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RESEARCH BRIEF

Parents' Awareness and Perceptions of JUUL and Other E-Cigarettes

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Introduction: The purpose of this study is to examine awareness, attitudes, and related knowledge of e-cigarettes, and JUUL specifically, among parents of middle and high school students.

Methods: Data were collected in October–November 2018 from a nationally representative sample of U.S. parents of middle and high school students aged 11–18 years (n=2,885) to examine e-cigarette and JUUL awareness, concern about e-cigarette use, and school communication regarding e-cigarettes. Weighted frequencies and percentages are reported; Rao–Scott chi-square tests examined differences by school level. Data were analyzed in 2019.

Results: Although most parents (96.2%) had seen or heard of e-cigarettes, only 55.9% had seen or heard of JUUL, and only 44.2% accurately identified an image of JUUL as a vaping device. Many parents reported concern about adolescent e-cigarette use (60.6%), but fewer reported concern about their own child's use (32.9%). Most parents (73.5%) reported receiving no communication from their child's school about e-cigarettes or JUUL.

Conclusions: There are notable gaps in parents' awareness of JUUL. School-to-parent communication efforts are necessary to build parents' knowledge of e-cigarettes like JUUL to prevent the growing youth uptake of these novel and addictive products.

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INTRODUCTION

From 2017 to 2018, past–30-day e-cigarette use increased by 48% among middle school (from 3.3% to 4.9%) and 78% among high school (from 11.7% to 20.8%) youth in the U.S.[1] This dramatic rise prompted the U.S. Surgeon General to declare youth e-cigarette use a national epidemic, identifying that most e-cigarettes contain nicotine, which is highly addictive and can harm adolescent brain development.[2,3]

The rapid rise of youth e-cigarette use is driven predominantly by the recent emergence of high nicotine, USB-shaped e-cigarettes, like JUUL.[1,4] By the end of 2018, JUUL's sales accounted for 75.8% of the U.S. e-cigarette market share,[4,5] and a significant number of knock-off devices also entered the marketplace.[6] A 2018 study found that youth aged 15–17 years were 16 times more likely to be past–30-day JUUL users than adults aged 25–34 years, and 25.3% of present users aged 15–17 years used JUUL 10 or more of the past 30 days, suggesting regular product use and high risk of nicotine dependence.[7]

Although youth may use JUUL for many reasons including flavor availability and social media promotion,[8,9] the discreet flash drive design may be appealing and allow use to go undetected by parents.[10] Parents play an important role in influencing and monitoring

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adolescent behavior, particularly tobacco use.[11–13] However, the extent to which parents are aware of emerging e-cigarettes, like JUUL, and harms associated with nicotine use is unknown. This study examined awareness, attitudes, and related knowledge of e-cigarettes, and JUUL specifically, among parents of middle and high school students.

METHODS

Data were collected in October–November 2018 from the Ipsos KnowledgePanel, an online, nationally representative, probability-based sample of English- and Spanish-speaking adults. The analytic sample included parents of middle (Grades 6–8) and high (Grades 9–12) school students aged 11–18 years (n=2,885). A rostering system randomly selected 1 child for participants with multiple children in middle or high school. Data were weighted to be nationally representative of parents of middle and high school students in the U.S. Data were analyzed in 2019. Research was approved by the Advarra IRB.

Awareness of JUUL was measured using 2 sequential items: (1) participants were shown a photo of JUUL and asked to identify the device and (2) next asked: *Have you seen or heard of a product called JUUL?* Participants were then asked if they had seen or heard of e-cigarettes. Any JUUL awareness was defined as correctly identifying the JUUL photo or having seen or heard of JUUL.[14] All participants were subsequently provided information about JUUL and e-cigarettes to complete the survey.

To assess JUUL nicotine knowledge and nicotine harm perceptions, participants were asked: *To the best of your knowledge, how often do JUUL e-cigarettes, as designed, contain nicotine?* They were also asked whether they agreed or disagreed with 2 statements: *Nicotine exposure from e-cigarettes (including JUUL) during adolescence can cause addiction* and . . . *can harm the developing brain.* Concern regarding e-cigarette (including JUUL) use was assessed for (1) adolescents generally and (2) each participant's own child. Priority to prevent use was assessed for each participant's own child only. School communication was measured by the question: *In the past 12 months, excluding any disciplinary actions, did your child's school do any of the following to involve or communicate with parents about e-cigarette use (including JUUL use) by students?* Table 1 presents measures and response options.

