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CFAR Substance Use Research Core (SURC) Faculty Publication and New Awards Digest

New research on HIV and substance use by our SURC faculty.

If you have any other publications or awards, please send them toNatalia Gnatienko to include in the next publication digest!

Please remember to cite CFAR support (P30AI042853) on your future publications!

Visit the SURC webpage

Announcements

Sabrina Assoumou Named an Extraordinary Woman Advancing Healthcare
Sabrina Assoumou, MD, MPH, attending physician in infectious diseases and SURC faculty, has received an Extraordinary Women Advancing Healthcare Award from The Women's Edge. The award recognizes ten outstanding individuals for their career achievements demonstrating collaboration, mentorship, innovation, and fostering diversity in their organizations and in the healthcare community.

SURC New Investigator Meet-and-Greet
The SURC will host a virtual meet-and-greet event on Tuesday, November 29th from 11am-12pm to connect new HIV/substance use researchers with faculty across our institutions. If you are an early stage investigator looking to connect with others working in the field of HIV and substance use research, please contact Natalia Gnatienko.

New Grants

Gabapentin to Reduce Alcohol and Improve Viral Load Suppression - Promoting "Treatment as Prevention"
1R01AA030460-01 (Samet, Jeffrey; Lunze, Karsten) 9/20/2022 – 6/30/2027

Ending the HIV epidemic requires achieving HIV viral load (HVL) suppression among key populations. Unhealthy alcohol use by people with HIV (PWH) is a barrier to reaching HVL suppression at multiple stages of the HIV care cascade. Alcohol use is common among PWH and results in lower antiretroviral therapy (ART) adherence and HVL suppression,

mitigating the effectiveness of Treatment as Prevention (TasP), a key strategy for preventing HIV transmission. Treating alcohol use is therefore a mechanism to support PWH with unhealthy alcohol use along the HIV care cascade. In fact, prior studies demonstrate that interventions to reduce alcohol use positively impact HIV outcomes. Gabapentin is efficacious for decreasing alcohol consumption and may be an effective treatment for painful conditions, such as HIV-associated sensory neuropathies. However, gabapentin's role in achieving HVL suppression in this population has not been established. Our hypothesis is that effective pharmacological alcohol treatment (i.e., gabapentin) will help PWH engage in HIV care, adhere to ART, and achieve HVL suppression. We propose Gabapentin to Reduce Alcohol and Improve Viral Load Suppression (GRAIL), a randomized, double-blinded, placebo-controlled clinical trial to evaluate the efficacy of gabapentin vs. placebo to achieve HVL suppression among PWH. The study population will be people living with HIV who drink heavily and have had a detectable viral load at least 6 months after their HIV diagnosis. Participants (N=300) will be randomized 1:1 to receive either gabapentin (1800mg/day target dose) or placebo for 3 months; both arms will employ a one-time brief intervention to reduce alcohol use. GRAIL aims to 1) test the efficacy of gabapentin versus placebo to achieve undetectable HVL at 3 months (primary outcome) and at 6 & 12 months (secondary outcomes); and 2) to assess the impact of gabapentin compared to placebo on: a) alcohol consumption, b) pain severity, c) self-reported ART adherence, and d) engagement in HIV care, in order to explore potential mechanisms by which gabapentin may lead to HVL suppression. This study will take place in Uganda, in a context of unhealthy alcohol use and HIV. Our multi-disciplinary team has an extensive track record of successfully conducting randomized clinical trials, including pharmacological trials (e.g., gabapentin) in PWH. Uganda, a setting in which HIV and heavy alcohol use are more prevalent than in the US, will enable efficient study of intervening on alcohol use among PWH. The knowledge gained will be applicable to populations living with HIV in the US and globally. The proposed trial of gabapentin is significant as it employs a TasP approach to prevent transmission of HIV by targeting alcohol use and achieving HVL suppression. If shown to be effective, this highly generalizable pragmatic approach to TasP can be implemented in a variety of clinical settings, thus making it a practical addition to the HIV prevention toolkit.

