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Editorial: 2nd Special Issue on behavior change, health, and health disparities

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Abstract

This Special Issue of *Preventive Medicine (PM)* is the 2nd that we have organized on behavior change, health, and health disparities. This is a topic of fundamental importance to improving population health in the U.S. and other industrialized countries that are trying to more effectively manage chronic health conditions. There is broad scientific consensus that personal behavior patterns such as cigarette smoking, other substance abuse, and physical inactivity/obesity are among the most important modifiable causes of chronic disease and its adverse impacts on population health. As such behavior change needs to be a key component of improving population health. There is also broad agreement that while these problems extend across socioeconomic strata, they are overrepresented among more economically disadvantaged populations and contribute directly to the growing problem of health disparities. Hence, behavior change represents an essential step in curtailing that unsettling problem as well. In this 2nd Special Issue, we devote considerable space to the current U.S. prescription opioid addiction epidemic, a crisis that was not addressed in the prior Special Issue. We also continue to devote attention to the two largest contributors to preventable disease and premature death, cigarette smoking and physical inactivity/obesity as well as risks of co-occurrence of these unhealthy behavior patterns. Across each of these topics we included contributions from highly accomplished policymakers and scientists to acquaint readers with recent accomplishments as well as remaining knowledge gaps and challenges to effectively managing these important chronic health problems.

Keywords

Behavior change; Chronic health conditions; Cigarette smoking; Tobacco use; Health disparities; Obesity; Prescription opioid abuse; Lifestyle; Behavioral economics

Introduction

This Special Issue of *Preventive Medicine (PM)* is the 2nd in a series that focuses on behavior change, health, and health disparities. The first Special Issue appeared in

In memory of Drs. Drina Vurbic and Olaya García-Rodríguez, outstanding scholars and contributors to this volume, who passed away prior to its completion and much too soon.

Competing interests

The author has no conflicts of interest to report.

November 2014 (<http://www.sciencedirect.com/science/journal/00917435/68/supp/C>). Each of the contributors to these Special Issues is an accomplished contributor to the general topic area of behavior and health. Contributors for these Special Issues are selected from among participants in the Annual Conference on Behavior Change, Health, and Health Disparities that is organized by the Vermont Center on Behavior and Health, a National Institutes of Health (NIH) and Food and Drug Administration (FDA) supported research center located at the University of Vermont (<http://www.uvm.edu/medicine/behaviorandhealth/>). Each contribution undergoes thorough peer-review overseen by the Editor-in-Chief in coordination with the Guest Editor. Below I comment briefly on the rationale for organizing these annual conferences and associated publications as well each of the excellent individual contributions to this 2nd Special Issue.

Behavior change, health, and health disparities

The U.S. and other industrialized countries are in the process of adapting their health care systems to accommodate the increasing impact of chronic health conditions. As was discussed in the Introduction to the prior Special Issue (Higgins, 2014), these health systems evolved largely to manage infectious disease and acute illnesses. While those earlier foci remain important, the mission has had to broaden considerably to accommodate the growing influence of chronic health conditions, especially those where personal behavior is a proximal cause. This broadening of aims is illustrated well by the NIH's newly established Science of Behavior Change initiative (<https://commonfund.nih.gov/behaviorchange/index>), which identifies behavior change as an institutes-wide priority. This growing recognition of the scope of the adverse impact of behavior on health is also reflected in passage of the Family Smoking Prevention and Tobacco Control Act (<https://www.govtrack.us/congress/bills/111/hr1256>), which for the first time gives the U.S. FDA the power to regulate tobacco manufacturers (Family Smoking Prevention and Tobacco Control Act, 2009). While there has been tremendous progress in reducing cigarette smoking, it remains the single most preventable cause of chronic disease and premature death in the U.S. and other developed countries (Henningfield, 2014). Cigarette smoking is responsible for almost five hundred thousand premature deaths annually in the U.S. and five million globally. It is also a problem that is becoming entrenched within more socioeconomically disadvantaged populations and a substantive contributor to health disparities (e.g., Chilcoat, 2009; Higgins and Chilcoat, 2009).

The problem of physical inactivity and obesity is a more recent epidemic that is also having substantial adverse impacts on population health in the U.S. and internationally, with estimates indicating that it contributes to approximately three hundred thousand premature deaths annually in the U.S. and three million globally (Finkelstein et al., 2009; Trogon et al., 2008). This problem too is coming to be overrepresented among more socioeconomically disadvantaged populations, especially women (Vurbic et al., 2015—in this issue).

