Review of: "E-cigarette school policy and staff training: Knowledge and school policy experiences with e-cigarette products among a national sample of US middle and high school staff"

Andrew Springer[1], Steve Kelder[1]

1 University of Texas Health Science Center at Houston

Potential competing interests: The author(s) declared that no potential competing interests exist.

Invited Commentary: "E-cigarette school policy and staff training: Knowledge and school policy experiences with e-cigarette products among a national sample of US middle and high school staff."

Andrew E. Springer[1,3], Steven H. Kelder[2,3]

[1]Department of Health Promotion and Behavioral Sciences, University of Texas Health Science Center at Houston (UTHealth) School of Public Health-Austin, Austin, Texas

[2]Department of Epidemiology, Human Genetics & Environmental Sciences, UTHealth School of Public Health, Austin, Texas

[3]Dell Center for Healthy Living, UTHealth School of Public Health-Austin, Austin, Texas

Commentary

Schools are an important context for shaping adolescent health and health behaviors [1,2], with evidence that schools can influence adolescent health risk behaviors that include youth tobacco use [2-10]. In addition to representing a key *setting* for the delivery of health education programming- with evidence of the effectiveness of school-based health programs rooted in adolescent social competence in preventing tobacco product-related use among young people [11-14], schools as a *community of shared interest* also represent an important *target of change*, *agent*, and *resource* that can be further harnessed and activated for the prevention of youth tobacco product use, following the Typology of Community-Based Interventions *(community as setting, target of change, agent, and resource)*[15, 16].

With regard to schools as a *target of change*, a growing body of research suggests that the school a student attends may influence their tobacco-related behavior. In cross-sectional research our team conducted with Texas middle school students, for example, we initially found higher susceptibility to e-cigarette use for Hispanic students compared to white students, yet when the school socioeconomic context was taken into consideration, white students tended to have the same levels of susceptibility as Hispanic students when attending the same-SES schools [9]. These findings suggest an important role of the school social context in shaping e-cigarette use beyond a student's ethnicity. An analysis of nationally representative data from the U.S. provides further support for the role of the school context in shaping e-cigarette behaviors by documenting that attending middle and high schools where vaping is more common results in increased student-level odds of using e-cigarettes [10]. These studies add to a growing body of research on school context and

adolescent cigarette [2-6] and e-cigarette use [7, 8], and underscore the importance of schools as a *target of change* for shaping social norms to prevent tobacco and e-cigarette use that can complement classroom-based health education approaches.

In their recent paper entitled **"E-cigarette school policy and staff training: Knowledge and school policy experiences with e-cigarette products among a national sample of US middle and high school staff"**, Patel and colleagues [17] examine "…the potential impacts of school e-cigarette policies, policy training, and e-cigarette perceptions on school personnel e-cigarette knowledge, perceived implementation of the policy (i.e., whether they perceived students are caught using e-cigarettes), and prevention-based communication with students about e-cigarette avoidance." Their study provides several important contributions to the literature, beginning with a shift from a traditional focus on interventions aimed directly at educating young people about e-cigarettes, to one that embraces an ecological perspective by directly targeting the school policy and social environments that surround young people for the prevention of e-cigarette use. This focus expands our conceptualization of schools as a *setting* for delivering health promotion interventions, to one in which the school environment becomes a *target for change* (policy) and an *agent of change* (staff) for preventing adolescent e-cigarette use.

In this study of 1,525 U.S. middle and high school teachers and administrators, Patel et al. [17] found that respondents who reported e-cigarette policies had higher odds of recognizing e-cigarettes (e.g., recognizing what a JUUL is), communicating with students about e-cigarette avoidance, and reporting students had been caught using e-cigarettes at school. Of note, respondents who had been trained on the policy reported higher JUUL photo recognition, as well as higher odds of e-cigarette intervention actions with students. These findings build from and provide support for a *social ecological theoretical perspective* [18-20] as relates to harnessing the organizational (school e-cigarette policies) and interpersonal ecological levels (teacher influence on e-cigarette use) of influence for health promotion. Their findings also support the concept of *interactions of influence,* a key concept of social ecological models [20], by documenting that respondents who reported their school had an e-cigarette policy (policy environment) and had received training in the policy (social/organizational environment) engaged in increased e-cigarette intervention such as communicating with students about e-cigarette avoidance. Patel et al [17] also present initial evidence for a policy approach for fostering teacher social support for e-cigarette prevention, with relevance to social support theoretical constructs of emotional and informational social support [21], as e-cigarette policies were associated with increased staff communication with students about e-cigarette avoidance. Findings from Patel et al [17] provide important foundation for how health promotion practitioners can expand intervention approaches beyond classroom-based health education curriculum via the activation of the policy and social environments of a given school for e-cigarette prevention.

In addition to providing further evidence for the importance of e-cigarette prevention policy in relation to school staff intervention in e-cigarette use, the Patel et al. [17] study provides further documentation of the gaps in e-cigarette knowledge of school staff. With less than half of their national sample of U.S. teachers and administrators (47.5%) being able to identify an image of a JUUL, Patel et al.'s [17] findings underscore a pressing need for enhancing e-cigarette-related knowledge among these primary socialization groups of young people. Importantly, respondents who reported their schools had e-cigarette policies and who had been trained in the policy were more likely to be able to recognize a JUUL [17], which provides further foundation for these actionable strategies for health promotion practitioners to enhance

the adolescent eco-system of supports for e-cigarette prevention.

