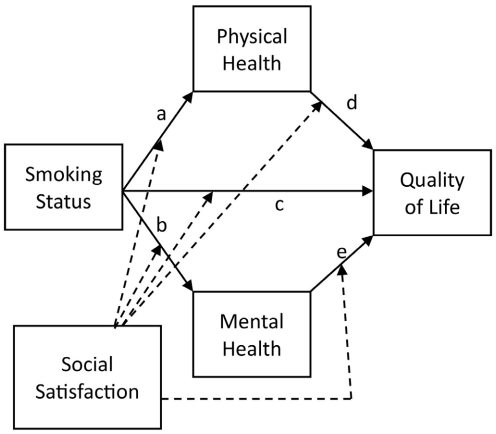
3.2. Smoking and Quality of Life

We sought to examine how perceptions of mental health, physical health and social satisfaction may be associated with quality of life between smokers and non-smokers, controlling for a range of socio-demographic variables using Conditional Process Analysis approaches [13]. Conditional Process Analyses in this context can help achieve a more direct understanding of how perceptions of health may mediate the association between smoking status and quality of life while controlling for socio-demographic variables. Given previous evidence that social

satisfaction and support may serve as a moderator between risk factors and mental health [14]-[16], and between mental health and quality of life [17], social satisfaction was included in the models as a moderator of the associations between smoking status, physical and mental health, and quality of life, see **Figure 1**.

Table 1. Sample descriptive statistics.

	Smoker (%)	Non-Smoker (%)	
Age in Years			$\chi^2(5, 34{,}283) = 2637$, $p < 0.001$
18 - 24	13.7	41.8	
25 - 34	26.3	20.0	
35 - 44	18.2	10.8	
45 - 54	16.6	8.9	
55 - 64	17.0	8.8	
65+	8.3	9.8	
Race			$\chi^2(2, 33{,}136) = 37.66$, $p < 0.001$
White Only	71.4	67.7	
Black Only	17.0	16.3	
Other	9.9	12.0	
Education			$\chi^2(4, 34{,}139) = 1833$, $p < 0.001$
Less than High School	17.8	9.9	
GED	12.3	3.9	
High School Graduate	26.1	24.4	
Some colleges(no degree) or associate degree	33.1	35.9	
Bachelor's degree or advanced degree	10.0	25.6	
Income			$\chi^2(4, 32{,}141) = 1283$, $p < 0.001$
Less than $10,000	21.3	13.4	
$10,000 - $24,999	25.3	16.3	
$25,000 - $49,999	23.8	20.5	
$50,000 - $99,999	17.8	23.2	
$100,000 or more	7.0	19.9	
Gender			
Male	48.8	48.9	
Female	51.1	51	
	Mean (SD)	Mean (SD)	
Mental Health	2.81 (1.16)	2.40 (1.13)	$t(34{,}170) = 28.77$, $p < 0.001$
Physical Health	2.81 (1.03)	2.28 (0.99)	$t(34{,}177) = 42.27$, $p < 0.001$
Social Satisfaction	2.57 (1.11)	2.22 (0.99)	$t(34{,}176) = 25.71$, $p < 0.001$
Quality of Life	2.68 (0.96)	2.13 (0.91)	$t(34{,}222) = 46.42$, $p < 0.001$



Note: Dashed lines indicate moderation.

Figure 1. PROCESS analysis diagram.

The final model depicted in Figure 1 was significant, $R^2 = 0.53$ (11, 30,870) = 3221.27, $p < 0.001$). Results demonstrated that current smokers had lower perceptions of physical health (Path "A" in Figure 1), $b = -0.35$, $p < 0.001$, lower perceptions of mental health (Path "B" in Figure 1), $b = -0.16$, $p < 0.001$, and lower quality of life (Path "C" in Figure 1), $b = -0.16$, $p < 0.001$. Both perceptions of physical health (Path "D" in Figure 1), $b = 0.22$, $p < 0.001$, and perceptions of mental health (Path "E" in Figure 1), $b = 0.19$, $p < 0.001$, were associated with quality of life. Social satisfaction significantly moderated the relation between smoking status and perceived physical health, $F(1, 30,857) = 6.68$, $p = 0.01$ such that smokers with higher social satisfaction reported better perceptions of physical health. Likewise, social satisfaction moderated the relation between smoking status and perceived mental health, $F(1, 30,872) = 12.23$, $p < 0.001$ reflecting that smokers with higher social satisfaction reported better perceptions of mental health. However, social satisfaction did not moderate the direct relation between smoking status and quality of life, $F(1, 30,870) = 0.02$, $p = 0.90$. See Table 2 for full results of the PROCESS analyses.

