NIDA International Forum – June 24, 2021 (Day 3)

STEVE GUST: Let me officially welcome everybody to the NIDA International Forum. This is our third day and our third session, and today we decided to try to have some more participatory activities and invite you all to come and give us brief presentations on your research and your research findings, so again thank you for that. I will do the introductions and we'll get started right away. and I think I learned how to pronounce João's name a few minutes ago.

So we're going to start off with João Mauricio, who is current NIDA invest fellow with Dr. Silvia Martins at Columbia University. He's an auxiliary professor of psychiatry at the ABC University Center in São Paolo, and on Tuesday he received the award for Excellence in Clinical Work by a Postdoctoral Researcher at the CPDD Early Career Research Presentation Competition, so we're very excited and proud of you for that. His presentation is Substance Use in Mild COVID-19 Patients, a Retrospective Study.

JOÃO MAURICIO: Thank you so much, Steve. Your pronunciation is very good, I just say that. You learn it quickly. Today I'm going to present on substance use in mild COVID patients. It's a retrospective study with Brazilian sample of patients. In this study, we aim to investigate the difference between pre- and post-COVID substance use. If pre-COVID substance use was associated with increased symptoms and also with specific symptoms, or if COVID-19 severity was associated with post-COVID substance use. And finally, if we had change between pre- and post-COVID substance use in terms of any kind of associations or new paths through the disease.

In this study, we are using a sample of almost 1,000 individuals who are classified as mild cases. We reached a little bit more than half of all the patients who were followed in a middle-sized Brazilian city, and we were able to assess all the CDC COVID symptoms during the active phase of the disease, which could be up to 14 days. And we did a unique online survey in which we assessed frequency of substance use in three different time points: the month before COVID, the month just after COVID, and the month just before the survey. And we used a different statistical analysis depending on the aims of the study because we had different outcomes.

What did we find? We found that the levels of alcohol and tobacco decreased in the month just after COVID, and the levels of no medical use of analgesics increased in the month just after COVID, which is a little bit intuitive. And these levels went back to the pre-levels in the case of no medical use of analgesics and tobacco. For alcohol, it went back to a level which is intermediate between pre- and post-COVID but higher than the post-COVID period.

We were not able to find any association between previous levels of substance use and symptoms of COVID or severity. We also didn't find any association between COVID severity and post-substance use, which were aims 2 and 3. However, in the aim 4, we found here that all the previous use of substances were associated with post-use of a given substance and found new paths in which we found people who previously used alcohol, various levels of alcohol use were associated with post-levels of no medical use of analgesics. The previous level of no medical use of analgesics were associated with most levels of benzodiazepines and also cannabis, and previous levels of tobacco was similar to post-levels of cannabis and also pre-levels of benzo with post-levels of no medical use of analgesics. In summary, we had new paths for cannabis, no medical use of benzodiazepines, and no medical use of analgesics.

In conclusion, we didn't find specific associations between previous substance use and COVID symptoms or severity, which was our main question, and neither associations between COVID severity and post-substance use. However, it's important to educate people for prevention of no medical use of analgesics during the more active phase of COVID, and more importantly, to increase the perceived risks of cannabis, no medical use of benzodiazepines and no medical use of analgesics in the post-COVID period, because we had especially these people who are at risk, which are the previous substance users, at risk for new paths for this substance use. Thank you for my collaborators, for my funders, and also the City of São Caetano.

GUST: Thank you very much. Just a quick question about your plans to do any district follow-up surveys. People are talking about the long-term effects of COVID and so forth.

MAURICIO: We are just following-up these people, not only for substance use but also for depression and anxiety, which is something which is really a hot topic right now. So the answer is yes, and we don't have many results yet, but we are doing it.

GUST: Very good. Thank you so much. Our second speaker is Anna Goodman, who is a Research and Policy Analyst at the Canadian Center on Substance Abuse and Addiction, where she focuses on impaired driving, cannabis, and youth substance abuse prevention. And the title of her talk today is Canadian Perceptions and Experiences with Virtual Services and Supports for Substance Use.

