

BACKGROUND & PURPOSE

Use of electronic nicotine delivery systems (ENDS), has become increasingly prevalent among young adults.

ENDS can be classified into two main types: 1) Disposable (e-cigarettes with nicotine cartridges); and 2) Refillable (requiring nicotine e-liquid which is stored in a small tank in the device).

Current measures assessing ENDS use mirror traditional measures assessing cigarette use. However, considering the two different types of ENDS products, these measures may not appropriately assess all ENDS use.

The purpose of this study was to determine if existing quantity and frequency measures appropriately capture END use among college students.

METHODS

Participants were 18 college-aged young adults, who were primarily white males who used refillable rather than disposable ENDS products in the past 30 days (see Table 1)

Participants finished a 175-item survey on marketing and alternative tobacco use, then completed a cognitive interview to assess comprehension of the survey questions. Interviews were conducted in three rounds, and items were revised after each round based on participant feedback and then further tested.

Table 1. Demographics of Participating ENDS Users (N=18)

	ENDS Ever User (n=7)	ENDS Current User (n=11)
Mean Age (sd)	21.1 (1.7)	22.6 (4.1)
Number of Males	3	8
Race/ Ethnicity		
White	4	7
Black	1	0
Asian	1	3
Hispanic/ Mexican	1	1
ENDS Device Used		
Disposable (e-cigarettes)	---	2
Refillable (Vape Pen)	---	8
Both	---	1

RESULTS

Participants readily recalled the following:

- Frequency of use (i.e. ever and past 30-day use) for both disposable and refillable ENDS
- Quantity (i.e. number of disposable e-cigarettes/ nicotine cartridges) consumed by disposable ENDS users
- Typical e-liquid nicotine concentration consumed by refillable ENDS users
- Table 2 lists the items that were retained in the survey following the cognitive interviews. These items changed slightly from round to round.

Current refillable ENDS users could not recall the following information regarding their amount of e-liquid consumed:

- Amount of e-liquid consumed daily
- Size of e-liquid supply bottle
- Number of bottles used in the past 30 days
- Size of their device's e-liquid storage tank
- Number of times they refilled their device's tank daily
- Table 3 lists the items that were subsequently removed from the final survey following the cognitive interviews.

Table 2. Final Items Retained in Survey

All ENDS products

During the past 30 days, have you used any ENDS product (i.e. an e-cigarette, vape pen, or e-hookah), even one or two puffs, as intended (i.e. with nicotine cartridges and/or e-liquid/e-juice)?

Disposable ENDS

During the past 30 days, have you used a disposable e-cigarette or an e-cigarette with a disposable nicotine cartridge? Neither requires the addition of e-liquid/e-juice.

During the past 30 days, how many disposable e-cigarettes or nicotine cartridges did you use?

Refillable ENDS

During the past 30 days, have you smoked a vape pen, personal vaporizer, or any other device as intended (i.e. with nicotine e-liquid/ e-juice)?

During the past 30 days, what was the typical concentration of nicotine in milligrams/milliliter (mg/ml) of the e-liquid/e-juice that you used?

Table 3. Items Removed from Survey

Refillable ENDS

On the days you used this device in the past month, approximately how many milliliters (ml) of e-liquid/e-juice did you consume on average in a given day? (≈ 20 drops = 1 ml)

What was the size bottle in milliliters (ml) from which you obtained your e-liquid/e-juice in the last month?

On the days that you used the product in the last month, how many bottles of e-liquid/e-juice did you usually use per day?

What size is the tank volume of your usual personal vape pen/ personal vaporizer?

During the past 30 days, how many times did you usually refill your tank of e-liquid/e-juice per day?



CONCLUSIONS

Items assessing frequency of use appear to appropriately capture both disposable and refillable ENDS use among college-aged users.

However, college-aged users of refillable ENDS have difficulty recalling quantity of use.

The need for additional research to develop valid and reliable items assessing refillable ENDS use is apparent, especially in light of the changing landscape (e.g. new high-end, customizable vaporizers) of use of products.