The Young Adults' Cigarette Dependence (YACD) score: An improved tool for cigarette dependence assessment in university students

Pascale Salameh [a,*], Lamis Jomaa [b], Ghada Farhat [b], Hayat Zeghondi [c], Najwa Gerges [c], Carine Issa [c], Marie-Thérèse Sabbagh [b,c], Monique Chaaya [d], Bernadette Barbour [c], Mirna Waked [e], Joseph Salamé [f], Nina Saadallah-Zeidan [c], Isabelle Baldi [g] and The Lebanese National Conference for Health in Universities study group

[a] Lebanese University, Faculties of Pharmacy & of Public Health, Laboratory of Clinical and Epidemiological Research (LCER), Beirut, Lebanon
[b] Balamand University, Faculty of Health sciences, Beirut, Lebanon
[c] Lebanese University, Faculty of Public Health, Beirut, Lebanon
[d] American University of Beirut, Faculty of Health Sciences, Beirut, Lebanon
[e] Balamand University, Faculty of Medicine, Beirut, Lebanon
[f] Lebanese University, Faculty of Medicine, Beirut, Lebanon
[g] Bordeaux Segalen University, Institut de Santé Publique d'Epidémiologie et Développement (ISPED), Laboratoire Santé Travail Environnement (LSTE), Bordeaux, France

HIGHLIGHTS

► Cigarette smoking induces dependence in young smokers.
► We developed a scale for cigarette dependence in young adults (YACD).
► YACD covered dependence concept better than the FTND in Lebanese young adult smokers.

ARTICLE INFO

ABSTRACT

Background: Cigarette smoking induces dependence in young smokers.
Purpose: The primary objective of this work was to validate the use of the Fagerström Test for Nicotine Dependence (FTND) in young Lebanese university students, and to improve it eventually by adding new items covering DSM-IV and ICD-10 dependence components.
Methods: We used data from a cross-sectional study on university students. A standardized questionnaire was administered, with items related to cigarette dependence: the FTND and the new Young Adults' Cigarette Dependence (YACD) scale. For both tools, factor and reliability analyses were performed.
Results: Although the FTND test showed satisfactory psychometric properties, the YACD showed better construct validity and reliability, covered dependence concept better and discriminated better between those who wanted to stop smoking and those who did not.
Conclusions: FTND could be used in university students' population; however, the YACD scale could be more useful.

© 2013 Elsevier Ltd. All rights reserved.

1. Introduction

Tobacco consumption is one of the leading causes of morbidities and mortalities in the world. The total tobacco-attributable deaths are projected to rise to 8.3 million in 2030, at which point they will represent almost 10% of all deaths globally, mainly in developing countries (World Health Organization, 2008). Although adolescent smokers include few nicotine dependent individuals (Caldeira et al., 2012), this group of smokers is very likely to become nicotine dependent (Guo, McGee, Reeder, Gray, & 2010): in fact, some researchers showed that the most susceptible youths lose autonomy over tobacco within a day or 2 of first inhaling a cigarette (DiFranza et al., 2007). They also state that dependence can precede daily smoking and typically appears before consumption reaches 2 cigarettes per day (DiFranza et al., 2007). Furthermore, nicotine dependence was confirmed to appear at very low levels of daily smoking (Dierker et al., 2007).

Due to a combination of psychological, physiological and social variables, the problems related to tobacco consumption and nicotine dependence are extremely complex (Carmo & Pueyo, 2002). The dependence level, which may determine treatment modality, varies according to social level, cultural diversity, geographical region and

* Corresponding author at: Jdeidet El Meten, Chalet Suisse street, Azzam bldg, 5th floor, Beirut, Lebanon. Tel.: +961 3385542; fax: +961 1696600.
E-mail addresses: psalameh@ul.edu.lb, pascalesalameh1@hotmail.com (P. Salameh).

country borders (Becona & Vazquez, 1998; Fagerström et al., 1996). Nicotine, one of the basic components of tobacco, plays a major role in tobacco dependence that requires treatment both in biological and behavioral terms (Uysal et al., 2004). Some researchers draw a distinction between nicotine dependence and tobacco dependence (Zbikowski, Swan, & McClure, 2004), so that nicotine dependence is sometimes considered as one dimension of the more complex tobacco dependence (Hudmon et al., 2003).

The Fagerström Test for Nicotine Dependence (FTND), a revised version of the Fagerström Tolerance Questionnaire, is a screening tool for physiological nicotine dependence with acceptable psychometric properties (Haddock, Lando, Klesges, Talcott, & Renaud, 1999; Heatherton, Kozlowski, Frecker, & Fagerström, 1991); it is extensively used in various countries (de Meneses-Gaya, Waldo Zuardi, Regina Loureiro, & de Souza Crippa, 2009). FTND has however several limitations. First, the test fails to include important aspects of dependence, as defined in DSM-IV and ICD-10 (Etter, Duc, & Perneger, 1999; Moolchan et al., 2002). Several items of FTND are difficult to apply to moderate smokers, and its internal consistency is low (Etter et al., 1999; Heatherton et al., 1991). In a systematic review about psychometric properties of the FTND test, further validation studies were recommended before the extensive use of the FTND can be justified on the basis of its psychometric qualities (de Meneses-Gaya et al., 2009).

