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Prediction of the Tendency to Smoke Based on Emotional Dyslexia and Cognitive Control

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ABSTRACT

Background: Smoking is a serious health threat, killing about 5 million people worldwide each year. By 2030, the number of diseases and deaths from tobacco use will reach 8 million per year. This study aims to investigate the prediction of smoking tendency based on emotional dyslexia and perceptual control with the mediation of risk perception.

Method: This was a descriptive-correlational research conducted on all the 45,000 employees of Tehran Municipality who were working in 2019. The statistical sample consisted of 215 members of the aforementioned statistical population, which was determined using the usual sampling method in correlation studies and the multi-stage cluster sampling method. The instruments used included the smoking tendency questionnaire, the emotional nonverbal questionnaire, and the perceptual control questionnaire. The collected data were analyzed using SPSS software version 25 and Amos software version 22 at two descriptive (mean, standard deviation, etc.) and inferential (structural equation analysis) levels.

Results: The coefficient of the direct path between alexithymia and the tendency to smoke was 0.380. It can be concluded that there was a positive and significant relationship between alexithymia and the tendency to smoke. In addition, the coefficient of the direct path between perceptual control and the tendency to smoke was -0.250.

Conclusion: There is a negative and significant relationship between cognitive control and the tendency to smoke. Therefore, by teaching people emotional regulation skills, a person can be prepared to face and solve problems and have constructive relationship with others.

Keywords: Emotional Dyslexia, Cognitive Control, Tendency to Smoke

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Introduction

The tendency to smoke is an instinctive activity with a distinctive behavioral pattern which results in several negative effects and problems (1, 2). It is the biggest preventable health risk, killing millions of people annually throughout the world (3). Recent research has proven that smoking tobacco contributes to several illnesses including fibrosis and emphysema of the lungs because it contains toxic metals like potassium, nickel, and cadmium (4). Additionally, smoking-related deaths have resulted in significant cardiovascular and respiratory diseases across the world (5). In addition, young people make up a significant part of this number, such that in the report on the study of smoking in most countries, 19% of all the smokers were under the age of 25. For instance, the majority of smokers in a culture like the United States are young people (7). Nearly one-third of the adult population of the world (1.1 billion people) smoke (6). Generally, smoking is more popular than alternative ways of nicotine withdrawal due to the rapid absorption of nicotine into the blood and brain (8), especially among young people (9).

One of the elements connected to the tendency to smoke is emotional dyslexia. It restricts access to emotional information and heightens the tendency for harmful activities, such as smoking (10). Limited visualization capability, which is the inability to discern between emotions and physiological arousal associated with emotional arousal, is one aspect of emotional dyslexia. Other aspects include the trouble of explaining and identifying emotions (11). People with emotional dyslexia may exhibit poorly controlled emotions as a result of over-arousal brought on by problems with emotion recognition, expression, modulation, or response. As a result, the capacity for flexibility in the face of adverse life experiences and the degree of emotional dyslexia are inversely related (12).

The perceptual control hypothesis, on the other hand, contends that action regulates perception, and people react to environmental disruptions to coordinate their perceptions of themselves and their surroundings in a hierarchical fashion with the relevant neuronal reference values (13). According to perceptual control theory, deliberate "reference" states regulate hierarchical negative feedback control over perceptual inputs (14). People continue to firmly believe that they can affect events and have control over them; this is while the collected data shows that humans have little or no capacity to control the events, since their environment is more predictable for them when they believe they have such control. The results of this research demonstrated that people overestimate their capacity for control and prediction to some extent, and their behavior is affected by this overconfidence. Accordingly, low levels of self-care are found among those with a high sense of control over events and a belief that they can predict and control them. These individuals are also more prone to participate in harmful behaviors like smoking (15).