New Publications

Spillover benefit of pre-exposure prophylaxis for HIV prevention: Evaluating the importance of effect modification using an agent-based model. *Epidemiol Infect*. 2022 Oct 28:1-31. Epub ahead of print.
Buchanan AL, Park CJ, Bessey S, **Goedel WC**, Murray EJ, Friedman SR, Halloran ME, Katenka NV, **Marshall BDL**.

We developed an agent-based model using a trial emulation approach to quantify effect measure modification of spillover effects of pre-exposure prophylaxis (PrEP) for HIV among men who have sex with men (MSM) in the Atlanta-Sandy SpringsRoswell metropolitan area, Georgia. PrEP may impact not only the individual prescribed, but also their partners and beyond, known as spillover. We simulated a two-stage randomized trial with eligible components (≥3 agents with ≥1 HIV+ agent) first randomized to intervention or control (no PrEP). Within intervention components, agents were randomized to PrEP with coverage of 70%, providing insight into a high PrEP coverage strategy. We evaluated effect modification by component-level characteristics and estimated spillover effects on HIV incidence using an extension of randomization-based estimators. We observed an attenuation of the spillover effect when agents were in components with a higher prevalence of either drug use or bridging potential (if an agent acts as a mediator between ≥2 connected groups of agents). The estimated spillover effects were larger in magnitude among components with either higher HIV prevalence or greater density (number of existing compared to all possible partnerships). Consideration of effect modification is important when evaluating the spillover of PrEP among MSM.

The relationship between substance use and physical activity among people living with HIV, chronic pain, and symptoms of depression: a cross-sectional analysis.

AIDS Care. 2022 Oct 19:1-12. Epub ahead of print.
Cherenack EM, **Stein MD**, Abrantes AM, Busch A, Pinkston MM, Baker JV, Uebelacker LA.

Chronic pain, depression, and substance use are common among people living with HIV (PLWH). Physical activity can improve pain and mental health. Some substances such as cannabis may alleviate pain, which may allow PLWH to participate in more physical activity. However, risks of substance use include poorer mental health and HIV clinical outcomes. This cross-sectional analysis examined the relationships of self-reported substance use (alcohol, cannabis, and nicotine use), gender, and age with self-reports of walking, moderate physical activity, and vigorous physical activity, converted to Metabolic Equivalent of Task Units (METs), among 187 adults living with HIV, chronic pain, and depressive symptoms in the United States. Women reported less walking, vigorous activity, and total physical activity compared to men. Individuals who used cannabis reported more vigorous physical activity relative to those who did not use cannabis. These findings were partially accounted for by substance use*gender interactions: men using cannabis reported more vigorous activity than all other groups, and women with alcohol use reported less walking than men with and without alcohol use. Research is needed to increase physical activity among women who use substances and to evaluate reasons for the relationship between substance use and physical activity among men.

Use of pre-exposure prophylaxis (PrEP) to prevent rapid HIV transmission among people who inject drugs (PWID) in rural counties in the United States: A modeling study. *J Acquir Immune Defic Syndr.* 2022 Sep 23. Epub ahead of print.
Jacka BP, Nolen S, Bessey S, Zang X, **Goedel WC**, Yedinak J, **Marshall BD.**

Background: Despite recent HIV outbreaks among people who inject drugs (PWID) in nonurban US settings, syringe service programs (SSP) are often inaccessible in these communities. Furthermore, pre-exposure prophylaxis (PrEP) awareness and coverage for PWID is limited. We aimed to model the impact of PrEP on HIV transmission among PWID in a rural setting.
Setting: Using a calibrated agent-based model, we simulated HIV transmission in an adult population (n=14,573 agents) in Scott County, Indiana between 2021 and 2031.
Methods: We modeled PrEP eligibility according to CDC guidelines for PWID. PrEP coverage increased by 15% points in the range 10%-70%. Two counterfactual scenarios were modeled: Unrestricted access for PWID and PrEP for SSP attendees. We calculated the number of new HIV infections and number of person-years on PrEP per averted infection (PYPAI).
Results: In the status quo scenario 153 (95% Simulation Interval: 85,259) new HIV infections occurred among PWID over 10 years. Compared to the status quo, 40% PrEP coverage resulted in 25% fewer HIV infections in the Unrestricted access for PWID scenario and 10% fewer HIV infections in the PrEP for SSP attendees scenario. The PYPAI was 21 and 43 in the Unrestricted access for PWID and PrEP for SSP attendees scenarios, respectively.
Conclusion: Our modeling suggests that PrEP provides substantial benefit to PWID in rural US communities, with fewer restrictions on access providing the greatest effect. Control of HIV outbreaks will require expansion of public health interventions that meet the needs of all individuals.

