Original Article

Impact of nicotine dependence on self-efficacy and readiness to quit among tobacco consumers in rural areas

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Abstract

Aim and Objectives: The aim of the present study was to determine the impact or effect of nicotine dependence on self-efficacy and readiness to quit. **Materials and Method:** The current study was performed using a cross-sectional descriptive questionnaire design among tobacco users visiting primary health care facilities in the rural Jaipur district. Jaipur district is divided into four directions: east, west, north, and south. From each direction, two PHCs were selected randomly based on suitable accessibility to patients. Sample size of study is 465. Out of 465 tobacco consumers, 238 were consuming a smoked form of tobacco, and 227 study participants were consuming a smokeless form of tobacco. **Results:** It was observed that the majority of study participants (145 (31%)) need smoke/smokeless tobacco within 5 minutes of waking up. With regards to internal stimuli, the majority of study participants (179 (38%)) and (203 (44%)) were not very sure that they would refrain from smoking when they were nervous and depressed. It was determined that quitting tobacco products was not at all important for 159 (34%) study participants. In regards to confidence in tobacco product quitting, only 79 (16%) of tobacco consumers were extremely confident. **Conclusion:** It was concluded that nicotine dependence impacts both self-efficacy and readiness to quit. It was determined that the higher the nicotine dependence, the less self-efficacy and the less would be the readiness to quit.

Keywords: Dependency, nicotine, self-efficacy, tobacco

Introduction

Smoking increases adult mortality, especially in low- and middle-income countries where the burden of tobacco-related illness and death is highest. 9.5% of all fatalities in India are caused by tobacco use, which results in more than 1 million adult deaths each year.[1]

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There is no safe level of cigarette exposure; using tobacco products is harmful in any amount. Cigarette smoking is the most common way to consume tobacco in the world. Bidis and kreteks, heated tobacco, roll-your-own tobacco, pipe tobacco, cigars, cigarillos, and waterpipe tobacco are some other tobacco products.[2]

A dependency on nicotine is referred to as nicotine dependence.[3] Nicotine dependency is a long-term, recurrent condition characterized by an obsessional need to use the substance despite negative social repercussions, a lack of control over drug use, and the onset of withdrawal symptoms.[4] Another

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aspect of drug dependence is tolerance. As a person continues to use nicotine, a reliance on it grows over time.[5]

Tobacco products, including cigarettes, are addictive. Most smokers smoke frequently because they are nicotine addicts. Furthermore, nicotine addiction makes it challenging for most smokers to stop smoking cigarettes. The first few years of cigarette smoking, or for the majority of individuals, youth or early adulthood, are when nicotine addiction begins to take hold. The majority of smokers start while they are young or in adolescence: 71% of those who have ever smoked daily started doing so by the age of 18, while 89% of daily smokers tried their first cigarette by or at that age. A child's likelihood of becoming a regular smoker (one who smokes once a month or more regularly) or a daily smoker increases with the sooner in life they use cigarettes. For instance, 46% of teens who start smoking in their eleventh grade go on to become regular adult smokers, while 67% of youngsters who start smoking in the sixth grade do the same.[6]

Tobacco consumption and nicotine dependence in rural areas in India are affected by various factors. Various factors such as low literacy rate, very little knowledge about tobacco de-addiction centers, and disproportionate use of tobacco may lead to high nicotine dependence.[3] Some other and not-so-common researched factors are self-efficacy and readiness to quit.

Self-efficacy is a significant psychological characteristic that has been linked to nicotine dependency. Smokers' self-efficacy can be seen as a key component in the conversion to healthy behavior since they believe they have control over their smoking behavior.[7,8] In a study by Hanqiao Ma *et al.*,[9] it was hypothesized that, on the one hand, the use of negative coping styles could increase nicotine dependence and, on the other hand, that they can decrease the self-efficacy of quitting smoking and, consequently, increase nicotine dependence.