A final example is the growing problem of prescription drug abuse in the U.S. and internationally (Kuehn, 2007). In the U.S., abuse of prescription opioid analgesics has reached epidemic proportions, with almost two million individuals meeting diagnostic

criteria for opioid analgesic abuse/dependence and rates of overdose death exceeding rates seen with illicit drugs (Compton et al., 2015—in this issue). Prescription opioid addiction has come to represent a more substantial problem in the U.S. than globally, although it is certainly an area of concern in many developed countries (Fischer et al., 2014). As with tobacco use and obesity, the overrepresentation of prescription opioid addiction in socioeconomically disadvantaged populations is less discussed but a problem nevertheless. Disadvantaged populations are more likely to be prescribed opioid analgesics, to be prescribed them at higher doses and for longer time-periods, and are more likely to experience an overdose death (U.S. Department of Health and Services, 2013).

This Special Issue includes contributions that address tobacco use, obesity, and prescription opioid addiction. However, because the first Special Issue devoted considerable space to the topic of cigarette smoking and other tobacco use, some space to obesity and related problems, and none to the U.S. prescription opioid addiction epidemic, we made the latter a primary focus of the conference and this 2nd Special Issue, while continuing to include contributions on obesity and tobacco.

Prescription opioid addiction

The contributions on the prescription opioid addiction epidemic begin with a commentary from Dr. Wilson Compton and colleagues (Compton et al., 2015—in this issue). In his role as Deputy Director of the NIH's National Institute on Drug Abuse, Dr. Compton is directly or indirectly involved in many of the federal efforts underway to curtail this U.S. epidemic. The Compton et al. commentary provides important insights into the conditions that led to this epidemic, while also detailing important federal initiatives that have been implemented to curtail it and reduce adverse impacts; their table outlining evidence-based interventions is especially helpful for those seeking practical information.

To illustrate efforts occurring at the state level, we focus on efforts in Vermont. That choice was driven in part by convenience as the conference from which the contributions to this Special Issue were invited was held in Vermont, but also for more substantive reasons. Vermont has been impacted by this opioid addiction epidemic so substantially that the governor, Peter Shumlin, devoted his entire 2014 State of the State Address to this problem (Vermont Public Radio, <http://digital.vpr.net/post/full-audio-and-text-gov-shumlins-2014-state-stateaddress>). That bold action was part of a state-wide effort to confront the epidemic, an effort that contains elements with the potential to be helpful to other states confronting this same challenge. This is especially the case for rural states that often lack the infrastructure for managing opioid addiction, which heretofore had been mostly an urban problem. The commentary from Simpatico (2015—in this issue), Chief Medical Officer responsible for coordinating Vermont's Medicaid and other public health coverage programs, thoughtfully details the basic structure of Vermont's effort (Patient-Centered Primary Care Collaborative, <https://www.pcpcc.org/initiative/vermont-hub-and-spokes-health-homes>).

We invited two contributions on the important topic of managing opioid-dependent pregnant women and their drug-exposed neonates. The contribution of Jones and Fielder (2015—in

this issue) provides detailed current and historical information on the neonatal abstinence syndrome, including the need for proper screening, assessment and clinical management, and capacity to manage complications related to co-morbid substance abuse (cocaine, tobacco) common in treating this population. The contribution from Meyer and Phillips (2015—in this issue), obstetricians at the University of Vermont Medical Center, details how Vermont surmounted the many challenges involved in developing the professional expertise and infrastructure to effectively treat opioid-dependent mothers and neonates. Their report too is crafted with the goal of being helpful to other states currently grappling with similar challenges.

The contribution of Terplan et al. (2015—in this issue) draws attention to the point that most pregnancies among opioid-dependent women are unplanned. They review the literature on contraceptive use among opioid-dependent women with an eye towards reducing unplanned pregnancies by assisting opioid-dependent women in obtaining and using medically recommended contraceptives, especially long acting, reversible, contraceptives. This is a topic that has been grossly understudied among women with substance use disorders and has the potential for enormous positive impacts (Heil et al., 2011).

Another area where there is a striking need for improvements is the provision of medication-assisted treatment for opioid addiction. The contribution from Dr Sigmon (2015—in this issue) reviews the small but impressive literature on interim medication treatment as a method for reducing the adverse impacts of inadequate treatment services for opioid addiction. This strategy has tremendous potential for improving care in rural states and other regions where services are inadequate to meet demand leaving addicted patients on waitlists for months or even years increasing their risk for infectious diseases, overdose, and death (Sigmon, 2014; Sigmon et al., 2015).