Alcohol and falls among people with HIV infection: A view from Russia and the United States. *Alcohol Clin Exp Res*. 2022 Sep;46(9):1742-1752. PMCID: PMC9509482.
Kim TW, Heeren TC, **Samet JH**, Bertholet N, Lloyd-Travaglini C, Winter MR, Magane KM, Gnatienko N, Bryant K, Rateau LJ, Muyindike WR, Hahn JA, Blokhina E, **Saitz R**.

Background: Both human immunodeficiency virus (HIV) infection and alcohol use predispose to autonomic/sensory neuropathy, imbalance symptoms, and cognitive impairment-conditions associated with a greater risk of falls-yet it is unclear how to identify people with HIV (PWH) whose drinking is associated with falls. Research on alcohol and falls using the same instruments in different countries could help to specify the level of alcohol use associated with fall risk. We examined whether a consumption-based measure (the Alcohol Use Disorders Identification Test-Consumption [AUDIT-C]) and/or a

symptom-based measure (DSM-5 criteria for alcohol use disorder [AUD]) are associated with sustaining a fall among PWH in St Petersburg, Russia and Boston, Massachusetts in the United States.
Methods: Separate multivariate logistic regressions were used for each cohort to examine cross-sectional associations for each alcohol measure predicting fall. Potential confounders included physical functioning, depressive symptoms, and other substance use (measured with the Addiction Severity Index).
Results: A fall was reported by 35% (87/251) of the sample in Boston and 12% (46/400) in St Petersburg. Each additional AUD criterion-but not higher AUDIT-C score-was significantly associated with a fall in both Boston (odds ratio [OR] = 1.10; 95% confidence interval [CI] 1.02, 1.18) and St Petersburg (adjusted OR AOR = 1.10; 95% CI 1.02, 1.18). Heavy alcohol use (>6 drinks/occasion, any vs. none) was associated with more than twice the odds of a fall (AOR = 2.24; 95% CI 1.21, 4.13) in Boston.
Conclusions: These findings suggest that while fall risk may vary by setting and population, heavy alcohol use and AUD symptom severity are potential targets for interventions to prevent falls. Studies in diverse global settings advance our understanding of the relationship between alcohol and falls in PWH.

A smoking cessation mobile app for persons living with HIV: Preliminary efficacy and feasibility study. *JMIR Form Res*. 2022 Aug 18;6(8):e28626. PMCID: PMC9437787. Schnall R, Liu J, Alvarez G, Porras T, Ganzhorn S, Boerner S, Huang MC, Trujillo P, **Cioe P**.

Background: The prevalence of smoking in the United States general population has gradually declined to the lowest rate ever recorded; however, this has not been true for persons with HIV.
Objective: We conducted a pilot test to assess the feasibility and efficacy of the Lumme Quit Smoking mobile app and smartwatch combination with sensing capabilities to improve smoking cessation in persons with HIV.
Methods: A total of 40 participants were enrolled in the study and randomly assigned 1:1 to the control arm, which received an 8-week supply of nicotine replacement therapy, a 30-minute smoking cessation counseling session, and weekly check-in calls with study staff, or to the intervention arm, which additionally received the Lumme Quit Smoking app and smartwatch.
Results: Of the 40 participants enrolled, 37 completed the follow-up study assessments and 16 used the app every day during the 56-day period. During the 6-month recruitment and enrollment period, 122 people were screened for eligibility, with 67.2% (82/122) deemed ineligible. Smoking criteria and incompatible tech were the major reasons for ineligibility. There was no difference in the proportion of 7-day point prevalence abstinence by study arm and no significant decrease in exhaled carbon monoxide for the intervention and control arms separately. However, the average exhaled carbon monoxide decreased over time when analyzing both arms together (P=.02).
Conclusions: Results suggest excellent feasibility and acceptability of using a smoking sensor app among this smoking population. The knowledge gained from this research will enable the scientific community, clinicians, and community stakeholders to improve tobacco cessation outcomes for persons with HIV.