Weighted frequencies and percentages for study measures were calculated using SAS Enterprise Guide, version 9.1. Rao–Scott chi-square tests evaluated school level differences.

RESULTS

Overall, 62.0% of parents had a child in high school. Table 1 presents sample characteristics overall and by school level. Although almost all parents (96.2%) had seen or heard of e-cigarettes, 55.9% had seen or heard of JUUL, and 44.2% correctly identified the photo of JUUL as a vaping device or an e-cigarette. A higher proportion of high school (47.1%) versus middle school (39.4%) parents correctly identified the device (p=0.01). Similarly, a higher proportion of high school (60.3%) versus middle school (48.9%) parents had seen or heard of JUUL (p<0.001). Overall, 64.1% of parents reported any JUUL awareness, which was significantly higher among high school than middle school parents (68.8% vs 56.4%, respectively; p<0.001). Among parents with any JUUL awareness, 48.6% correctly reported that JUUL pods as designed always contain nicotine, whereas 22.4% were unsure.

Most parents agreed that nicotine exposure during adolescence causes addiction (91.8%) and harms the developing brain (87.6%). Though almost two thirds of parents were very concerned about adolescents using e-cigarettes and JUUL (60.6%), only one third (32.9%) were very concerned about their own child's use, and 40.0% were not at all concerned. Overall, most parents (78.0%) reported that it is a very/somewhat high priority to prevent their own child from using e-cigarettes and JUUL, with this proportion higher among middle school (81.3%) than high school parents (76.1%, p=0.02). Overall, 73.5% of parents reported receiving no communication from their child's school regarding e-cigarettes or JUUL.

DISCUSSION

This study identifies a concerning gap in JUUL awareness among parents, with less than half of middle and high school parents correctly identifying a photo of JUUL. Although a slightly higher proportion of parents had seen or heard of JUUL, the limited number accurately identifying the device reflects a need to increase parental awareness of the rapid uptake of JUUL and other USB-shaped e-cigarettes among young people.[1,3]

Although it is encouraging that most parents correctly identified that adolescent nicotine exposure causes addiction and harms the developing brain,[2] most who were aware of JUUL did not know or were unsure that JUUL pods always contain nicotine. Parents must be made aware that JUUL specifically poses a significant risk for adolescents owing to its high nicotine content.

Many parents rely on schools to educate them about emerging issues like e-cigarettes.[3,15] This study found, however, that most parents reported receiving no communication about e-cigarette or JUUL use from their child's school. Efforts to ensure effective school-to-parent communication must be developed free from industry influence and delivered through multiple channels with sufficient frequency.[16,17] Communication to parents should stress the increasing e-cigarette use prevalence and their expanding scope on the market.[1] Though most parents were concerned about adolescent e-cigarette use generally, only 2 in 5 were concerned about their own child's use. This is consistent with literature indicating parents underestimate their own adolescents' risk behaviors,[18] which can reduce likelihood of parental

Table 1. E-Cigarette or JUUL Awareness, Harm Perceptions, Concern About Use, and School Communication Among Parents of Adolescents