The protection motivation theory postulates that the perception of risk is substantially influenced by people's intentions to take protective actions. Accordingly, people’s perception of risk depends on how serious and vulnerable they perceive a given health danger would be. Risk perception is the identification of the subjective assessment of the features and severity of the risk at an individual level. If people do not see their health at risk, the result will be poor risk perception and failure to recognize early warning signals (16). To prevent any harm, the underlying and strengthening elements must be first recognized and addressed under the aforementioned materials, given that tendency to smoke might be the starting point for drug abuse in individuals. Considering perceptual control with the mediation of risk, perception has not been studied regarding prediction of the tendency to smoke based on emotional dyslexia; the effect of such factors on the tendency to smoke has not been examined concurrently through a model, and the gap in the current research is noticeable. The aim of this research is whether or not the model the researcher created is appropriate for predicting the tendency to smoke based on emotional dyslexia and perceptual control with the mediation of risk perception

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Method

Statistical population, sample, and sampling method

This wasa descriptive_correlational study with a modelingtype approach. The 45,000 employees of Tehran municipality working in 2019 comprised the statistical population. Considering the possibility of shedding the sample, the link of questionnaires was provided to 250 municipal employees, but only 215 employees fully answered, and the analysis of hypotheses was based on the same number. The material collected was examined and analyzed using a multi-stage random cluster sampling procedure. The statistical data analysis was carried out by SPSS version 25 and Amos software version 22.

Tools

Smoking tendency questionnaire was developed by Shure et al. (17). The questionnaire consisted of 17 questionswhich evaluates people's attitudes regarding smoking from a variety of perspectives (relationship with the smoker, a smoke-free and healthy environment, limitations and prohibitions on smoking, and the sale of cigarettes). Through a scale of 1 to 5, the subjects rank their responses for each item, and some questions are graded in reverse. The scale's score can range from 1 to 85. It was carried out by Shure et al. (17) on two samples of American undergraduates (N = 558), who were either smokers or non-smokers. The exploratory and confirmatory factor analysis with Lisrel software indicated that internal consistency of the attitude regarding the tendency to smoke was 0.90 in smoking subjects and 0.88, 0.80, 0.70 and 0.69 for the first to fourth factors. In addition, for non-smokers ,it was 0.89 and for the first to fourth factors, 0.93, 0.72, 0.72 and 0.83 for the first to fourth factors, respectively.

Questionnaire of cognitive evaluation of high-risk incidents: Fromm, Katz, and Viot (18) used this questionnaire to evaluate how young adults perceive the risks and rewards of participating in high-risk activities. This questionnaire is scored on a 7-point Likert scale, and consists of 30 questions. Cronbach's alpha coefficients of the subscales in each scale mentioned above were 0.64 for high-risk sports and 0.88 for occupational and academic behaviors. The subscales of this test were calculated as 0.68 for high-risk sexual activities and 0.93 for occupational and academic behaviors (19).

The Toronto Emotional Dyslexia Scale (20) is a 20-question test and three subscales measure difficulty in identifying emotions, difficulty in describing emotions, and objective thinking on a 5-point Likert scales from 1 (completely disagree) to 5 (completely agree). The total score is obtained from the sum of the scores of the three subscales for general emotional dyslexia. The minimum and maximum scores are 20 and 100, respectively. In the Farsi version of "Toronto Ataxia Scale", Cronbach's alpha coefficients were calculated for total emotional dyslexia and three subscales of difficulty in identifying emotions, difficulty in describing emotions, and objective thinking as 0.85, 0.82, 0.75, and 0.72 respectively, which is a good sign of internal consistency of the scale (21). The test-retest reliability of the Toronto-20 emotional dyslexia scale was confirmed by a sample of 67 people in two shifts with an interval of four weeks from r = 0.80 to r = 0.87 regarding the total emotional dyslexia and different subscales.

Perceptual control questionnaire was developed by Tetrick and LaRocco to measure perceived control. There are 6 questions in this tool based on a 5-point Likert scale, from not at all scored 1 to very much scored 5. The minimum and maximum scores are 6 and 30, respectively. According to Qasimzadeh Alishahi, Hasani, and Kazemzadeh (2016), it has a reliability coefficient of 0.85.

Procedures

The researcher first referred to municipalities of the aforementioned districts of Tehran City, clarified the goal of the research, and obtained their administration’s support for collaboration. After outlining the goal of the study, five regions were chosen at random from among the 22 regions of Tehran municipality. Tehran was physically divided into six locations: north, east, west, south, and center. The participants were chosen from the north of Tehran, region 1, district 3, from the east, region 4, region 2, from the west, region 5, from the south, region 20, region 17, and from the center, region 7,

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and region 4. The questionnaire links were distributed randomly to 49 individuals—to a total of 215 employees of that center—in each district. The subjects were contacted at the time of implementation after their contact information was gathered from the municipalities' recruiting units in collaboration with the recruitment units of the selected municipalities. The questionnaires were completed online, and their link (https://form.avalform.com/view.phd?id=1324721) was sent to the subjects through an SMS to ensure that their health was not jeopardized by the researcher and the subjects' absence from a specific location due to the outbreak of COVID-19 pandemic, the daily absence of employees, and the researcher's remote work environment. The participants received assurance over the phone that the information would be confidential. The data were collected over four weeks, and then, they were carefully examined. The structural equation analysis approach was utilized to statistically evaluate the data.

