EXAMINATION OF THE IMPACT OF E-LIQUID NICOTINE STRENGTH ON PERCEIVED DEPENDENCE ON MYBLU ENDS

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disclosures

- LA Clinical Trials LLC and whatIF? Consulting Ltd design and conduct clinical and behavioural studies for manufacturers of tobacco/nicotine products and NRT

- Fontem US LLC sponsored the research studies described in this presentation

- Survey design and implementation was conducted independently of Fontem US LLC

- LA Clinical Trials LLC and whatIF? Consulting Ltd made the decision to submit the abstract/presentation

- Some additional data analyses were conducted by Imperial Brands PLC

introduction

- Proposed that ENDS with nicotine pharmacokinetic characteristics closer to smoking are likely more effective in helping adult smokers transition away from cigarette smoking

- However, greater nicotine delivery, which is often associated with higher concentrations of nicotine in ENDS liquids, proposed to lead to increased dependence

Applying the Population Health Standard to the Regulation of Electronic Nicotine Delivery Systems

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"Pod systems like JUUL and similar products deliver substantially higher levels of nicotine per puff compared to earlier ENDS products. The speed of delivery to the bloodstream and the relative physical tolerability of vaping compared to smoking may engender higher blood nicotine levels and greater symptoms of nicotine dependence."

AIMS

- *my*blu ENDS are available in the US in a range of nicotine strengths:

  - 0%, 1%, 1.2%, 2%, 2.4%, 2.5%, 3.6%, and 4%
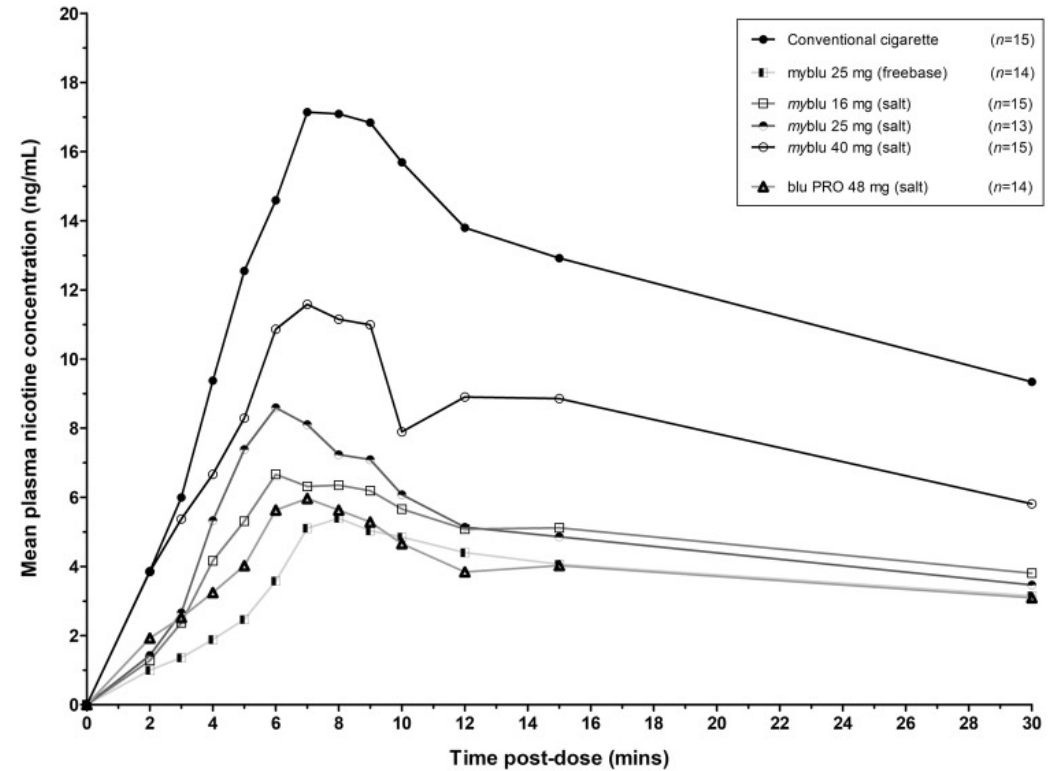
- Utilizing this nicotine strength range, assess whether higher nicotine content in e-liquids is associated with higher self-reported dependence among young adult and adult current users of myblu ENDS

