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Can the Fagerstrom Test for Nicotine Dependence be Used to Evaluate the Nicotine Dependence in Electronic Cigarette Users?

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Objectives:The most commonly used test to evaluate the dependence is the Fagerstrom Test for Nicotine Dependence (FTND). There is no study on whether the FTND is useful to assess the dependence in e-cigarette users. We aimed to evaluate the reliability and construct validity of the modified version of FTND (FTND-ecig) in e-cigarette users.

Methods: 289 cigarette and e-cigarette users were included in the study using the snowball method in 2018. Patients were grouped as: regular cigarette users, quitters, e-cigarette users and dual users(cigarette and e-cigarette). Cigarette word was replaced with an e-cigarette in FTND and used as FTND-ecig. 15 puff was accepted as one cigarette in e-cigarette users. Cronbach alpha values were presented for internal consistency, and exploratory factor analysis was performed to assess the construct validity of FTND-ecig.

Results: 258 (85.43%) were male and mean age was 34±11. 132 (45.67%) patients were regular smokers, 50 (17.30%) patients were e-cigarette users, and 107 (37.02%) patients were dual users. Cronbach alpha coefficient was 0.508 in smokers, 0.522 in e-cigarette users and 0.392 in dual users. There was no significant difference among groups ($p>0.05$). Kaiser-Meyer-Olkin(KMO) value was 0.624 ($p<0.001$), and the structure had two factors in smokers. First cigarette in morning smoking item was loaded in second factor (eigenvalue: 0.77), the others difficult to refrain in forbidden places, cigarette hate most to give up, how many cigarettes a day, in morning time cigarette smoking and smoking if ill (eigenvalues were over 0.50, respectively) were loaded on the first factor. KMO value was 0.595 ($p<0.001$), and the structure had three factors in e-smokers. How many puffs and morning e-cigarette use were loaded on second factor (eigenvalues: 0.80 and 0.80, respectively), e-cigarette hate most to give up was loaded on third factor (eigenvalues: 0.76), the others were loaded on first factor(eigenvalues: 0.74, 0.68, 0.81, respectively). KMO was 0.577 and structure had two factors in dual users. The first cigarette in the morning was loaded on the second factor (eigenvalue: 0.77), the others(eigenvalues were over 0.50) were loaded on the first factor.

Conclusion: This study is the first study to evaluate the reliability and construct validity of FTND-ecig in e-smokers. We have found that FTND-cig has similar internal consistency in smokers and e-cigarette users, but not in dual users. We have seen that the psychometric properties of FTND-ecig are quite different among smokers, e-smokers, and dual users. We need reliable and valid tools to evaluate the nicotine dependence in e-cigarette and dualusers.

Keywords: Dependence, e-cigarette, cigarette