The ability to stop is another element that demonstrates a connection between nicotine dependency. Numerous studies have shown that nicotine dependency was linked to teenage readiness and capacity to stop smoking.[10]

Besides all research, a large research gap exists, and very few studies in India have been conducted to assess the impact of nicotine dependence on self-efficacy and readiness to quit among tobacco consumers especially in rural areas. Therefore, the current study's goal was to ascertain how nicotine dependency affected preparedness and self-efficacy for quitting.

Materials and Methods

The current study was performed using a cross-sectional descriptive questionnaire design on tobacco consumers coming to primary health centers in rural areas of the Jaipur district. The study was conducted from January to July 2023. The necessary permission to carry out the study was obtained from the CMHO office. The participants were also informed about the purpose of the study, and written informed consent was obtained from them before the study was implemented. Ethical Clearance was obtained before the start of the study from the Institutional Review board.

The primary health centers (PHCs) are primarily in charge of offering both curative and preventive healthcare in rural areas. In addition to standard in-patient and out-patient treatments, this also involves the provision of reproductive and child health services, such as prenatal care and vaccination. Because one PHC is planned to serve 20,000–30,000 people, a greater population can access PHCs.[11] Jaipur district is situated in the eastern part of Rajasthan. There are about 81 PHCs in the Jaipur district.[12] Out of this, 21 PHCs are situated in rural areas of Jaipur district; Jaipur district is divided into four directions that is east, west, north, and south; from each direction, two PHCs were selected randomly based on suitable accessibility to patients. Written permission was obtained from the chief medical officers of all eight PHCs, and those given permission were included in the study. Tobacco consumers consuming at least one unit of both smoked and smokeless form of tobacco per day were part of the study. The present study was conducted among 465 tobacco consumers from eight PHCs. The sample size was calculated using the formula $N = Z^2_{1-\alpha/2} p\ (1 - p)/d^2$. N = Sample size, $1-\alpha$ = confidence level, $Z1-\alpha/2$ = Represent the number of standard errors from the mean ($z1-\alpha/2$ is the function of confidence level). Out of 465 tobacco consumers, 238 were consuming a smoke form of tobacco, and 227 study participants were consuming a smokeless form of tobacco

Before the main survey, a pilot survey was carried out among 10% of study participants to assess the reliability and validity of the questionnaire. By utilizing Test-Retest and the values of measured Kappa (k) =0.81, weighted Kappa (kw) =0.86, the reliability of the questionnaire was assessed. By using Cronbach's alpha (α), the internal consistency of questionnaires was evaluated, and a value of α =0.91 was determined.

A closed-ended interview schedule was created for the current study to assess participants' readiness to stop, self-efficacy, and reliance on nicotine. There are four components to it. The first section contains information about the patient's demographics, including their age, which was broken down into two groups ranging from 25 to 45 years old, or 25 to 35 years and 36 to 45 years. Gender was divided into male and female; socioeconomic status was measured by the revised BG Prasad socioeconomic status scale (updated for January 2021), which divides socioeconomic status into five categories that are upper class, upper middle class, middle class, lower middle class, and lower class on the basis of per capita monthly income.[13] The second part consists of nicotine dependence, which was measured by the Fagerstrom Test for Nicotine Dependence (FTND).[14] In the present study, FTND was modified to assess nicotine dependence for both smoke and smokeless tobacco consumers. The questionnaire consists of

eight items. The overall score for the FTND ranges from 0 to 14, and it was divided into a three-point scale that is 10–14 points = minimally dependent = 3; 6–9 points = moderately dependent = 2; 0–5 points = highly dependent = 1. The third part consists of 12-item questionnaires (SEQ-12) to measure self-efficacy.[15] The questionnaire for readiness to quit was a 2-item questionnaire.[16] The responses to these questions range from 1 to 10; the higher the score, the more positive the response. It constitutes the fourth part of the questionnaire.

Statistical analysis

The data are analyzed using SPSS version 21.0 after being entered into Microsoft Excel 2014. Descriptive statistics is used to determine demographic details, nicotine dependence, self-efficacy, and readiness to quit. Regression analysis is used to determine the impact of nicotine dependence on self-efficacy and readiness to quit.