METHODS

- Data analyzed from 3 waves of an online, cross-sectional survey assessing perceptions of the risks, addictiveness, and appeal of cigarettes and ENDS, including *my*blu

- Integrated into the survey were several measures of dependence:

  - PROMIS Short Form v1.0 Nicotine Dependence Item Banks for Daily and Non-daily Smokers

  - FTND question concerning time to daily first use of *my*blu ENDS

 - NYTS question concerning strong cravings in the past 30 days

RESULTS

Variable	Response	N (weighted %) Young Adults	N (weighted %) Adults
Age	N; mean (SEM)	553; 21.9 (0.07)	830; 39.3 (0.37)
Sex	Male	325 (64.5)	573 (66.0)
	Female	220 (34.0)	251 (33.1)
	Transgender	8 (1.5)	6 (0.9)
Region	Northeast	91 (19.5)	205 (24.5)
	South	242 (40.1)	298 (37.7)
	Midwest	120 (20.2)	137 (16.7)
	West	100 (20.1)	190 (21.0)
Hispanic, Latino/Latina, or Spanish origin?	Not of Hispanic, Latino/Latina, or Spanish origin	388 (70.6)	705 (83.2)
	Mexican, Mexican American, or Chicano	79 (13.9)	71 (9.5)
	Puerto Rican	40 (7.0)	19 (2.8)
	Cuban	12 (2.8)	12 (1.6)
	Multiple Hispanic Ethnicities	34 (5.8)	23 (2.9)
Race	White	329 (72.2)	680 (74.4)
	Black or African American	128 (15.8)	80 (16.7)
	American Indian or Alaska Native	10 (1.2)	13 (1.0)
	Asian	30 (5.2)	28 (5.6)
	Multiracial	56 (5.5)	29 (2.4)
Days *my*blu used in the past month	1 or 2 days	86 (16.0)	86 (10.6)
	3 to 5 days	152 (26.7)	188 (23.1)
	6 to 9 days	154 (28.1)	228 (31.2)
	10 to 19 days	109 (19.9)	195 (21.6)
	20 to 29 days	28 (5.1)	58 (6.1)
	All 30 days	24 (4.2)	75 (7.4)

RESULTS

|		All myblu users		Solus myblu users	
		Young adult N (weighted %)	**Adult** N (weighted %)	**Young adult** N (weighted %)	**Adult** *N (weighted %)*
Low nicotine concentration	0%	19 (4.8)	7 (1.5)	4 (3.5)	2 (2.0)
	1%	12 (2.1)	11 (1.6)	2 (1.0)	3 (2.9)
	1.2%	182 (33.4)	248 (30.3)	58 (34.9)	27 (27.7)
	Total	**213 (40.3)**	**266 (33.4)**	**64 (39.4)**	**32 (32.7)**
Medium nicotine concentration	2%	80 (13.3)	91 (13.2)	21 (13.0)	12 (12.5)
	2.4%	145 (25.3)	290 (31.0)	31 (22.7)	32 (34.8)
	2.5%	49 (8.6)	90 (10.6)	8 (4.9)	7 (6.4)
	Total	**274 (47.2)**	**471 (54.9)**	**60 (40.6)**	**51 (53.6)**
High nicotine concentration	3.6%	34 (6.8)	71 (8.8)	13 (9.0)	9 (10.6)
	4%	32 (5.7)	22 (2.9)	14 (11.0)	3 (3.1)
	Total	**66 (12.5)**	**93 (11.8)**	**27 (20.0)**	**12 (13.7)**