Although cigarette smoking is highly prevalent in Lebanon (World Health Organization, 2009), the FTND scale has never been validated in the Lebanese population, particularly among university students. The primary objective of this analysis was to validate the use of the FTND in the Lebanese university students' population, and to improve it eventually in order to better cover DSM-IV and ICD-10 dependence components, leading to a new scale: the Young Adults' Cigarette Dependence (YACD) scale.

2. Material and methods

2.1. Population and sampling

A cross-sectional study was carried out using a proportionate cluster sample of Lebanese students in the public and private universities. A list of universities in Lebanon, provided by the Center for Pedagogic Researches, was used to adjust the sample size (Center for Educational Research and Development, n.d.). A sample size of at least 3000 individuals was targeted to allow for adequate power for bivariate and multivariate analysis to be carried out.

Most universities' administrative offices in Lebanon that we approached did not allow drawing a random sample of their enrolled students to participate in the study: they did not provide us with the lists of students and permission was not granted to enter classrooms and search for students nominatively. Thus our research group had to work with a nonrandom sample of students outside their classes. Students were approached on campus during break times between courses by a field worker.

The latter explained the study objectives to the student; and after obtaining oral consent, the student was handed the anonymous and self-administered questionnaire. On average, the questionnaire was completed by participants within approximately 20 min. At the end of the process, the completed questionnaires were placed in closed boxes and sent for data entry. During the data collection process, the anonymity of the students was guaranteed. Out of 4900 distributed questionnaires, 3384 (69.1%) were returned to the field worker. Further methodological details are presented in more details elsewhere (Salameh et al., 2012).

Moreover, carbon monoxide measurement was performed on a subsample (n = 411) of the first study's population (n = 3384). The measurement was done using a CO-Tester-NG, F.I.M. Every participant from the subsample had to perform the measurement three times, and the highest result was recorded.

2.2. Questionnaire in samples 1 & 2

The questionnaire used in this study was composed of several parts, including the sociodemographic part, and a detailed smoking history, in addition to items of the FTND and other cigarette dependence questions.

For cigarette dependence evaluation, we used the FTND and the Fagerström Tolerance Questionnaire items (Fagerström & Schneider, 1989; Heatherton et al., 1991), and supplementary items that were deemed necessary to cover all aspects of dependence recommended as clinimetric tools such as DSM-IV and ICD-10 (Etter et al., 1999; Moolchan et al., 2002). Questions from the FTND and Fagerström Tolerance Questionnaire with dichotomous answers were transformed into Likert scale modes, to allow for better factor analysis. A total of twenty one Likert scale items were obtained (Table 1). The abovementioned twenty one items were included in the exploratory factor analysis that helped in reducing their number and generating the required scale.

2.3. Translation process

The original questionnaire was in English, however, it was administered to all participants in Arabic, the official and local language of the country. The translation process was as follows: first, two of the researchers, both bilingual, forward translated the questions into Arabic; instructions were given to them in the approach to translating, emphasizing conceptual rather than literal translations, as well as the need to use clear and culturally-acceptable terms and acceptable language for the general Lebanese audience, including young adults. Second, discrepancies were resolved by consensus between the first two researchers and two additional researchers: this panel thus included the original translators, experts in health, as well as experts with experience in instrument development and translation. Third, an independent translator with no knowledge of the questionnaire back translated the questions into English. Translation discrepancies were resolved by consensus between the researchers and the translator. Fourth, the questionnaire was pilot tested on 20 young individuals; all questions were deemed clear by these individuals, and no further changes were made to the initial questions.

2.4. Statistical analysis

Data entry was performed by independent lay persons that were unaware of the objectives of the study. Statistical analysis was performed using SPSS software, version 13.0. A p-value of 0.05 was considered significant. Cluster sampling effect was taken into account according to Rumeau–Roquette and collaborators (Rumeau-Rouquette, Breart, & Padieu, 1985). Data weighting was performed according to the Center for Educational Research and Development – Lebanese Ministry of Education (Center for Educational Research and Development, n.d.).

For the FTND test, an exploratory factor analysis was first performed with its items, after ensuring sample adequacy with the Kaiser–Meyer–Olkin (KMO) index, and Bartlett's Chi square test of sphericity. Factors were extracted using the principal component analysis. Items were retained if they loaded 0.3 or more on factors. Afterwards, reliability analysis was performed by Chronbach's alpha values for factors and the total scale. A similar methodology was applied for the new Young Adults' Cigarette Dependence scale (YACD) to evaluate the construct validity, where the whole twenty one items were entered in the exploratory factor analysis. After removing factors with low communality (<0.30) and low factor loading (<0.30), we continued with the construct validation. Since factors were found to be correlated, we chose to perform a promax rotation with Kaiser normalization. Similarly, reliability analysis was performed by Chronbach's alpha values for factors and the total scale.

In the majority of analyses, Spearman correlation coefficient was computed to correlate scales and subscales variables. Comparison of