One of the most unsettling aspects of this opioid addiction epidemic is the striking increase in overdose deaths to a level where overdose is now the leading cause of death by injury in the U.S. (Trust for America's Health and Robert Wood Johnson Foundation, 2015). The commentary by Walley (2015—in this issue) makes a compelling case for extending knowledge acquired in successful efforts to curtail the HIV epidemic to this more recent epidemic, especially with regard to borrowing the multi-faceted harm-reduction model that was so important to curtailing HIV infection among injection drug abusers. Walley identifies eight specific strategies helpful in curtailing HIV infection that have potential close parallels that could be adapted in efforts to curtail opioid addiction. They each merit consideration, but one in particular, the naloxone rescue kit, is gaining considerable recognition. Naloxone injection has been approved by FDA and used for more than 40 years by emergency medical services personnel to reverse opioid overdose (U.S. Substance Abuse and Mental Health Services Administration, https://store.samhsa.gov/shin/content/SMA14-4742/Toolkit_FirstResponders.pdf). This effort looks to make this same medication available to opioid users, their social networks and families, and across criminal justice, public safety, public health, and health care systems. As Walley notes, overdoses are estimated to cost approximately \$37, 724/incident (2009 dollars) in direct medical costs and lost productivity. When considered against the cost of overdose, there is considerable room for a policy of broad distribution of naloxone rescue kits to be cost-effective.

In a well-crafted accompanying essay, Coe and Walsh (2015—in this issue) make a sound argument for extending use of naloxone rescue kits into routine care for chronic pain patients. They also provide important details on development of more user-friendly devices for administering naloxone, associated costs, and FDA approval status. Chronic pain patients are at risk for overdose, with risk increasing as an orderly function of the opioid dose prescribed (Dunn et al., 2010). Considering the efficacy of naloxone and rapid development of user-friendly devices, their recommendation seems prudent.

Physical inactivity, obesity, cigarette smoking & other tobacco use

While the U.S. epidemic in prescription opioid addiction cries out for attention, it would be shortsighted to not continue attending to the larger ongoing obesity and cigarette smoking epidemics that continue to have devastating adverse health impacts. Contributions in our prior Special Issue reviewed national and international efforts to curtail the cigarette smoking and obesity epidemics (see Henningfield, 2014; Higgins, 2014; Kaplan, 2014). However, we did not provide a perspective from the state level in that issue, a gap that is addressed in this issue by the commentary from Chen (2015—in this issue) in his role as Vermont Commissioner of Health. Chen outlines how despite being among the healthiest states in the U.S., Vermont is confronting a substantial increase in the prevalence of physical inactivity and obesity. As is the case nationally, the epidemic is overrepresented among more socioeconomically disadvantaged children and adults. Borrowing from lessons learned in tobacco control, Vermont is implementing a multi-level effort to increase physical activity, decrease caloric intake, and promote healthier physical activity and food-choice norms throughout the state.

I contributed a commentary (2015—in this issue) reviewing how 50 years of regular U.S. Surgeon General's Reports on the health consequences of smoking was a highly effective contributor to the successes in reducing smoking prevalence in the U.S. and abroad. Comparing the rate of reports on smoking and obesity, I note a more than five-fold lower rate of Surgeon General's reports on obesity compared to tobacco. I strongly recommend leveraging the power of the U.S. Surgeon General's Office in efforts to curtail the obesity epidemic comparable to what has been done for tobacco. There are important commonalities across these epidemics and it would be shortsighted not to carefully consider where knowledge gained in one might be fruitfully extended to the other. Doing so seems so reasonable that one might think that it would occur as a matter of course. However, that assumption ignores a “silo mentality” that is still common in the health field where experts in one epidemic may be unfamiliar with the details of the effective steps taken to curtail another.

Continuing the theme of extending effective intervention models across disorders, Ades (2015—in this issue), a pioneer in the development of the efficacious and cost effective cardiac rehabilitation model of exercise, healthy diet, and lifestyle changes, advocates for a comparable model for preventing and treating Type 2 diabetes mellitus (T2DM). As a direct consequence of the obesity epidemic, there is an emerging U.S. epidemic of T2DM (Geiss et al., 2014). Substantial evidence supports the efficacy of exercise and healthy diet for preventing T2DM in at-risk patients and emerging evidence suggests that newly diagnosed

cases can be put into remission with the same intervention. Unfortunately, medically supervised programs to which providers treating this disease can refer patients are missing from the current healthcare system. Among numerous insightful recommendations for improving upon this situation, Ades notes that the network of over 2000 cardiac rehabilitation programs already available throughout the US is well suited to deliver medically supervised lifestyle programs and would be an excellent starting place for making lifestyle change available as a therapeutic option for T2DM patients.