ANNA GOODMAN: Good morning everyone or good evening or good afternoon. Thank you, Steve, for having me here today. Today I'm going to be presenting some results from a mixed-method study that we just completed at CCSA. Before I get started, I want to quickly acknowledge the partnership that made this possible. We had folks from the Royal Ottawa Mental Health Center, Canadian Psychological Association, as well as Canada Health Infoway.

What did we do? Back in May 2020 we had a need identified by many of our partners regarding a gap in data in terms of this switch from in-person services to virtual care. A lot of our folks were using substances or experiencing substance use disorder or concurrent disorders. They had that very rapid switch to virtual care offered to accommodate COVID-19 restrictions, and it was very important for us to understand how this switch was going. How are people receiving this new technology? Are there certain groups that might be left behind with this switch? And how are practitioners experiencing this switch as well.

Our objectives were to understand both how the clients using virtual care were receiving it and how our practitioners were experiencing it. And we wanted to look at virtual care on a large spectrum, so we looked at everything from texting and apps and going online and accessing education through to virtual treatment through your phone or Zoom or whatever it might be all the way through some really innovative programs that were being delivered online, such as harm-reduction programs, so we wanted to ensure that this was included fully.

We ended up conducting a quantitative survey. We had over 1,000 people living in Canada that responded. Only about 300 of them were using virtual services for these reasons. And then we spoke to the general public at large to see if this was something that they would be interested in using in the future in case we want to scale these services up further. And we also did 14 interviews with practitioners who were delivering virtual care.

What did we find? We had 2/3 of the clients being satisfied with the services, but only 48% said they would prefer to remain using virtual services; the rest of them wanted to go back to in-person care. And this was echoed in our qualitative findings as well. Those practitioners delivering the virtual care felt that it's not as effective as in-person care and that's understandably related to having that rapport, getting those physical and social cues, and creating that connecting between client and practitioner.

We knew technology was going to be a large theme, and this did come up in both the quantitative and qualitative results. We found those people who are more comfortable with technology were more likely to be comfortable with virtual care, so not surprising but important to consider those that maybe aren't as technologically advanced who might not be as happy with this switch. And our practitioners also reported a very steep learning curve for both clients and themselves once they moved to virtual care.

We asked about barriers to accessing services or to using virtual services, and these very much varied based on gender, race, age, and geography. For example, our women were more likely than men to be less satisfied with virtual care, so we had women expressing that they wanted to go back to the in-person care, whereas men were a little more comfortable with remaining virtual.

Age came out as a huge factor as well. Those aged 34 to 54 were more likely to report privacy as a barrier to virtual care, so we figured this might be because you have children at home or roommates or whatever it might be. Those over the age of 55 were less likely to think they could build a relationship with a healthcare provider virtually, so they had less faith in creating that relationship online.

A big theme that came out with our practitioners was that certain populations aren't able to access virtual care in the same way. We're thinking marginalized, those who don't have access to the internet, those remote world folks might be left behind in this switch.

I'll end with our implications of this work. Post-pandemic we really want to ensure that we have a hybrid approach, so offering both in-person and virtual services and making sure we're looking at different ways of tailoring our programs based on demographics and maybe considering or investing in providing technology and internet to certain populations. Thank you.

GUST: Thank you. Could you say a word about how or if the type of service delivered might have impacted the satisfaction levels?

GOODMAN: A lot of folks reported different types of service use—we had folks using both their phone and their online. I think some of the older populations were less likely to use apps and more technologically advanced things, and then we had the younger folks more comfortable with using video, so again based on the demographic would vary.

GUST: What do you see as the future of this? So much of what we've done over the last year and a half, every aspect of life, has become virtual. Do you see a growing future? I would assume so, but what are your thoughts on that?

GOODMAN: That certainly was one of the key reasons we were asked to collect this data is we have certain governments invested in scaling this type of thing up. We talk a lot about the fourth wave or whatever it might be regarding mental health and increase in substance use and are we going to need creative ways of providing these services to those who need them the most? And I think there is a lot of use in providing these services further, even beyond COVID.

