Kaiser Permanente Research Brief

Substance-Use Disorders

This brief summarizes the contributions of Kaiser Permanente Research since 2007 on the topic of substance-use disorders, including misuse of tobacco products, alcohol, prescription medications, and illicit drugs.

The Office of the U.S. Surgeon General defines substance-use disorders as “medical illnesses caused by repeated misuse of a substance or substances, characterized by clinically significant impairments in health, social function and impaired control over substance use, and diagnosed through assessing cognitive, behavioral, and psychological symptoms.” They are neurobiological disorders that involve a complex interplay between genetics and environment, and are best treated in medical settings.

The 2016 National Survey on Drug Use and Health (NSDUH) estimated that 5.6% of Americans over age 11 have alcohol-use disorders. One in 10 Americans ages 12 and older use illicit drugs, primarily marijuana. Approximately 2.3% of Americans misuse prescription drugs, while 4.4% misuse opioid drugs. The Centers for Disease Control and Prevention (CDC) estimates that 15.1% of American adults are current smokers, while 3.4% use smokeless tobacco products. Although misuse of all these substances falls within the purview of addiction medicine, they vary with respect to the prevalence of use and use disorders - each has different risk factors, associated health risks, treatment modalities, and treatment outcomes.

Substance-use disorders are an active area of study for Kaiser Permanente Research. Scientists across the organization have published almost 500 articles related to substance-use disorders since 2007; these articles have been cited approximately 12,000 times. These articles are the product of observational studies, randomized controlled trials, meta-analyses, and...
other studies led by Kaiser Permanente scientists. Our unique environment – a fully integrated care and coverage model in which our research scientists, clinicians, medical groups, and health plan leaders collaborate – lets us contribute generalizable knowledge on substance use disorders, and many other topics of research.

Understanding Risk

Who is at risk for developing substance-use disorders?

Kaiser Permanente researchers have contributed to understanding the risk of substance-use disorders. Factors found to be associated with higher risks include younger age,5, 6 male gender,5, 6 family history,7-9 current or prior mental health problems,6, 10, 11 and use of tobacco, alcohol, or drugs at levels not meeting the criteria for use disorders.5, 10, 12, 13 These factors contribute, to varying degrees, to the risk of use disorders in all addictive substances. Familial risk factors may include genetic influences or modeling substance-use behaviors by family members.14

What other health risks do people with substance-use disorders face?

A second line of research has studied health risks faced by people with substance-use disorders. The CDC has estimated that 88,000 Americans die each year from alcohol-related causes, making alcohol the third-leading preventable cause of death in the United States.15 Risks associated with alcohol-use disorder that have been studied by our researchers include liver disease,16, 17 surgical complications,18-20 inadequate adherence to prescribed medications,21 accidents and injuries,22-24 and fetal alcohol syndrome.25

According to a recent report from the Office of the U.S. Surgeon General, smoking causes more than 480,000 deaths nationally each year, including 90% of lung cancer deaths and 80% of COPD deaths.26 Studies conducted by Kaiser Permanente researchers have linked tobacco use with risks including heart disease,27, 28 stroke,28 other vascular disease,27, 29 respiratory disease,27, 30-33 and numerous forms of cancer.27, 34-38 A recent Kaiser Permanente study also suggests that smokers may be at increased risk of opioid-use disorders.39

Risks associated with cannabis use studied by Kaiser Permanente researchers include mental health symptoms40-43 and respiratory illness.44, 45 Other studies conducted in Kaiser Permanente found that patients with marijuana-use disorder
had more co-occurring health problems, higher emergency, inpatient, and psychiatric utilization. Recent work conducted by our scientists has explored harms associated with cannabis use by pregnant women. Although data on the long-term health risks of cannabis are equivocal, persons who use this drug may be more likely to use alcohol and other drugs, and recent legalization initiatives have contributed to concern about the possible health consequences of increased normalization of marijuana use.