Berkman et al. (2015—in this issue) flag another disease where the silo mentality may be blinding healthcare providers to an important opportunity to promote healthy lifestyle changes. Ductal carcinoma in situ (DCIS) is a common form of breast cancer with an excellent prognosis. However, the diagnosis and treatment experience for many women with DCIS are associated with unhealthy lifestyle changes (decreases in physical activity, weight gain, increased substance use) that can increase risk for other more lethal conditions (e.g., cardiovascular disease). This team of cancer investigators makes the compelling recommendation of widening the clinical view on this problem to include adoption of healthy lifestyle changes that are known to prevent cardiovascular disease as part of routine care for DCIS patients.

Further driving home the need to be mindful of co-morbid conditions and risk factors, Vurbic et al. (2015—in this issue) report an original study on the prevalence of co-morbid obesity and cigarette smoking in a nationally representative sample of U.S. women of reproductive age. Each of those conditions alone is overrepresented in socioeconomically disadvantaged women, and a risk factor for pregnancy complications, poor birth outcomes, and other poor health biomarkers and outcomes. Vurbic and colleagues document a robust association of socioeconomic disadvantage with co-morbid obesity and smoking in women of reproductive age, along with substantial elevations in cardiovascular biomarkers, depressive symptoms, reproductive health problems, and physical limitations compared to women with only one or neither of these problems. They underscore the need for efficacious interventions to treat this co-morbid condition, which do not currently exist.

Continuing on the theme of co-morbid conditions, Gaalema et al. (2015—in this issue) report results of a systematic literature review that thoroughly documents how cigarette smoking is associated with negative outcomes across multiple phases of the cardiac rehabilitation process. They underscore the need for renewed attention to promoting smoking cessation following treatment for coronary events including within the cardiac rehabilitation model.

Despite the substantial progress that has been made in reducing prevalence of cigarette smoking in the U.S. a great deal more needs to be done especially among economically disadvantaged populations. The contribution of Leventhal et al. (2015—in this issue) describes an innovative original study examining potential mechanisms underpinning greater vulnerability to cigarette smoking and other substance abuse among more disadvantaged youth. Taking a behavioral economic viewpoint on this problem, they provide evidence that this greater vulnerability is associated with a lower density of healthy alternative sources of positive reinforcement compared to more advantaged youth. Building upon that evidence, Leventhal and colleagues suggest that prevention programs focused on increasing the

availability of healthy alternatives for youth may be a reasonable step towards reducing these disparities. A similar evidence-based argument has also been made for reducing vulnerability to cocaine addiction (Higgins, 1997; Higgins et al., 2004). Continuing with that same behavioral economic conceptual framework, Secades-Villa et al. (2015—in this issue) review their programmatic series of clinical trials demonstrating how systematically providing alternative reinforcement to compete with substance abuse in the form of incentive-based interventions can effectively increase smoking cessation rates and cocaine abstinence.

Complimenting the observations of Leventhal and colleagues on socioeconomic status as a risk factor for cigarette smoking and other substance use, my colleagues and I (Higgins et al., 2015—in this issue) contribute a systematic literature review documenting a pervasive influence of male gender as a risk factor for tobacco use. However, the Higgins et al. review also examines how gender intersects with other risk factors including socioeconomic status, psychiatric status, race, among other risk factors for tobacco use. They offer strong evidence that these risk factors act in an independent, cumulative manner in contributing to an individual's overall risk. The Higgins et al. review also puts readers in touch with the growing array of different tobacco and nicotine-delivery products currently being used by U.S. adults and youth, including e-cigarettes. Not only must we be looking at each of these epidemics through a wide lens and be looking to borrow and extend what has worked with one to others, but we must also remain vigilant for new developments. The introduction of e-cigarettes provides an excellent example of such a development in the area of nicotine and tobacco use. The contribution of Lopez and Eissenberg (2015—in this issue) provides a highly informative overview of current scientific knowledge about e-cigarette use, the evolution and variation in e-cigarette devices, and the many associated public health and regulatory implications. They outline how e-cigarettes could represent an important positive turning point in efforts to eliminate use of combusted tobacco or a substantial impediment to that goal if they are used in addition to rather instead of combusted tobacco. These are among the challenging topics that we plan to continue examining in future conferences and publications in this series on behavior change, health, and health disparities.

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