Addictive Behaviors 76 (2018) 376–381

Contents lists available at ScienceDirect

Addictive Behaviors

journal homepage: www.elsevier.com/locate/addictbeh

Commentary

Young or adult users of multiple tobacco/nicotine products urgently need to be informed of meaningful differences in product risks

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ARTICLE INFO

Article history:
Received 13 January 2017
Accepted 23 January 2017
Available online 25 January 2017

ABSTRACT

Previously, it has been argued that health information efforts need to inform the public about meaningful differential risks from tobacco/nicotine products. The fact of multiple product use by the same individual further supports this need. When the majority of youth, for example, who use smokeless tobacco are also current tobacco smokers, it makes little sense to mount a smokeless prevention campaign that fails to include clear messages about the much greater risks from smoking. In April 2016, The Food & Drug Administration (FDA) announced a $36 million campaign for youth that "smokeless doesn't mean harmless." Research shows the public (a) already knows that smokeless tobacco is not harmless, but are (b) also largely unaware that cigarettes are much more harmful than smokeless. Though not harmless, smokeless tobacco has been estimated to be over 90% less harmful than cigarettes. 'Gateway' fears are made moot by current use of multiple tobacco/nicotine products. When multi-tobacco product use is commonplace among users, usable information on significant differences in risk is crucial for both adult and younger users. The FDA and like campaigns and health information websites should follow established ethical principles and accepted communication methods to inform the public of less-harmful tobacco/nicotine products as well as the greater harms of smoking, in keeping with the Surgeon-General's advice that reductions in smoking in particular will bring about the greatest public health advances.

1. Considering youth who are already smoking and using other tobacco/nicotine products

Much of the public education effort on the use of tobacco/nicotine products is directed at preventing never users of any tobacco/nicotine products from becoming ever users of any tobacco/nicotine product (National Center for Chronic Disease Prevention and Health Promotion, 2014). The fear of the 'gateway' effect is fueled both by the desire to prevent any tobacco/nicotine use as well as the desire to prevent subsequent cigarette smoking. As laudatory as these efforts are, they neglect the impact on adult consumers as well as the predicament experienced by many high-risk youth who have already crossed through (thus rendering moot) any arguable 'gateway' because they are already current users of tobacco cigarettes as well as a range of other tobacco/nicotine products. These consumers and potential consumers have a fundamental right (based on the principles of autonomy, health communication, and health literacy) to be well aware of the dramatic differential harms from the various products they are already or might consider using (Kozlowski & Sweanor, 2016).

This 'debate' argues that we need to recognize the critical issue of multiple tobacco/nicotine product use for high-risk youth as well as tens of millions of American adults, and to be educating these consumers, whether youth or adults, about major differential harms from different products they are already using. For those who might oppose informing everyone of the major differential harms of tobacco/nicotine products, they should recognize the even more persuasive arguments for providing such information to the many (young or old) that are already using multiple tobacco/nicotine products. Even if ethically defensible (which we do not believe to be the case) it should also be appreciated that there would be no practical way to limit the availability of accurate health information so that it would only reach adults or only high-risk youth. These issues will be discussed herein.

Our examples focus on smokeless tobacco (ST) and cigarette use because (1) the differential harms are very well-established and very large (discussed below), (2) the level of dual use is high for youth (e.g., 60% of high school males who used ST in the past 30 days also smoked (Tomar, Alpert, & Connolly, 2010)), and (3) the U.S. Food and Drug Administration (FDA) has recently announced a $36 million youth-targeted

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http://dx.doi.org/10.1016/j.addbeh.2017.01.026

campaign on the harms from ST (U.S. National Library of Medicine, 2016) that fails to directly warn about the much greater harms from smoked tobacco (predominantly cigarettes). Although the FDA is framed as a 'prevention' campaign, surely such a campaign would hope to prevent the development of regular daily use of ST by those who have only experimented with use.

2. Preventing youth use of tobacco/nicotine

Protecting children has long had a special place in the rhetoric and practice of tobacco/nicotine policy. For a young person, before the age of majority, to become addicted to a tobacco/nicotine product is an event that everyone can agree is more troubling than for an adult for whom one can generally assume much greater responsibility for ill-advised actions. While there has been an understandable 'zero-tolerance' for youth using tobacco/nicotine, it is clear that youth has been and will likely continue to be the period in which the large majority of users start (National Center for Chronic Disease Prevention and Health Promotion, 2014). 'Zero-tolerance' for use by youth should be sought, but there is an abiding reality that nicotine-use prevention efforts are imperfectly effective, just as abstinence campaigns are for other risky substance-use behaviors engaged in by youth (Johnston, O'Malley, Schulenberg & Miech, 2014). Prevention efforts can help keep product usage by youth to lower levels, but they have never completely prevented experimentation or regular use. The young person who is already using some tobacco products should be recognized as being at especially high risk of using other tobacco/nicotine products and developing more frequent use patterns.