GUST: Very good. Thanks a lot. Next presentation is by Sarah Moreheart who is a doctoral student in the Faculty of Health Sciences at Simon Fraser University, where she is evaluating innovative and low-threshold health and social support models for sex workers, and the title of her paper today is Changes in Illicit Drug Supply During COVID-19: Findings of Community-Based Cohort of Women Sex Workers in Metro Vancouver.

SARAH MOREHEART: Thank you. Good morning, good afternoon, good evening. I love that introduction.

GUST: I think we're probably 15 time zones.

MOREHEART: I love it. Thank you for having me here. Today I'm presenting preliminary work on the impacts of the COVID-19 pandemic and the opioid poisoning epidemic on overdose prevention and risk among sex workers in Vancouver. To begin, I just wanted to quickly acknowledge the study participants and community collaboratives for their contribution to this research as well as current and past researchers and staff, studies supported by the US National Institutes of Health. I also wanted to acknowledge that I'm speaking to everyone today from the traditional unceded territories of the Matsqui, Kwantlen, and Katzie first nations.

I'm drawing on cross-sectional data from a novel COVID supplementary questionnaire that was asked of participants enrolled in an open-perspective community-based cohort of over 900 indoor, street-based, and online sex workers called AESHA that's been running since 2010. Eligibility inclusion includes women, cis and trans inclusive, age 14 and older; have exchanged sex for money in the last 30 days. Recruitment, retention, interviewing is done by outreach via a frontline team comprised of former and current sex workers as well as community-based staff. The COVID supplement was developed to quickly capture the experiences of sex workers during the pandemic amongst questions around health, safety, and changes to working conditions. We also asked questions related to sex-worker substance use.

Our study objective was to investigate patterns and associations with experiencing negative changes to illicit drug supply amongst sex workers who used drugs during COVID. Bivariate and multivariate logistic regression was used to investigate correlates of negative changes to drug supply.

When referring to our outcome variable of reporting negative changes to illicit drug supply, we're describing reports of changes which respondents identified as unwanted or harmful to their usual supply of illicit drugs. These changes may be the availability of illicit drugs, the quality of the illicit drugs, or the accessibility of illicit drugs. A major consequence of both COVID and the ongoing opioid poisoning epidemic is that the illicit drug supply market is tainted. People simply do not know what's in the drugs that they're buying in the illicit market. This outcome is important, as it reflects the increased risk women sex workers face in their consumption of illicit drugs. These negative changes could lead to decisions to accept or consume drugs that are potentially more harmful in conditions and contexts that are potentially more dangerous. It also highlights the interventions and measures put in place to mitigate drug-related harm are poorly equipped to respond to the needs of women and sex workers.

A total of 179 sex workers completed the supplement between April 2020 and April 2021, with over 60% of respondents reporting a negative change to their illicit drug supply. Just over 20% had accessed government-regulated prescription Safer Supply. At the bivariate level, we saw statistically significant associations between the outcome and reports of accessing overdose-prevention sites, experienced barriers to health care in the last six months, and injection drug use in the last six months.

In multivariate analysis, higher odds for reporting negative changes to illicit drug supplies common amongst women who inject drugs, as well as those reporting barriers to health care. Marginally higher odds were associated amongst women accessing overdose-prevention sites.

We're still learning about the gendered experience of sex workers and substance users during COVID. We do know that criminalization and displacement of sex workers contributes to minimal health care access and that sex workers are disproportionately overrepresented amongst people who use drugs. Additionally, the tailored gendered impacts. Needs of women sex workers in harm reduction and other health and safety related spaces are not considered, as these spaces and supports tend to be male-oriented and are especially dangerous for women facing the overlapping stigmas of substance use and sex work.

In the context of COVID, many sex workers have had their incomes decimated and their access to health and social supports severely reduced or eradicated. Sex workers and women who use drugs are profoundly impacted by ongoing criminalization of both sex work and punitive drug policy.