Results

Table 1 shows the demographic details of study participants. It was observed that most study participants (271 (58%)) were 25-35 years old. Most of them were males (354 (76%)). Socioeconomic status of the tobacco consumers of most of the study participants (108 (23%)) was upper middle class.

Table 2 shows nicotine dependence among study participants. It was observed that the majority of study participants (145 (31%)) need smoke/smokeless tobacco within 5 minutes of waking up. About 149 (32%) of tobacco consumers sometimes swallow tobacco juice intentionally. 256 (55%) of tobacco consumers consume smoking/smokeless tobacco if they are ill and are in bed most of the day.

Table 3 shows self-efficacy of study participants. With regards to internal stimuli, the majority of study participants {179 (38%)} and {203 (44%)} were not very sure that they would refrain from smoking when they were nervous and depressed. As compared to this, 138 (30%) of study participants {138 (30%)} were more or less sure about refraining from smoking when they thought about a difficult problem. In respect to external stimuli, drinking with friends {209 (45%)} and with smokers {210 (45%)} are the two most common stimuli for which tobacco consumers do not refrain from smoking.

Table 1: Demographic details of the study participants (*n*=465)

Demographic variable	*n* (%)
Age	
25-35 years	271 (58%)
36-45 years	194 (42%)
Total	465 (100)
Gender	
Male	354 (76%)
Female	111 (24%)
Total	465 (100)
Socioeconomic Status	
Upper Class	102 (22%)
Upper Middle Class	108 (23%)
Middle Class	92 (20)
Lower Middle Class	89 (19%)
Lower Class	74 (16%)
Total	465 (100)

Table 2: Nicotine dependence among study participants

Nicotine dependence n (%)	Tobacco consumers
Q1. How soon after you wake up do you take smoke/ smokeless tobacco?	
Within 5 min	145 (31%)
6–30 min	75 (16%)
31–60 min	123 (26%)
After 60 min	122 (27%)
Total	465 (100)
Q2. How often do you intentionally swallow tobacco juice?	
Always	24 (5%)
Sometimes	149 (32%)
Never	54 (12%)
Smoke tobacco consumers	238 (51%)
Total	465 (100)
Q3. Do you find it difficult to refrain from taking smoking/smokeless tobacco in places where it is forbidden (e.g., in church, at the library, or in cinema)?	
Yes	312 (67%)
No	153 (33%)
Total	465 (100)
Q4. Which smoking/smokeless tobacco would you hate to give up most?	
The first one in the morning	301 (65%)
Any other	164 (35%)
Total	465 (100)
Q5. How many cigarettes/day do you smoke?	
31 or more	80 (17%)
21–30	46 (10%)
11–20	87 (19%)
10 or less	25 (5%)
Smokeless tobacco consumers	227 (49%)
Total	465 (100)
Q6. How many cans/pouches per week do you use?	
>3	56 (12%)
2–3	123 (26%)
1	48 (11%)
Smoke tobacco consumers	238 (51%)
Total	465 (100)
Q7. Do you take smoking/smokeless tobacco frequently during the first hours after awakening than during the rest of the day?	
Yes	314 (68%)
No	151 (32%)
Total	465 (100)
Q8. Do you take smoking/smokeless tobacco if you are so ill that you are in bed most of the day?	
Yes	256 (55%)
No	209 (45%)
Total	465 (100)

Table 4 shows the readiness to quit among tobacco consumers. It was determined that quitting tobacco products was not at all important for 159 (34%) study participants. In regards to confidence in tobacco product quitting, only 79 (16%) of tobacco consumers were extremely confident. In contrast, about 178 (38%) of the study participants were not at all confident of quitting tobacco.

Table 5 shows that nicotine dependence of the majority of study participants {203 (44%)} were highly dependent. Self-efficacy of 243 (52%) of the study participants was low, and low readiness to quit was prevalent among 298 (64%) tobacco consumers. Only 21 (5%) of study participants were highly ready to quit.