Data compiled by the CDC has found that use of opioid medications (particularly fentanyl and fentanyl analogs) has driven the sharply increasing rate of overdose deaths between 1999 and 2016. Misuse of opioids has been linked in Kaiser Permanente studies with risks such as overdose, soft-tissue infection, and HIV or Hepatitis C infection arising from needle-sharing practices. Kaiser Permanente research has also suggested that persons using prescription opioids are at higher risk of illicit drug use, have poorer health outcomes, and have higher health care utilization. Patients with opioid-use disorder are also more likely to have other medical problems.

Improving Patient Outcomes

What strategies are effective in preventing substance-use disorders?

Approaches to prevention or risk reduction studied by Kaiser Permanente researchers include screening and brief counseling for smoking and alcohol use and addressing early substance use before it rises to the level of a use disorder. Brief counseling prior to first use has been found to be effective in preventing use disorders and realizing superior health outcomes. Evidence regarding prevention in persons who use at risky levels is mixed, but some interventions have yielded positive results, such as smoking cessation programs combining counseling with nicotine replacement. Kaiser Permanente has studied early interventions for adolescent substance-use disorders, including two randomized trials demonstrating that screening and brief intervention for adolescents can be improved by training pediatricians or embedded behavioral health clinicians to provide Screening, Brief Intervention, and Referral to Treatment (SBIRT). Kaiser Permanente researchers were among the earliest to raise concerns about the national opioid epidemic, and have urged greater caution in long-term opioid prescribing. Our scientists have also described system changes for improving the safety of opioid prescribing, including minimizing variability between prescribed doses, redesign of primary care clinic processes and integrated monitoring using electronic health records.

What are the key factors in effective treatment of people with substance-use disorders?

Addressing Stigma. Substance-use disorders are chronic illnesses characterized by frequent relapse. Thus, engaging the patient to initiate and persist in care is critical to successful treatment. To foster patient engagement, clinicians should be careful to avoid language that stigmatizes the patient’s substance use, both in communication with the patient and with one another. One recent study called particular attention to stigma as a barrier to treatment engagement for patients with pain disorders who seek care for opioid misuse.

Medical Management. Behavioral therapy, including counseling and contingency management, is a mainstay in the treatment of all substance-use disorders. Pharmacotherapy is an important component of treatment of opioid-use disorders, and is an option for treating misuse of alcohol or tobacco. Quitlines (no-cost phone-based tobacco cessation services) and similar web-based programs
are also effective in tobacco cessation. Harm-reduction interventions to mitigate the negative consequences of substance use are another component of effective treatment. Community-based 12-step-style programs or other peer supports may also be helpful resources for persons with substance-use disorders.94-97 Research in adolescent patients has also found that continued care is associated with greater long-term abstinence in these patients.98

Translating Research into Policy & Practice

How has Kaiser Permanente research on substance-use disorders contributed to changes in policy and practice?

As part of a learning health care organization that uses research to inform and improve practice, Kaiser Permanente’s research, clinical, and operational partners have tested many interventions to reduce the risk of substance-use disorders and improve outcomes for patients with these disorders. Work on engaging patients99-101 and integrating interventions for substance use into primary care workflows66,83,85,102-106 has been adopted nationally into practice recommendations from the National Council for Behavioral Health.107 In the Alcohol Drinking as a Vital Sign (ADVISE) trial, a team in Kaiser Permanente’s Northern California region studied alcohol screening in the context of assessing alcohol use as a vital sign.108 This study has supported the design and implementation of region-wide screening and reporting, leading to millions of members being screened by non-physician clinicians for alcohol-use disorders (with physicians directing treatment referral). Work is underway to implement this program in other Kaiser Permanente regions. Additionally, the ongoing Primary Care Opioid Use Disorders

Screening, Brief Intervention, and Referral to Treatment (SBIRT)
for Alcohol-Use Disorder

Improving implementation of recommended screening and brief intervention for unhealthy alcohol use in primary care: A comparison of alternative staffing models108