Results

From the 215 employees in Tehran Municipality, 79 (36.7%) were females and 136 (63.3%) were males. Regarding education level, two employees (0.9%) had a high school diploma, three (1.4%), an associate degree, 139 (64.7%), a bachelor's degree, 68 (31.6%), a master's degree, and three (%1/4) had a PhD degree.

Descriptive statistics for the complete sample are presented in Table 1. The statistics of skewness and kurtosis indicated that each variable's data dispersion was distributed normally. The evaluation of all the fit indices demonstrated that the acquired fit indices showed an adequate fit of the data with the conceptual model, and the research model had a relatively good fit. As a result, the fit of the relationship can be relatively validated if the fit indices have an average or satisfactory value (Table 2). Table 3 shows that emotional dyslexia has a significant impact on smoking propensity ($p < 0.05$). It is determined that there is a significant and positive relationship between emotional dyslexia and the tendency to smoke, given that the coefficient of the direct path between emotional dyslexia and the tendency to smoke is 0.380. It is verified that cognitive control has an impact on the tendency to smoke ($p < 0.05$). In addition, there is a significant and negative relationship between perceptual control and the tendency to smoke, given that the coefficient of the direct path between perceptual control and the tendency to smoke is equal to - 0.250.

Statistical analysis

Table 1. Descriptive statistics

Variables	Mean	Standard deviation	Minimum	Maximum
Perceptual control	21.83	4.720	30	10
Emotional dyslexia	55.10	8.635	76	32
Difficulty recognizing emotions	15.08	4.561	27	8
Difficulty describing feelings	13.72	3.099	21	5
Objective thinking	26.31	4.427	35	15
Tendency to smoke	45.62	4.879	59	39
Relationship with a smoker	18.16	3.601	25	12
Smoke-free and healthy environment	13.25	1.910	15	8
Smoking restrictions and rules	5.94	2.093	12	4
Sale cigarettes	8.27	1.538	12	6

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Table 2. Fit indices of the research model

Indicators	Result	Interpretation
GFI	0.944	Good fit
RMSEA	0.061	Good fit
CFI	0.888	Medium fit
NFI	0.954	Good fit
IFI	0.890	Medium fit
AGFI	0.907	Good fit
PGFI	0.576	Good fit
/df Chi-square	4.415	Good fit

Table 3. Test results of the prediction model for smoking tendency based on emotional dyslexia and perceptual control with the mediation of risk perception

Result of hypothesis	Indirect standard coefficient	Direct standardized coefficient of the relationship	Total standard factor	Result of the hypothesis
Ataxia → Tendency to smoke	0.380	0.440 × (0.590) = 0.259	0.639	confirmation
Perceptual control → Tendency to smoke	-0.250	(-0.320) × (0.590) = -0.188	- 0.438	confirmation

Considering that the direct path coefficient between alexithymia and tendency to smoking is 0.380 and the indirect path coefficient between alexithymia and tendency to smoking is 0.259, risk perception adds 25.9% to the path between alexithymia and tendency to smoking. Given that the direct path coefficient between perceptual control and smoking tendencies is -0.250, and the indirect path between perceptual control and tendency to smoking is - 0.188, risk perception reduces the path between perceptual control and tendency to smoking by 18.8%.