Table 6 shows the impact of tobacco addiction on self-efficacy and readiness to quit. It was observed that self-efficacy was significantly higher ($P = 0.01$*) among minimally dependent tobacco consumers. While significantly ($P = 0.00$*) lower scores of readiness to quit were observed among highly dependent tobacco consumers. While among minimally dependent tobacco consumers, significantly ($P = 0.00$*) higher scores of readiness to quit were observed.

Discussion

The goal of the current study was to ascertain how nicotine dependency affected self-efficacy and readiness to quit in rural areas of the Jaipur district. The majority of the participants in this cross-sectional study were males between the ages of 25 and 35, and the majority of tobacco users were from the upper middle class. Research by Gaur *et al.*[17] found that men aged 36 to 47 made up the bulk of study participants. This might be a result of the higher incidence of tobacco use among men in rural regions.[18]

Regarding nicotine dependency, the majority of the study participants in this study need cigarettes within five minutes of waking up, and they occasionally purposefully consume the juice from tobacco products. Even when they are unwell and confined to beds, the majority of them would still prefer to smoke. In contrast, the majority of the research participants in a study by Gaur *et al.*[17] needed to smoke between 31 and 60 minutes after awakening. The individuals in this research occasionally ingest tobacco juice; however, the majority abstain due to illness or being bedridden. This could be because the participants in the

Table 3: Self-efficacy of study participants (*n*=465)

The following are some situations in which certain people might be tempted to smoke. Please indicate whether you are sure that you could refrain from smoking in each situation	Not at all sure *n* (%)	Not very sure *n* (%)	More or less sure *n* (%)	Fairly sure *n* (%)	Absolutely sure *n* (%)	Total *n* (%)
Internal stimuli						
When I feel nervous	134 (29%)	179 (38%)	56 (12%)	51 (11%)	45 (10%)	465 (100)
When I feel depressed	168 (36%)	203 (44%)	49 (11%)	34 (7%)	11 (2%)	465 (100)
When I am angry	99 (21%)	78 (17%)	139 (30%)	82 (18%)	67 (14%)	465 (100)
When I feel very anxious	126 (27%)	101 (22%)	101 (22%)	77 (17%)	60 (12%)	465 (100)
When I want to think about a difficult problem	57 (12%)	89 (19%)	138 (30%)	102 (22%)	79 (17%)	465 (100)
When I feel the urge to smoke	178 (38%)	136 (29%)	71 (15%)	48 (10%)	32 (8%)	465 (100)
External stimuli						
When having a drink with friends	209 (45%)	156 (34%)	47 (10%)	22 (5%)	31 (6%)	465 (100)
When celebrating something	165 (35%)	137 (29%)	87 (19%)	56 (12%)	20 (5%)	465 (100)
When drinking beer, wine or other spirits	171 (37%)	142 (30%)	75 (16%)	63 (13%)	14 (3%)	465 (100)
When I am with smokers	210 (45%)	201 (43%)	23 (5%)	19 (4%)	12 (3%)	465 (100)
After a meal	78 (17%)	107 (23%)	176 (38%)	83 (18%)	21 (4%)	465 (100)
When having coffee or tea	34 (7%)	56 (12%)	213 (46%)	95 (20%)	67 (15%)	465 (100)

Table 4: Readiness to quit among study participants (*n*=465)

Importance:

How important would you say it is for you to quit using tobacco products, including e-cigarettes and vaping devices? On a scale from 0-10, where 0 is not at all important and 10 is extremely important, where would you say you are?

0	1	2	3	4	5	6	7	8	9	10	Total
Not at all important *n* (%)			**Somewhat important *n* (%)**			**Very important *n* (%)**		**Extremely important *n* (%)**			
159 (34%)			132 (28%)			89 (20%)		85 (18%)			465 (100%)

Confidence:

And how confident would you say you are that if you decided to quit using tobacco products including e-cigarettes and vaping devices, you could do it? On the same scale from 0 to 10, where 0 is not at all confident and 10 is extremely confident, where would you say you are?