Emotional reactions to high-risk sex among sexual minority men: Exploring potential opportunities for just-in-time intervention. *J Sex Res.* 2022 Sep 13:1-10. Epub ahead of print.
Wray TB, Emery NN, Guigayoma JP.

Rates of HIV and other sexually transmitted infections (STIs) are high among sexual minority men (SMM). A large body of research has explored determinants of HIV/STI risk behavior, but few studies have explored emotional consequences of these events. Understanding the valence, timing, and strength of emotional reactions to sexual risk could inform use of specific behavior change techniques in interventions (such as anticipated regret) and identify new opportunities for intervention, including just-in-time interventions. We analyzed data from an ecological momentary assessment (EMA) study of 100 HIV-negative/unknown-status SMM to understand patterns of positive affect, negative affect, shame, and stress in the 24 hours after sex. Mixed-effects models showed

that the probability of negative affect was higher in the hours following condomless anal sex (CAS) with high-risk partners during which SMM reported being under the influence of alcohol or drugs (A/D involved CAS), versus all other types of sex events (OR = 0.92, SE = 0.03, p = .017). The probability of shame was also higher after A/D-involved CAS, versus other sex events (OR = 1.14, SE = 0.07, p = .035). Findings suggest that the hours following A/D-involved CAS events may be an opportune time to intervene to help SMM avoid similarly aversive experiences in the future.

Factors related to smoking and perceptions of a behavioral counseling and messenger service-delivered smoking cessation intervention for people with HIV in China: Qualitative study. *JMIR Form Res*. 2022 Oct 12;6(10):e35923. PMCID: PMC9607887.
Yang S, Huang J, Ye L, Lin J, Xie Z, Guo B, Li Y, Liang B, Zheng Z, **Lunze K**, Abdullah AS, Liang H, Quintiliani LM.

Background: China, where half of the adult male population smoke tobacco, has one of the highest global burdens of smoking. Smoking rates are even higher among people with HIV. People with HIV can be affected by smoking in multiple ways, including more severe HIV-related symptoms and worse antiretroviral therapy treatment outcomes. However, smoking cessation services targeted for people with HIV are not routinely integrated into HIV care in China. Given the widespread mobile phone ownership, an exploration of factors related to smoking among people with HIV in China who smoke could inform the design and implementation of mobile smoking cessation interventions that target the needs of this vulnerable population.
Objective: This study aims to explore the perspectives of smoking, barriers and facilitators to quitting, and perceptions related to a smoking cessation intervention delivered through behavioral counseling sessions and brief daily messenger service (WeChat)-delivered messages.
Methods: We recruited people with HIV from the People's 4th Hospital of Nanning, Guangxi, China, and conducted semistructured face-to-face interviews. All interviews were audio-recorded, transcribed verbatim in Chinese, and translated into English for data analysis. We conducted a thematic analysis using a codebook, which was guided by a team-based consensus approach to identify 5 main themes. We also explored themes according to the demographic groups.
Results: A total of 24 participants were enrolled in the study. The mean age was 37.2 (SD=13.5) years. The participants had lived with HIV for a mean of 2.4 years. The majority were male (18/24, 75%) and lived in urban or metropolitan settings (19/24, 79%). We identified five main themes: variable knowledge of the harms of smoking, both related and unrelated to HIV; willpower perceived as the primary quitting strategy; a duality of the effect of social factors on quitting; perceptions about optimal features of the smoking cessation intervention (eg, messages should be brief and most frequent during the first few weeks); and the largely negative impact of their HIV diagnosis on smoking behaviors. In addition, some themes differed according to participant demographic characteristics such as age, sex, and education level.
Conclusions: We identified barriers to and facilitators of smoking cessation among people with HIV in China by conducting semistructured qualitative interviews. Owing to the adverse impact of smoking on HIV outcomes, targeting cessation interventions to the unique needs and preferences of people with HIV in China may be needed to increase the effectiveness of future interventions. A pilot clinical trial will be conducted in the future to evaluate this behavioral counseling and brief daily messenger service (WeChat)-delivered messages approach among people with HIV who smoke in China.