Discussion

The objective of the current study was to predict the tendency to smoking using emotional dyslexia and perceptual control. The current study was consistent with studies by Mostafa (26), Fatahi Bojani et al. (24), Karimi et al. (25), Kamkar et al. (22), Kadampour et al. (23), Lee and Vioka (23), and Fatahi Bojani et al (27)., Kazemi Rezaei and Kazemi Rezaei (28) in their study found a positive and significant correlation between nursing students' emotional dyslexia and willingness for addiction. Additionally, Birami et al. (29) demonstrated that alexithymia had a positive and significant impact on addictiveness. Akbari Borang and Salarifar (30) also found that emotional dyslexia and difficulty in recognizing emotions were predictors of the tendency for addiction among students. Moreover, the basic emotional dyslexia, according to Lin et al. (31), had a positive and significant indirect impact on the number of cigarettes smoked at the end of treatment through problems with emotion regulation in their study. Furthermore, Petri and Bonnet's research (32) revealed that smokers had more trouble identifying emotions than non-smokers.

According to the research findings, a further intrapersonal factor of the tendency to smoking is cognitive distortion of smoking and inadequate psychological factors. It is connected to people's ideas about smoking and results in attitudes that lead to justification for smoking, such as relaxing via smoking, viewing smoking as a source of support, and smoking to escape the discomfort of a situation. People become resistant to the negative effects of smoking due to the development of mental and cognitive beliefs (distorted) about smoking. As a result, these thoughts have given rise to false beliefs, such as the idea that smoking is protective and a refuge from sadness and discomfort. Concern for the risks of smoking is also related to these beliefs, which minimizes negative effects of smoking. Several studies in this field were in line with this study regarding another factor contributing to people's tendency to smoke,

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which is having a positive attitude towards smokings for reducing negative emotions (27). In their study, Kalantari and Gholami (33) found a significant inverse relationship between self-control and smoking addiction in students. This was consistent with earlier findings and supports the hypothesis that there is a relationship between cognitive control and the tendency to smoke.

A person who feels highly in control of his activities and intends to show it to the world will almost certainly do so. Perceived empowerment, or the existence or absence of facilitators or barriers to engage in an action determines perceived control. People with an external locus of control feel they have control over the rewards they get. Other people believe in fate or chance because high levels of belief in control about the existence of facilitators for a behavior strengthen one's perception of control over the behavior. In other words, such people think they have no control over outside forces. People with an external locus of control, on the other hand, do not value exerting effort to improve their conditions because they feel that their actions and attitudes have no bearing on the reinforcements they receive. People with an internal locus of control act as though they have total control over their conditions; they also place high importance on their abilities, are perceptive to environmental signs, and are less receptive to others' attempts to influence them. They claim to have better mental and physical health, experience less anxiety, have more self-esteem, and take more accountability for their activities. In this way, it may be concluded that a person's level of perceptual control might influence the behavior he exhibits and provide an explanation for his tendency to smoke (30).

This study had some limitations as well. The surveys were distributed to the individuals via a link owing to COVID-19pandemic. As a result, many of them refused to participate. Another drawback was the use of instruments for self-evaluation and the difficulty of qualitative evaluation, which may introduce biases into the response.

Conclusion

Compared to previous generations, the present generation of young people takes a different route. They will thus confront more significant obstacles when it comes to maintaining their health, necessitating a greater urgency to analyze problems and damages like smoking; The problem is that all the data points to the fact that young people are more prone to turn to cigarettes as the first defence mechanism when faced with even the smallest challenge or crisis in life. Since the findings indicated a significant relationship between emotional dyslexia and the tendency to smoke, it is possible to equip individuals to face problems, find solutions, and form positive relationships with others by teaching them emotional regulation skills. Furthermore, teaching these abilities is a crucial element in quitting smoking. Since the results indicated a significant relationship between cognitive control and the tendency to smoke, it is suggested that human resources officials focus more on enhancing the source of internal control in employees through individual and group counseling in light of the current anxious conditions of society and the significance of this aspect of health.

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Conflict of interest

The authors declared no conflict of interest.

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Ethical considerations

in order to comply with research ethics, personal consent and willingness to participate in the research was taken into account and the questionnaires were answered anonymously and the subjects were assured that the data obtained from the research questionnaires are analyzed and

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used only to check the goals and hypotheses of the research.

Code of Ethics

This article is taken from the doctoral dissertation with thesis approval code 1135484004083068300 17162447137 by the first author, fatemeh zarei.

Authors' contributions

F. Z, A. T were involved in choosing the topic, designing the study, and defining the concepts. Literature review and background were done by all the authors, F. Z collected and analyzed data and wrote the draf, N. SH. All the authors discussed the results and participated in editing the final version of the article.

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