RESULTS
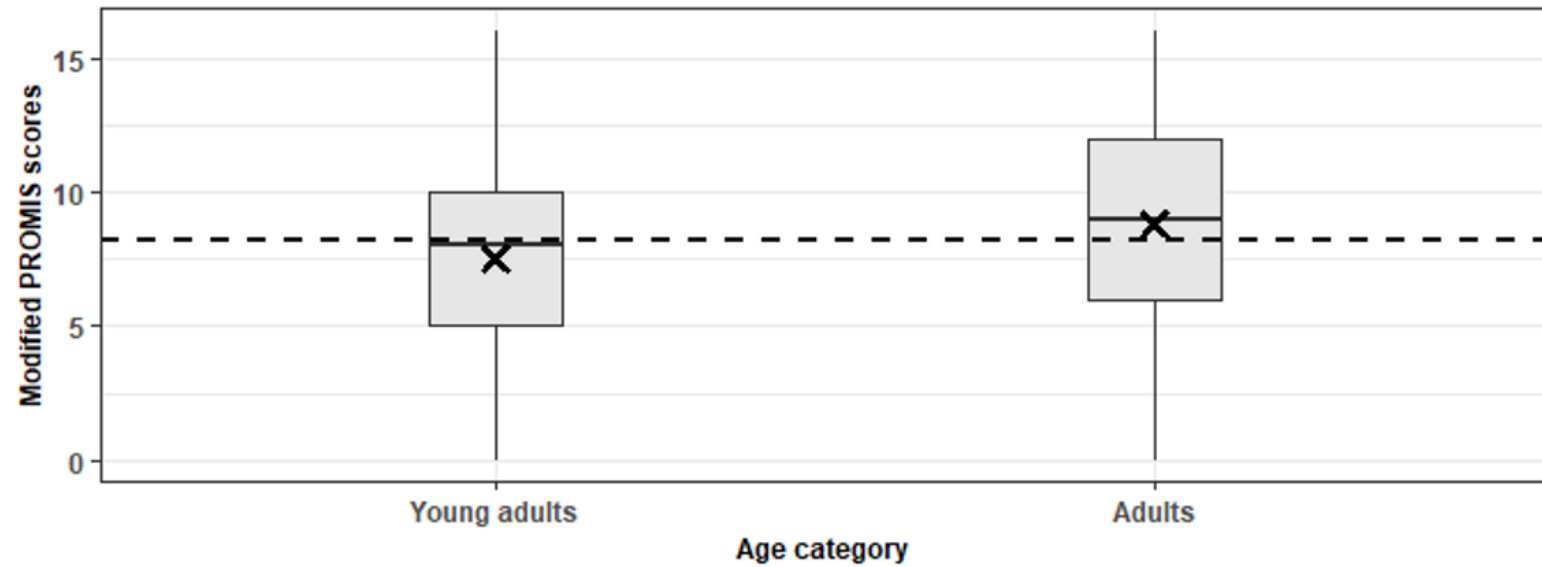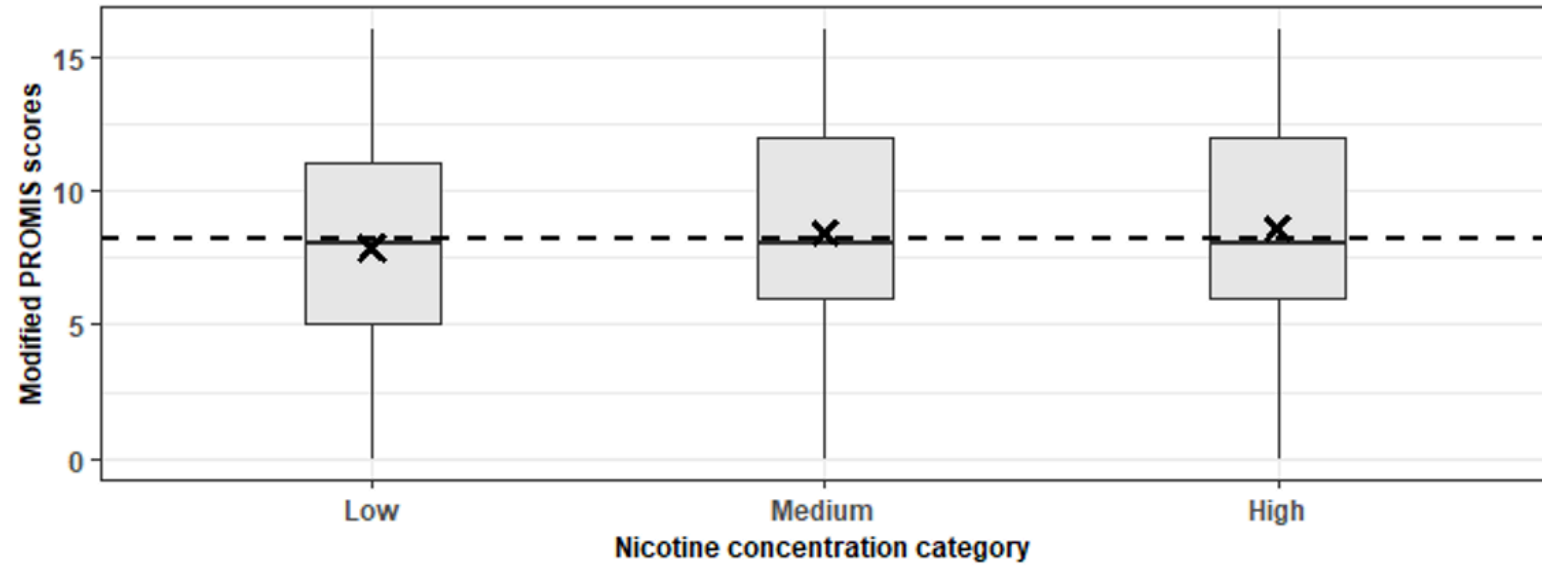