0	1	2	3	4	5	6	7	8	9	10	Total
Not at all confident *n* (%)			**Somewhat confident *n* (%)**			**Very confident *n* (%)**		**Extremely confident *n* (%)**			
178 (38%)			118 (25%)			100 (21%)		79 (16%)			465 (100%)

Table 5: Nicotine dependence, self-efficacy, and readiness to quit among study participants

	n (%)
Nicotine dependence	
Minimally dependent	79 (17%)
Moderately dependent	183 (39%)
Highly dependent	203 (44%)
Total	465 (100)
Self-efficacy	
High self-efficacy	28 (6%)
Medium self-efficacy	194 (42%)
Low Self-efficacy	243 (52%)
Total	465 (100)
Readiness to quit	
High	21 (5%)
Medium	146 (31%)
Low	298 (64%)
Total	465 (100)

current study were members of the general population from rural regions who had less knowledge of poor tobacco habits than medical professionals.

In the current investigation, patients with low cigarette dependency scores had considerably high self-efficacy ratings. The same outcomes were found in the study by Gaur *et al.*[17] The same findings were shown in a research by Shinkre R *et al.*,[19] which found a statistically significant correlation between respondents' high levels of nicotine dependency and low self-efficacy.

The closeness to smokers and the impulse to smoke, followed by depressive feelings, were shown to be the most frequent causes of smoking in the current study. In contrast to this, the most frequent cause for quitting in research by Prokhorov AV *et al.*[20] was the impulse to smoke, followed by "irritability or anger."

In the current study, smokers who were heavily dependent on tobacco showed substantially lower levels of ready-to-quit ($P = 0.00$*). Similar findings were found in research by Lin H *et al.*,[21] Deolia SG *et al.*[22] and Chhabra C *et al.*[23] which found a higher connection between the low-dependence group's behavior and quitting intention.

The current study has limitations that should be considered when interpreting the results, as the fact that it was performed in rural settings may restrict its applicability to populations living in urban or suburban areas. Findings from rural settings may not apply to a broader population, which limits the external validity of the study. Then there could be Selection Bias like if the study relies on self-reporting or convenience sampling, it may not accurately represent all tobacco consumers in rural areas, potentially leading to a biased sample. The measurement of self-efficacy can be challenging. Self-efficacy is often assessed through self-report questionnaires, which may not capture the full range of factors influencing an individual's confidence in quitting tobacco.

Table 6: Impact of Nicotine addiction on self-efficacy and readiness to quit among study participants

Tobacco addiction	Self-efficacy						Readiness to quit					
	High	*P*	Medium	*P*	Low	*P*	High	*P*	Medium	*P*	Low	*P*
	Exp (*B*) 95% CI		Exp (*B*) 95% CI		Exp (*B*) 95% CI		Exp (*B*) 95% CI		Exp (*B*) 95% CI		Exp (*B*) 95% CI	
Minimally dependent	1.411 (0.815-2.758)	0.01*	0.964 (0.391-3.123)	0.88	0.459 (0.377-7.831)	0.23	5.449 (1.894-7.455)	0.00*	0.984 (0.219-7.485)	0.11	0.194 (6.721-58.841)	0.21
Moderately dependent	2.123 (1.684-3.411)	0.02*	0.144 (0.385-2.517)	0.47	0.179 (0.332-1.563)	0.09	3.556 (2.214-5.245)	0.03*	1.955 (0.149-6.322)	0.56	0.831 (0.331-2.455)	0.29
Highly dependent	0.621 (0.344-1.598)	0.98	0.725 (0.444-1.889)	0.12	0.514 (0.401-2.448)	0.00*	9.411 (2.919-11.618)	0.94	1.338 (1.241-4.195)	0.02*	0.564 (0.163-4.317)	0.00*

$P \leq 0.05$

Conclusion

From above, it was concluded that, nicotine dependence impacts both self-efficacy and readiness to quit. It was determined that higher the nicotine dependence less will be self-efficacy and less will be the readiness to quit. Proximity to smokers and urge to smoke are the most important reasons that decrease the self-efficacy of a tobacco consumer, therefore decrease the readiness to quit.

More and more studies are needed in this field to be conducted and especially longitudinal studies to assess the impact of time on nicotine dependence and other factors.

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Conflicts of interest

There are no conflicts of interest.

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