Table 2. Results of PROCESS analyses.

	Physical Health				Mental Health				Quality of Life			
	b	s.e.	t	*p*	b	s.e.	t	*p*	b	s.e.	t	*p*
Smoking Status												
Path "A"	−0.34	0.029	−11.60	0.000								
Path "B"					−0.16	0.029	−5.54	0.000				
Path "C"									−0.15	0.022	−7.14	0.000
Age	0.10	0.003	32.00	0.000	−0.11	0.003	−34.83	0.000	0.04	0.002	15.06	0.000
Race	−0.02	0.008	−2.27	0.023	−0.05	0.007	−7.44	0.000	0.03	0.005	6.16	0.000
Education	−0.06	0.004	−12.60	0.000	0.003	0.004	0.68	0.490	−0.05	0.003	−13.63	0.000
Income	−0.06	0.004	−13.63	0.000	−0.03	0.004	−6.71	0.000	−0.06	0.003	−18.21	0.000
Physical Health												
Path "D"									0.22	0.01	20.17	0.000
Mental Health												
Path "E"									0.18	0.009	19.00	0.000

4. Discussion

Previous research has established the relation between smoking and physical health. Smoking is directly related to a range of diseases and disabilities, all of which may affect perceptions of physical health. Even beyond cancers and chronic disease, smoking is related to poor oxygen flow and circulation which may result in feelings of fatigue, muscle soreness, inflexibility, and low energy [18]-[20]. Such consequences of smoking may contribute to the association between smoking and perceptions of physical health found in previous studies and confirmed in the present study. Similarly, the relation between smoking and mental health has been well-established in the literature. Not only are smokers more likely to suffer from symptoms of depression, anxiety, and psychological distress than non-smokers, but there is a dose-response relation in which smokers who are more addicted tend to have even higher levels of negative health symptoms [21]. Although the direct mechanisms of the relation between smoking and mental health are not clear, smoking is associated with factors that may contribute to poor mental health. For example, there is an association between smoking and poor sleep quality and quantity [22] [23], and poor sleep quality is a significant factor associated with the experience of negative mental health symptoms [24]. The present study reflected these findings through the association between smoking and perceptions of mental health.

Satisfaction with social interactions and support not only benefits mental health, it may also have direct impacts on physical health. For example, social satisfaction may affect the noradrenergic system, the hypothalamic-pituitary-adrenocortical (HPA) system, and central oxytocin pathways which can provide resilience to stressors and benefit physical health outcomes [15]. Consistent with these findings, the present study demonstrated that social satisfaction did moderate the relation between smoking and both physical and mental health. However, social satisfaction did not moderate the relation between smoking and quality of life.

Quality of life is a critical construct when considering approaches to health treatment, intervention and the outcomes associated with health risk behaviors such as smoking. Quality of life is often defined as a global sense of well-being that includes physical and mental health, education, income, and social well-being [25]. The present study demonstrated significant relationships between education, income, physical and mental health and quality of life. Despite the indirect associations between smoking and quality of life partially mediated through mental and physical health, and controlling for demographic variables, there remained an independent, direct association between smoking and quality of life, with smokers having a significantly lower quality of life compared to non-smokers. The fact that smoking has a direct effect on quality of life, even when controlling for physical and mental health and key demographic variables, suggests smoking behaviors or other related outcomes are associated with some unique mechanisms that directly affect quality of life. It is possible that there are financial, social, or health-related consequences of smoking that were not measured in the present

study that may help elucidate this direct relationship. Future research needs to examine other potential mechanisms that can account for this direct association. Understanding how smoking directly impacts quality of life may provide data that can be used to improve cessation motivation, interventions, and prevention programs.

Limitations

The results of this study should be interpreted considering its limitations. The cross-sectional nature of the data limits the ability to make causal inferences. Although models in the present study offer plausible temporal pathways and associations supported in part by previous literature, these pathways may be reversed, exist concurrently, or otherwise are not sustained in longitudinal models. Further longitudinal research could verify these associations are temporally valid. The models in the current study may also exclude relevant measures that may be associated with quality of life, such as spiritual well-being, work satisfaction, or environmental factors such as housing or personal safety. Future studies may work to develop additional measures of quality of life that will help provide a more robust picture of the associations between smoking and quality of life.

Despite these limitations, the present study highlights the need to continue to develop an understanding of the global negative impacts associated with smoking. Specifically, the findings that smoking is associated with quality of life, independently of its impacts on physical and mental health, suggested the negative impacts associated with smoking are broad and perhaps even more wide-ranging than previously believed.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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