n = 553 young adults and 830 adults
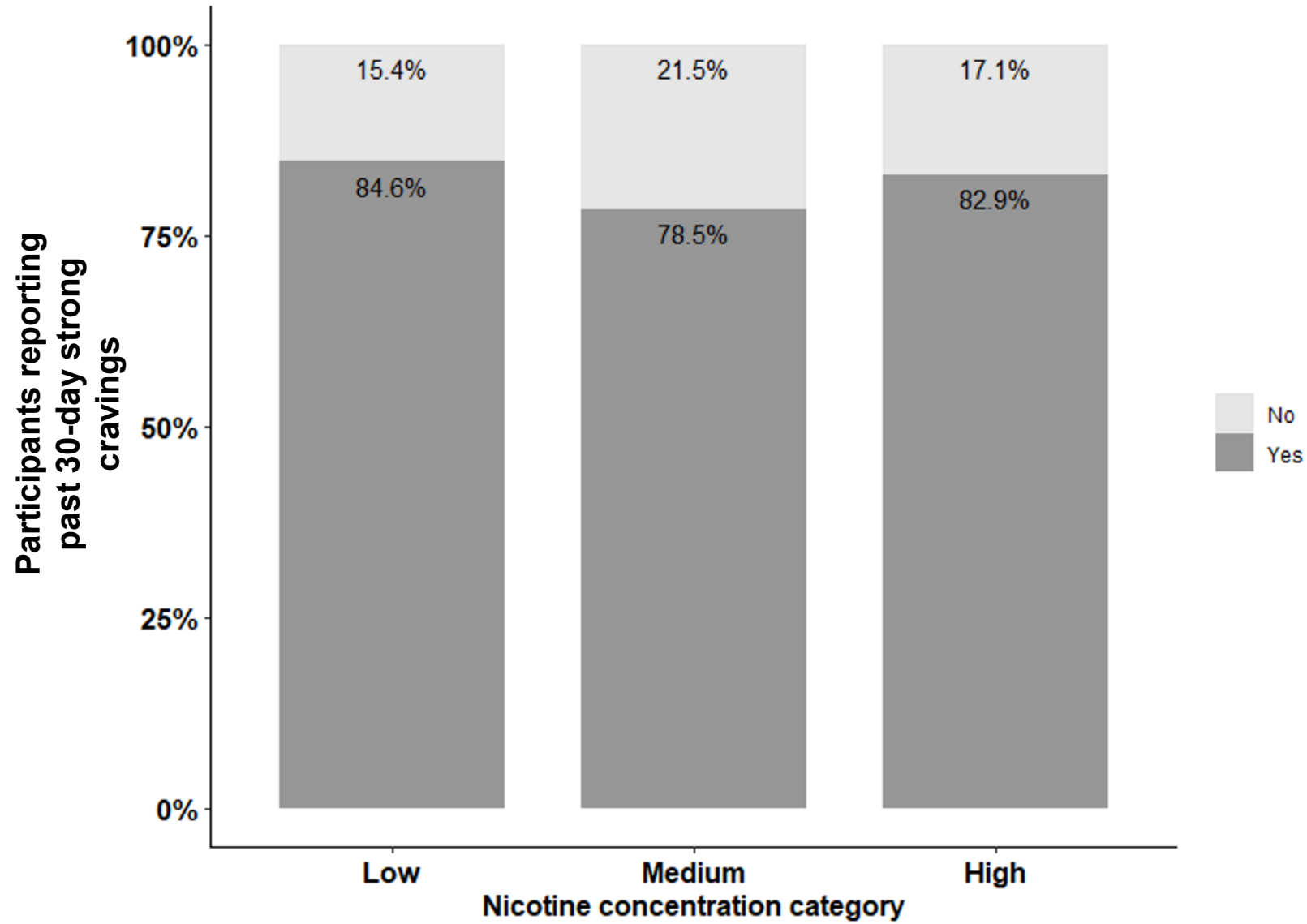
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