Characteristic	Total sample % (*n*)	Child school level		*p*-value
		Middle school % (*n*)	High school % (*n*)	
Total	100.0 (2,885)	38.0 (1,098)	62.0 (1,787)	
E-cigarette awareness				
Seen or heard of e-cigarettes				0.34
Yes	96.2 (2,779)	95.6 (1,049)	96.6 (1,730)	
No	3.8 (94)	4.4 (43)	3.4 (51)	
JUUL awareness				
JUUL device recognition[a]				**0.01**
Vaping device/e-cigarette	44.2 (1,249)	39.4 (405)	47.1 (844)	
USB drive	10.9 (336)	12.5 (151)	9.9 (185)	
Power bank	2.4 (74)	2.0 (26)	2.5 (48)	
Pencil lead	6.7 (197)	8.5 (84)	5.6 (113)	
Medical device	0.8 (26)	0.9 (11)	0.7 (15)	
Don't know	35.1 (984)	36.7 (415)	34.1 (569)	
Seen or heard of JUUL				**<0.001**
Yes	55.9 (1,626)	48.9 (550)	60.3 (1,076)	
No	44.1 (1,249)	51.1 (544)	39.7 (705)	
Any JUUL awareness[b]				**<0.001**
Yes	64.1 (1,852)	56.4 (628)	68.8 (1,224)	
No	35.9 (1,032)	43.6 (470)	31.2 (562)	
Contains nicotine[c]				0.41
Always	48.6 (868)	48.9 (289)	48.4 (579)	
Very often	19.4 (365)	16.4 (113)	20.9 (252)	
Sometimes	7.0 (127)	8.3 (44)	6.4 (83)	
Rarely	0.9 (18)	0.9 (9)	0.9 (9)	
Never	1.7 (26)	2.3 (11)	1.4 (15)	
Don't know	22.4 (439)	23.3 (156)	22.0 (283)	
Nicotine harm perceptions				
Causes addiction				0.19
Strongly agree/agree	91.8 (2,605)	92.4 (997)	91.4 (1,608)	
Neither agree/disagree	6.8 (201)	5.6 (68)	7.5 (133)	
Strongly disagree/disagree	1.4 (37)	1.9 (17)	1.1 (20)	
Harms the developing brain				0.17
Strongly agree/agree	87.6 (2,475)	88.1 (949)	87.3 (1,526)	
Neither agree/disagree	10.7 (325)	9.6 (112)	11.4 (213)	
Strongly disagree/disagree	1.6 (42)	2.3 (18)	1.2 (24)	
Concern about e-cigarette (including JUUL) use				
Concern about adolescent use				0.62
Very concerned	60.6 (1,708)	61.7 (652)	60.0 (1,056)	
Somewhat concerned	33.4 (990)	33.1 (374)	33.6 (616)	
Not at all concerned	6.0 (156)	5.3 (62)	6.4 (94)	
Concern about own child's use				0.77
Very concerned	32.9 (916)	31.9 (357)	33.5 (559)	
Somewhat concerned	27.2 (801)	28.0 (306)	26.6 (495)	
Not at all concerned	40.0 (1,124)	40.1 (421)	39.9 (703)	
Priority to prevent own child's use				**0.02**
Very high/somewhat high	78.0 (2,235)	81.3 (903)	76.1 (1,332)	
Medium	11.9 (346)	11.3 (110)	12.3 (236)	

(*continued on next page*)

Table 1. E-Cigarette or JUUL Awareness, Harm Perceptions, Concern About Use, and School Communication Among Parents of Adolescents (*continued*)

Characteristic	Total sample % (*n*)	Child school level		*p*-value
		Middle school % (*n*)	High school % (*n*)	
Very low/somewhat low	10.0 (274)	7.4 (76)	11.7 (198)	
School communication regarding e-cigarettes/JUUL[d]				0.05
No communication from school	73.5 (2,157)	76.3 (836)	71.8 (1,321)	
Any school communication	26.5 (728)	23.7 (262)	28.2 (466)	

Note: Boldface indicates statistical significance ($p<0.05$).
[a]"Candy" was also included as a response option for this question; however, it was not selected by anyone in the analytic sample.
[b]Any JUUL awareness refers to correctly identifying the JUUL device as a vaping device or e-cigarette or having seen or heard of JUUL.
[c]Analyzed only among those with any JUUL awareness (n=1,852).
[d]Any school communication regarding e-cigarettes or JUUL refers to identifying at least 1 of the following from a select all that apply list: (1) Held a Parent Teacher Association meeting or school town hall meeting with parents; (2) Sent a letter or e-mail home to parents; (3) Held one-on-one meetings with parents; (4) Phone call to parents; (5) Pre-recorded voice messages to parents; (6) Sent messages to parents via text messages or smartphone apps; (7) Other. Disciplinary action was not included in these response options, in an effort to characterize the extent to which parents received general and not individual student-level communication or information from schools about e-cigarette or JUUL use.

intervention. Interestingly, more middle school versus high school parents reported e-cigarette use prevention was a high priority. This is promising, given that prevention messages at critical time points in a child's development, such as middle school, can stem further escalation of e-cigarette use and reduce e-cigarette initiation.[19]

Limitations

This study only included parents and did not assess student e-cigarette use. This study also did not investigate whether knowledge and attitudes were independently associated with demographics and personal tobacco use. Future research could explore these relationships.

CONCLUSIONS

There is an urgent need to increase parents' awareness and knowledge of risks associated with adolescent e-cigarette use. Parents are an important sphere of influence over adolescent behavior; increasing parental awareness of e-cigarettes like JUUL will be critical to stemming the increasing rate of youth e-cigarette use.[11] If current trends continue, there may be a new generation addicted to nicotine, setting tobacco control efforts back several years.[20]

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