National E-cigarette Survey (NECS) 2016 in Malaysia - method and population characteristics

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ABSTRACT

Introduction: E-cigarette and vape (ECV) use has become a worldwide phenomenon since 2010. This study aims to determine the prevalence of ever user, current user and factors associated with ECV use among Malaysian adults. This will provide evidence for policy makers to formulate appropriate measures towards regulation of ECV in Malaysia and can become a reference for other similar countries. **Method:** Complex sampling design was used to represent 19 million of Malaysian adult household. Samples were stratified by states and urbanity. Sampling units were districts, enumeration blocks and living quarters. All adults from the selected houses were invited to participate in this survey. Analysis was done using sampling weight and complex sampling analysis. **Results:** A total of 4,288 individual responded in this survey. Majority of the respondents were at 25-44 years of age group (44%), completed at least secondary level of education (69%), of Malay ethnicity (73%), Muslim (79%) and married (68%). Male and female were equally represented. Seventy two percent of the respondents were from the urban residential area (n=2,123). The prevalence of current ECV users was 3.2%, with an estimated number of 602,122 in the population. The prevalence was 3.3% and 2.9% in urban and rural respectively. ECV users were common among 18-24 years old, male and those with tertiary level education. **Discussion:** This study able to represent Malaysia and results can be used to guide healthcare managers to manage e-cigarette use in the country.

KEY WORDS:
Complex sampling, e-cigarette, population based

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Nicotine contents in e-cigarette liquids and aerosols

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ABSTRACT

The electronic cigarette (EC) is a device that imitates conventional cigarettes that vaporize a solution with or without nicotine. EC was used as an alternative to traditional cigarette, as a smoking cessation aid or to reduce cigarettes consumption. The aim of this study was to assess the nicotine levels in various EC liquid solutions and aerosols. A total of 75 different EC liquid solutions were obtained from shops in Klang Valley area which consisted of 35 nicotine-free solutions and 40 liquid solutions containing nicotine (3-12mg as labelled). 5uL of liquid solution was added with nicotine internal standard solution and diluted with methanol in a 2mL vial prior to analysis. Aerosols samples were obtained by pulling an air-tight syringe through XAD-4 sorbent tube connected to a vape device. The sorbent beads were later added with 1mL desorbing solution where both liquid and aerosol samples were analysed using gas chromatography mass spectrometry equipment. Nicotine contents ranged from 0.2mg to 17.0mg with an average of 7.0±5.0mg in 40 liquid samples containing nicotine. Only 6 out of 40 liquid samples have the same amount of nicotine as labelled; 20 liquid samples showed 17-96% higher nicotine and 14 liquid samples showed 17-83% lower nicotine content. Nicotine was detected in 5 out of 35 nicotine-free liquid samples ranged from 1mg to 5mg. Levels of nicotine in aerosol released from analysed liquid solutions (containing nicotine) varied from 0.04mg to 1.74mg with an average of 0.52±0.44mg. The percentage of nicotine released in the aerosol was between 0.4% and 16.0%. Presence of nicotine in the nicotine-free refill solutions and higher nicotine content may cause addiction and may not be effective for smoking cessation aid. Inconsistencies between labelled and true levels of nicotine indicate that information on the label may be misleading to users.