n = 553 young adults and 830 adults
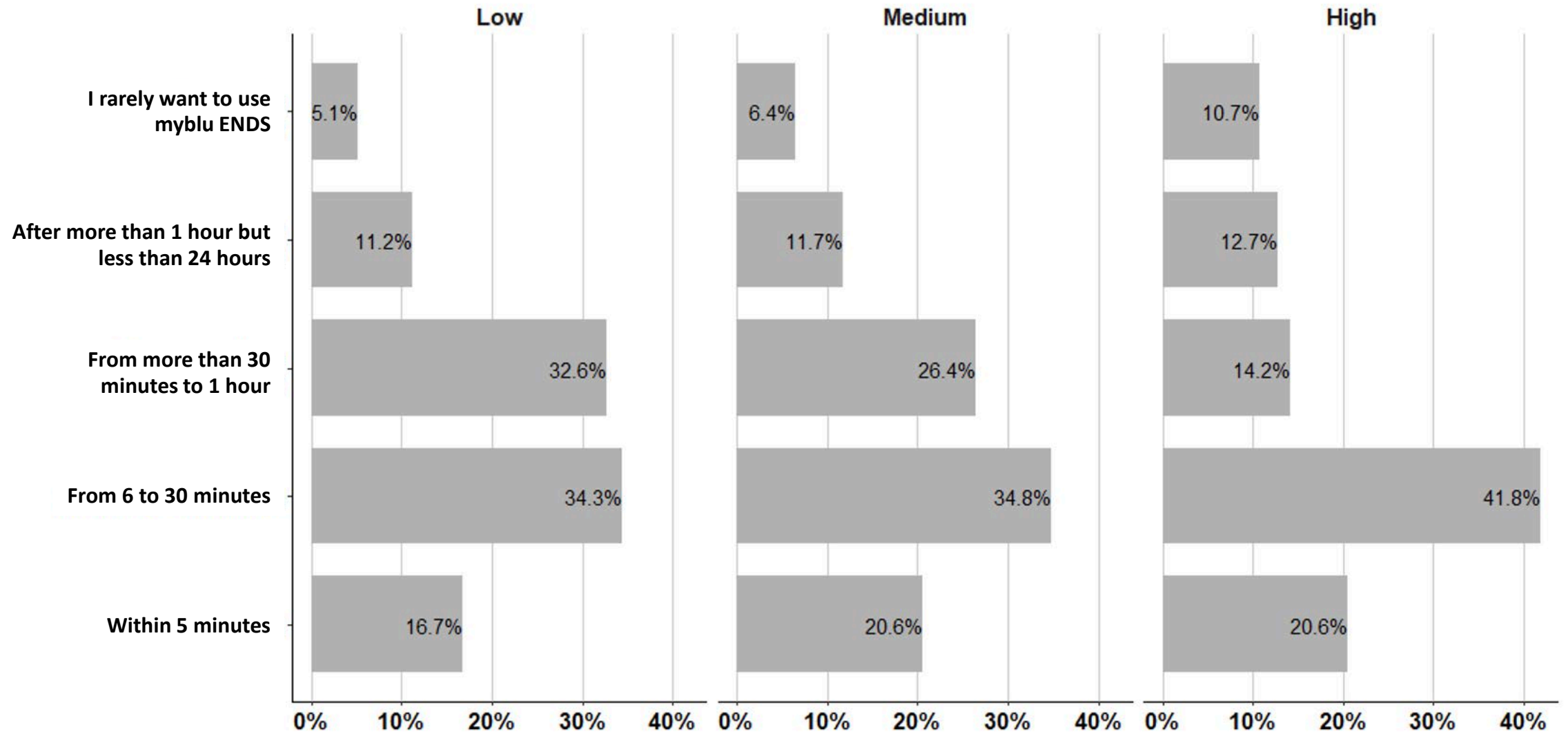
RESULTS

