

## Increasing use of Electronic Cigarettes: An alarming trend

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An electronic cigarette (e-cigarette) or electronic nicotine delivery systems (ENDS) is a handheld electronic device that delivers nicotine via a vaporised liquid consisting of propylene glycol, glycerol and nicotine.<sup>1,2</sup> The popularity of e-cigarettes continues to rise worldwide with 6.7% of adults and 11.3% of high school students in the United States reporting current e-cigarette use.<sup>3,4</sup> In Pakistan, a study reported use of electronic cigarettes in 6.2% of medical students.<sup>5</sup> The notion of e-cigarettes being less harmful than conventional cigarettes has propelled their popularity.<sup>6</sup>

It is important to see the health effects of e-cigarette use through the lens of the intended purpose and duration of use: short term as a cessation aid for tobacco smoking, as a long-term alternative to tobacco smoking, or as a product that nonsmokers resort to considering it less harmful. The last cohort is the greatest cause of concern and efforts need to be made to cut down on the use of e-cigarettes due to their adverse effects.

Higher socio-economic status, smoking more cigarettes, and attempting to quit within the past one year have been found to correlate with e-cigarette use (vaping).<sup>7</sup> Whereas attempting to avoid the health related ramifications of tobacco smoke tends to be the most common reason for vaping, alongside trying to cut down or quit cigarette smoking, never smokers have also reported e-cigarette use.<sup>8</sup>

Studies have demonstrated the presence of deleterious substances in e-cigarette aerosols, including carcinogens, such as formaldehyde and acetaldehyde.<sup>2</sup> Use of liquids containing nicotine is much more prevalent than nicotine-free e-cigarette liquids. Hence, the use of e-cigarettes particularly by

those who do not use tobacco, promotes nicotine addiction.<sup>2</sup>

E-cigarette, or Vaping, Product Use–Associated Lung Injury (EVALI) is another major cause of concern. As of February 18, 2020, a total of 2,807 hospitalized EVALI cases or deaths have been reported to CDC in the US and sixty-eight deaths have been confirmed. Vitamin E acetate and tetrahydrocannabinol appear to be associated with the outbreak; however, no single causative agent has been identified.<sup>9</sup>

There is robust evidence to corroborate that in youth and young adults, e-cigarette use increases the risk of ever using combustible tobacco cigarettes.<sup>10</sup> Moreover, e-cigarette use has been reported to correlate with increased frequency and intensity of subsequent combustible tobacco cigarette smoking.<sup>10</sup> A recent meta-analysis also delineated that young adults who have used e-cigarettes are 3.6 times more likely to use cigarettes, compared to nonusers.<sup>11</sup> A study from Pakistan also showed a strong association of e-cigarette use with consumption of conventional cigarettes [OR: 10.6, 95% CI 3.6–30.8,  $p < 0.001$ ] and use of smokeless tobacco products [OR: 7.9, 95% CI 2.7–23.4,  $p < 0.001$ ].<sup>5</sup>

These studies are alarming because they show that e-cigarettes can addict a new generation to nicotine and tobacco. The United States Food and Drug Administration recently acknowledged adolescent e-cigarette use as an epidemic.<sup>10</sup> It is important to address this issue in Pakistan as well, where the popularity of e-cigarettes is increasing, particularly amongst young adults.

The sale and use of e-cigarettes should be prohibited in all cases where use of conventional cigarettes is

prohibited. E-cigarette marketing should be put under the same level of restrictions as conventional cigarettes and standards should be established for regulating product ingredients and functioning.<sup>12</sup>

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