Our results showed that an alarmingly high proportion of sex workers used drugs, experienced negative changes to illicit drug supply during COVID. Mitigating the negative impacts of the overlap in public health crises requires critical investment in sex-worker and women-led interventions. Informed policy recommendations should recognize that sex workers and women who use drugs are informed in risk mitigation and are making use of services like overdose prevention sites and drug check-in services, despite these sites not being well-adapted to their needs. Opportunities should be seized to integrate drug-user informed scaleup and integration of prescription Safer Supply and overdose prevention sites, as this also represents a moment to reengage in health care. Thanks for your time and your interest in our community-based study. We're going to continue to examine these impacts to provide evidence-based and calling for further community-based and peer-led services and interventions that directly impact our communities.

GUST: Thank you very much. One question occurred to me. What was the exact timing of the survey and what's your sense of what might be happening as the pandemic is fading over time?

MOREHEART: Great question. Prior to this, I was the Research Coordinator for that study. As soon as we heard in Vancouver, B.C. where I'm based, March 14th was when public health announcement was around COVID. I spent the next two weeks developing this supplement. So we got it up and going and started asking our participants virtually these questions I believe April 6. So we did one year of collection from that date. Post-COVID, we're still in the throes of an opioid-poisoning epidemic.

Here in the province of B.C. in Canada where I'm based, we have five to six deaths a day still happening. There was a slight dip in that number of deaths per day in 2019, but come 2020 we were still seeing the impacts. What that's really saying, and I know this is familiar to everyone in this room, is that the drug supply is tainted. People simply don't know what's in the drugs that they're buying. The government here in Canada and B.C. has kick-started this prescription Safer Supply, but there are major problems around being able to access it, the availability of drugs on it that are available to people, and people—the level of stigma for people who are using substances, we're missing huge swaths of the population, so I don't see this problem going away.

GUST: Thank you very much. Next speaker is Ada Beselia, who is a Research Assistant at the Addiction Research Center Alternative Georgia, where she focuses on harm-reduction approaches, drug use in nightlife settings, young recreational users, new psychoactive substances, and gambling. And the title of her talk today is Monitoring An Online Illicit Drug Market During COVID-19 in Georgia. Welcome, Ada.

ADA BESELIA: Hello, everybody. I'm happy that I have an opportunity to present study findings with you all which was about monitoring online illicit drug market during COVID-19 in Georgia. Matanga is a major online illicit drug market that offers a wide selection of psychotropic drugs for procurement in Georgia. The purchased drugs can be collected at specific locations as a dead drop in five cities in Georgia, as you can see on the map. The aim of our study was to examine trends in illicit drug sales on Matanga during COVID-19 restrictions.

As for our methodology, locally developed software was used to monitor and record transactions on Matanga over the period of April-September 2020, for six months. And the software consisted of two parts—scraper and exporter. The server and the scraper each hour collected all the relevant product information and the data was cleaned manually and grouped in unique categories of substances, information that was not relevant for drugs, so it was filtered and deleted, for example announcement for career and so on.

As for results, 22,000 sale transactions were made during this period, and total revenues exceeded $4.5 million. Nineteen categories of substances were offered and sold during these six months, and the average number of daily transactions was 132. Cannabis product sales accounted for the highest volume of sales and for the largest numbers of transactions as well, as you can see on the graph. And after cannabis, cocaine was the most often sold substance and was followed by MDMA/ecstasy.

In terms of revenues, cannabis was followed by cocaine and methadone, and methadone largely in crystal form. MDMA/ecstasy, heroin, alpha-PVP, methamphetamine and NBOMe were also sold in relatively large amounts. Daily offers and daily sales were roughly equal throughout this period.

Unfortunately, we don't have data about monitoring illicit drug markets during periods that we can compare to COVID period time.

To conclude, despite COVID-19 related restrictions, the Matanga platform was actively used to purchase drugs in Georgia. And for limitations, since the scraper software went hourly, it would potentially miss transactions if the product was placed for sale and was actually sold within the single hour. It was also not feasible to track for discounts that were given to individual customers as dealers offered some discounts to regular customers who had at least five episodes of buying drugs on their website.

Also the Matanga market discontinued from June 23 on its old address and our research team was able to identify a new address by July 14, so the data presented did not include transactions between June 23 and July 14. Thank you for your attention and thank you for your questions.

GUST: This website, Matanga, this is an illicit website, correct? I'm curious how it can operate. Was it shut down by law enforcement?