n = 553 young adults and 830 adults

RESULTS

- Global GLM revealed a statistically significant difference in PROMIS scores:
    - among the concentration groups (F = 4.07, p = 0.02)
    - between age groups (adults had higher total PROMIS scores; F = 20.01, $p < 0.001$)
- However, when performing multiple pairwise comparisons on nicotine concentration groups (low, medium, and high), all p values were > 0.05

- Contradictory results between the GLM and the multiple pairwise comparisons explained by a significant global effect ($p = 0.0172$) that became not significant when adjusting for multiple comparisons

RESULTS

- Craving scores among participants using low nicotine concentrations were not significantly different from those using a:

  - medium nicotine concentration (OR = 0.66, 95% CI [0.42, 0.103], p = 0.07)

  - high nicotine concentrations (OR = 0.95, 95% CI [0.49, 1.82], p = 0.98)

- Time to daily first use of *my*blu ENDS for participants using low nicotine concentrations was not significantly different from those using a:

  - medium nicotine concentration (OR = 0.89, 95% CI [0.70, 1.14], p = 0.35)

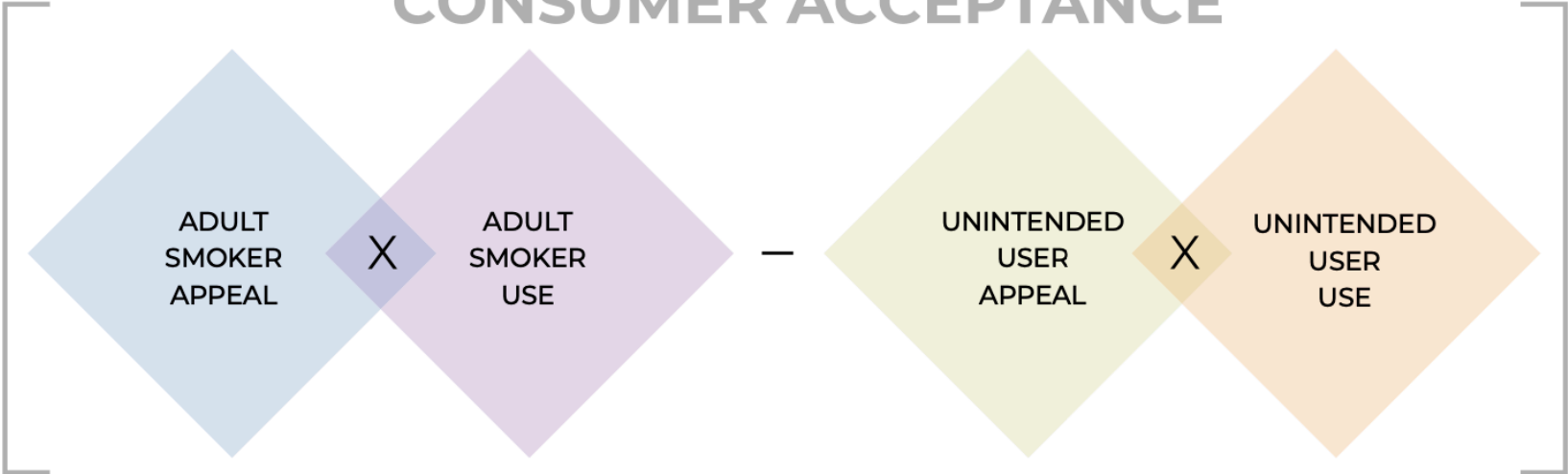 - high nicotine concentration (OR = 0.84, 95% CI [0.57, 1.25], p = 0.40)

CONCLUSIONS

- Self-reported dependence was broadly similar among current *my*blu ENDS users who use different nicotine concentration e-liquids

- Users of higher concentrations were no more dependent on *my*blu ENDS than users of lower nicotine concentrations

- Data also suggest that use of e-liquid salt formulations does not lead to higher dependence on myblu ENDS despite greater nicotine delivery compared with freebase formulations

CONCLUSIONS

POPULATION LEVEL TOBACCO HARM REDUCTION = HARM REDUCED NEXT GENERATION PRODUCT X [**CONSUMER ACCEPTANCE** ADULT SMOKER APPEAL X ADULT SMOKER USE − UNINTENDED USER APPEAL X UNINTENDED USER USE]

MAXIMISING ADULT SMOKER TRANSITIONING

MINIMISING UNINTENDED USE

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