In exploring future research and practice directions, we offer additional commentary to the rich discussion by Patel et al. [17]. While the authors recognize important limitations of their study, including the lack of a nationally representative sample as well as the lack of student-level data, a key limitation not noted was the use of a cross-sectional study design *(Note: we infer that a cross-sectional study design was used; the design was not explicitly stated in the article)*. The lack of temporality between exposure and outcomes (i.e., the lack of assessing knowledge and practices prior to and post policy implementation) limits our ability to conclude that the implementation of school e-cigarette policies results in greater staff awareness of JUUL and student intervention (i.e., communicating with students about e-cigarettes and reporting that students had been caught using e-cigarettes at school). Other plausible explanations may be that schools with increased use of e-cigarettes by students (and thus, observing students being caught using e-cigarettes) may result in greater demand and implementation of e-cigarette policies, or that teachers who report communicating with students about e-cigarettes are just more aware of e-cigarette policies at their school or have better recall about the trainings they may have received for e-cigarette prevention. This study limitation underscores the need for future longitudinal and experimental research to better understand how e-cigarette policies and trainings may impact school staff knowledge and e-cigarette prevention practices.

On this related note, we appreciate and agree with the insightful future directions cited by the authors as relate to the need for research on how school e-cigarette policy components, policy training components, and school personnel intervention impact students' e-cigarette use. We add to these future research needs by also underscoring the importance of understanding: a.) how different types of e-cigarette policies may impact student e-cigarette use; b.) what type of staff training may be most conducive to student e-cigarette prevention; and c.) how school staff engage with students to communicate about e-cigarette avoidance.

Understanding the impact of different types of e-cigarette policies on student e-cigarette use is key given the potential to 'do harm', as Patel et al [17] insightfully cite in their discussion. Adding to the discussion by Patel et al [17] on the adverse effects of punitive policies such as suspension and expulsion on student disengagement and increased tobacco use [2, 22, 23], schools with supportive versus punitive practices may provide additional benefits for both a positive school social climate and healthy adolescent development. Supportive practices such as counseling; referral services for issues such as substance use; helping students with social, emotional and behavioral problems; and other restorative justice practices such as community-building circles to establish trust and collective bonds have been associated with greater adolescent sense of belonging and school connectedness [24, 25], defined broadly as having caring and supportive relationships in school [26]. While further research is needed on the role of school connectedness for the prevention of e-cigarette use given limited and mixed findings [27-31], school connectedness has been cited to be among the factors most consistently associated with reduced risk of smoking according to the U.S. Surgeon General's Report [11]. Schools that support punitive policies for e-cigarettes, such as legislation in Texas (where the authors are based) that makes vaping THC oil a felony [32, 33], may decrease school connectedness while increasing adverse legal and social consequences for young people. Strategies such as the American Lung Association's INDEPTH initiative (Intervention for Nicotine Dependence: Education, Prevention, Tobacco and Health) are an example of an alternative approach to school suspension or citation that aims to provide direct support for students by teaching them

about nicotine dependence, establishing healthy alternatives, and tobacco cessation [34]. Approaches such as INDEPTH can further support schools not only as *agents of change*, but as a *resource* for supporting adolescent health behavior change. As such, we underscore Patel et al's [17] recommendation for future research not just on the existence of school e-cigarette policies, but on the type of policy and its potential for positive or negative impact on student e-cigarette use and healthy adolescent development.

In support of Patel et al's [17] recommendations, we also need to better understand the roles of e-cigarette policies and school staff trainings in preventing adolescent e-cigarette use and in supporting cessation among adolescents who are currently vaping. In addition to exploring the impact of e-cigarette policies on e-cigarette prevention, we also make a call for research that helps us understand the relative importance of school e-cigarette policies versus school trainings on e-cigarette policies versus other types of e-cigarette prevention trainings for staff. Thus, should health promotion practitioners focus their time on getting e-cigarette policies enacted, on training teachers in those policies, or on other types of school staff e-cigarette prevention trainings- such as those that teach school staff how to provide positive social support for adolescent e-cigarette prevention? Understanding the independent contributions of these e-cigarette prevention strategies as well as their combined effects hold promise to grow our collective toolbox of prevention strategies.

Lastly, and related to the above point, we make a call to action for further research on the best way school staff can provide communication, and more broadly, social support for e-cigarette prevention. As guided by social support theory [21], social support includes not only informational support (e.g., communicating to students about e-cigarette avoidance), but also positive encouragement and emotional support, instrumental support- such as referrals to cessation support or to other 'prosocial activities' and 'prosocial others', and modeling support- which may include teachers' own testimonials about abstaining from e-cigarettes or struggles with tobacco addiction.

In conclusion, findings from Patel et al. [17] provide important evidence on the association of e-cigarette policies and training with increased e-cigarette knowledge and intervention among U.S. middle and high school teachers and administrators. Notably, their research provides needed foundation for expanding e-cigarette prevention efforts from a focus on school as a *setting* for intervention delivery via classroom-based educational strategies, to a focus on school context as a *target of change* and *agent for change* via school policy and school staff's role in supporting e-cigarette prevention and cessation among students. We look forward to continuing to co-learn with tobacco researchers and health promotion practitioners as well as school leaders, students, and parents, about ways to harness and activate the school context for adolescent e-cigarette prevention.

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