3. Use of both smokeless *and* smoke is very common among young smokeless users

In 2012, *more* youth (aged 12–17) both smoked (any smoked product) and used smokeless (57%) than used smokeless only (43%) (Table 13.14) (National Center for Chronic Disease Prevention and Health Promotion, 2014). In 2014, 44% of 12th grade males who used smokeless also smoked cigarettes (Johnston, Miech, O'Malley, Bachman & Schulenberg, 2014). A targeted anti-ST campaign should make use of this important opportunity for educating such dual/multi tobacco product users about comparative risk information of direct relevance to them. Looking at the transition patterns for ST and smoking across a few studies in adolescents and adults, it was clear that dual use at time 1 was linked to significant percentages of continued use 4 years later: for adult males, 44.3% were dual users, 27% were exclusive smokers, 17.4% were exclusive ST users; for adolescents, 20.4% were dual users, 31.3% were exclusive smokers, 34.2% were exclusive ST users (Tam, Day, Rostron, & Apelberg, 2015). These patterns argue for educating these consumers about major differential product risks.

The special problem of multiple product use has been acknowledged by FDA and National Cancer Institute researchers (Kaufman, Land, Parascandola, Augustson, & Backinger, 2015): "Findings suggest that adolescents who use multiple tobacco products are likely to continue such use as they move into young adulthood. When addressing tobacco use among adolescents and young adults, multiple forms of tobacco use should be considered." (p.251). Others have encouraged based on their research that "Public health interventions and communication campaign messages focused on tobacco prevention and control may be useful in decreasing concurrent tobacco product use, especially if they target beliefs and/or poly-tobacco use of products as opposed to single tobacco product use only" (Kowitt et al., 2015).

4. Alleged causal 'gateways' are limited issues to begin with, but become largely irrelevant for those who already use multiple products

Although concerns about causal drug gateways have considerable political power and rhetorical force (Bell & Keane, 2014), their scientific substance is very limited (Degenhardt et al., 2010; Kleinig, 2015; Kozlowski, 2015b; Kozlowski & Abrams, 2016; Rodu & Cole, 2010; Vanyukov et al., 2012). Longitudinal observational studies cannot establish that (a) prior use of product A *causes* the use of product B (Phillips, 2015) and (b) that other associated influences on product use (e.g., characteristics of the individual user, risk-taking or use of still other drug products) have not been responsible or strong contributors to movement to other products (Vanyukov & Ridenour, 2012). In the case of snus (Swedish ST) use in Scandinavia, concern for a causal gateway to cigarettes has not been supported by the research ((Lund & Lund, 2014; Scientific Committee on Emerging and Newly Identified Health Risks, 2008).

Causal gateway concerns should be moderated by the actual likelihood of progression from the lower-risk product to the higher risk, which in turn can be shaped by marketing effects and public policy (Kozlowski, 2007; Kozlowski, 2015a). If a minority of initial users of the lower-risk product move on to regular use of the more dangerous product, this is not an indication of a gateway that will be important for population health unless it results in a greater overall number of smokers (Kozlowski & Abrams, 2016; Levy et al., 2017). Also, if a majority of users of the less-harmful product do not move on to regular use of the more dangerous product, then this would be consistent with some users possibly being prevented from using the more dangerous product because of the use of the less-harmful product.

But the gateway issue is moot for the many young ST users who are already smoking. Once the individual already smokes and uses smokeless or other tobacco/nicotine products, to worry about gateways is like worrying about shutting the barn door after the horse has escaped. The priority for this group of multiple-tobacco/nicotine product users should be to try to reduce risks as much as possible, *if cessation of all tobacco/nicotine products cannot be achieved.*

Concerns about possible net negative effects of population health of lower-risk products have been a fundamental issue (Kozlowski, Strasser, Giovino, Erickson, & Terza, 2001; Stratton, 2001). This issue has been discussed in detail (Kozlowski & Sweanor, 2016) and suppression of accurate health information should not be justified by 'concerns,' but rather would need actual, persuasive evidence of net ill-effects—which is non-existent (Kozlowski & Sweanor, 2016).

But what about adverse effects on brain development? The weakness of gateway arguments and evidence has contributed to the focus on another concern about the effects of nicotine on the developing brain (Kozlowski & Abrams, 2016). For example, Chris Hansen, President of the American Cancer Society Action Network said: "There is no reason for a teen to use any tobacco product. Nicotine exposure at a young age can cause lasting harm to brain development, and the addiction to nicotine often lasts for life." (American Cancer Society Action Network, 2015). This over-arching goal of protecting youth from these products should be tempered by recognition that once tobacco use has started, no matter the age of the user, harm reduction and so-called tertiary prevention are important.

5. But aren't kids, even adolescents, special cases?

While there are concerns about the ability of adolescents to assess and act upon risk information and adults may be somewhat better at it, adolescents are often judged to have the capacity to give informed consent on important matters and do respond to well-presented risk information in a way that is similar to adults (Millstein & Halpern-Felsher, 2002; Reyna & Farley, 2006; Rivers, Reyna, & Mills, 2008; Scott & Wollard, 2013; Steinberg, 2008; Steinberg & Cauffman, 1996). One expert concluded: "In sum, adolescents' greater involvement than adults in risk-taking does not stem from ignorance, irrationality, delusions of invulnerability, or faulty calculations" (Steinberg, 2008). Close analysis of the ability of adolescence and adults to perceive and assess risks shows more similarity than differences (Beyth-Marom, Austin, Fischhoff, Palmgren, & Jacobs-Quadrel, 1993). Tobacco control might