<table>
<thead>
<tr>
<th></th>
<th>Physicians</th>
<th>Non-Physician Teams</th>
<th>Usual Care</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients screened for unhealthy alcohol use</td>
<td>9%</td>
<td>51%</td>
<td>3.5%</td>
</tr>
<tr>
<td>Patients who screen positive who received brief intervention &amp; referral to treatment</td>
<td>44%</td>
<td>3%</td>
<td>3%</td>
</tr>
</tbody>
</table>

Non-physician providers screened a larger proportion of their patients, but physicians were more likely to deliver the brief intervention and referral to patients who screened positive.
Notable Studies Related to Substance-Use Disorders

<table>
<thead>
<tr>
<th>STUDY</th>
<th>FUNDER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medication Use, Safety and Evidence (MUSE)</td>
<td>Food and Drug Administration</td>
</tr>
<tr>
<td>Alcohol Drinking as a Vital Sign (ADVISe)</td>
<td>National Institute of Alcohol Abuse and Alcoholism</td>
</tr>
<tr>
<td>Coronary Artery Risk Development in Young Adults (CARDIA)</td>
<td>National Heart, Lung, and Blood Institute</td>
</tr>
<tr>
<td>CONsortium to Study Opioid Risk and Trends (CONSORT)</td>
<td>National Institute on Drug Abuse</td>
</tr>
</tbody>
</table>

Treatment (PROUD) trial will explore the impact of a nurse care manager on access and adherence to medication therapy for patients being treated for opioid-use disorders.109 Kaiser Permanente researchers have also studied the documentation of e-cigarette use in the organization’s electronic health records, and have provided recommendations to improve routine screening.110

Kaiser Permanente’s regional research groups all participate in the Addiction Research Network, a National Institute on Drug Abuse (NIDA)-sponsored initiative aimed at expanding access and improving the quality of addiction treatment by enhancing its integration with general medical care. Kaiser Permanente researchers also work as investigators and collaborators in numerous national research initiatives. Kaiser Permanente researchers have led or collaborated in several notable studies related to the risks, prevention and treatment of substance-use disorders (see table below).

A great deal of work has focused on addressing stigma in the care of patients with substance-use disorders, and changing the broader culture in caring for this population. One Kaiser Permanente study assessed the experiences of patients entering addiction treatment facilities and found substantial opportunities for process improvements to lower barriers to treatment entry.111 Other Kaiser Permanente researchers have studied clinician-reported barriers to the adoption of evidence-based opioid treatment,103,112 and one team has studied patient preferences for pharmacotherapy for opioid-use disorder.113

Collectively, research from Kaiser Permanente authors has been cited 60 times within recent consensus statements and clinical practice guidelines published by a wide range of entities, including the CDC,114 the Departments of Defense and Veterans Affairs,115 and the Washington State Department of Labor and Industries.116 In addition, Kaiser Permanente researchers and clinician scientists have directly contributed as authors of a 2013 American Heart Association guideline,117 and of two systematic reviews undertaken for the U.S. Preventive Services Task Force.63,71

Kaiser Permanente’s nearly 170 research scientists and more than 1,600 support staff are based at 8 regional research centers and 1 national center. There are currently more than 2,400 studies underway, including clinical trials. Since 2007, our research scientists and clinicians have published more than 12,000 articles. Kaiser Permanente currently serves more than 12 million members in 8 states and the District of Columbia.

This brief was written by Anna C. Davis, Nicholas P. Emptage, and Elizabeth A. McGlynn. It is available online from share.kp.org/research/briefs. The authors wish to thank the following researchers for their contributions to the development of this brief: Katharine Bradley, Bobbi Jo H Yarborough, and Constance M Weisner.
References


2. Substance Abuse and Mental Health Services Administration Center for Behavioral Health Statistics and Quality. *Key substance use and mental health indicators in the United States: Results from the 2016 National Survey on Drug Use and Health*. Rockville, MD: Center for Behavioral Health Statistics and Quality, Substance Abuse and Mental Health Services Administration;2017.