BELESIA: No, actually it's not a Georgian website. It's mostly Russian-language and there are some product names also in English, but it's not Georgian, so Georgian law enforcement is unable to do anything against it.

GUST: I see. I noticed it looked like there was a large peak in sales in August. Any thoughts as to why?

BELESIA: Yes, in August there were large transactions, but unfortunately we don't know reasons for this. And in July, for example to compare, was the lowest transactions and we are unable to explain those results.

GUST: And how are the drugs delivered?

BELESIA: In advance it's hidden in some location, for example, in forests outside the city or somewhere, or in old buildings, and after payment users get the exact coordinates of photos where their drugs are hidden and they go and collect their drugs there.

GUST: Very interesting. Very nice paper. Thank you so much. Our next speaker is Judith Ferrer- Alarcón, who is a psychologist with the Mexican Observatory of Mental Health and Drug Use at the National Commission Against Addictions. And her talk today is Drug Use Patterns in Mexico During the COVID-19 Pandemic. Welcome, Judith.

JUDITH FERRER-ALARCÓN: Hi, everybody. I'm Judith. Let me tell you about my study. Due to the COVID-19 pandemic, the Mexican government implemented preventive measures to reduce rates of contagion; however, self-isolation brought changes in patterns of drug use, given the barriers to trafficking and the increased risk perception of drug use. The aim of this study was to describe the drug-use patterns in Mexico from the declaration of the COVID-19 pandemic.

We worked with 17,267 people, mainly women. The study was made in collaboration with the Inter-American Drug-Abuse Control Commission. We used a self-administered survey remotely through the Survey Monkey platform. We shared the survey in the 32 states of Mexico.

The results showed since the pandemic began 48.3% of the participants worked or studied at home; 39% of the participants must go to work. In drug use, people indicate that in the last year they have consumed alcohol, tobacco, and marijuana. In addition, 59% of illegal drug users report that they had stopped their drug use during self-isolation. And although 14% of the participants stopped marijuana use, 10.4% increased marijuana use. On the other hand, in the participants who increased drug use, their reasons for increased drug use were anxiety, stress, and self-isolation measures.

In addition, 5.4% of the participants mentioned it was hard for them to get their drugs; 9.6% of the participants obtained illegal drugs. In conclusion, the pattern of alcohol and tobacco use remained the same while the use of illegal drugs decreased. However, the proportion of people who increased their use of alcohol, tobacco, and marijuana. Likewise, anxiety, stress, and self-isolation were the main causes for people to resort to drug use during the pandemic.

With the challenge in helping people control their emotions and other situations that lead to drug use. In the context of COVID-19, it will be important to help the users control their emotions of self-isolation. Thanks.

GUST: Thank you very much. Is there a plan to do another survey or continue this survey?

FERRER-ALARCÓN: Yes, we will make the survey in September/October this year and compare the results.

GUST: Good. I look forward to hearing more about your data in the future. Thank you very much. Our next speaker is Dr. Basma Damiri, an Associate Professor at the National University in Palestine where she coordinates the Master's Degree program in clinical research. And the title of her talk today is Depression Among Medical and Non-Medical Students and Its Association With Cognitive Enhancers and Psychostimulants Use During COVID-19 Quarantine.

BASMA DAMIRI: Hi, everyone. I am Ahmed Farhoud talking on behalf of Basma Damiri.

GUST: Yes, Ahmed, welcome.

FARHOUD: University students experience higher rates of depression compared to the general population, and that was observed here in Palestine and it was mentioned in several international publications. Due to social and political problems, the use of cognitive enhancers and psychostimulants is highly prevalent among Palestinian population in general and university students in particular. However, depression among cognitive enhancer and psychostimulant users was an underrecognized and neglected health issue in previous national studies targeting university students. Therefore, this study aimed to investigate the prevalence of depression and its association with cognitive enhancers and psychostimulants among university students in West Bank Palestine during the COVID-19 pandemic.

We focused in this study on comparing the differences between medical and non-medical students in terms of prevalence of depression, severity of depression, and the frequency and pattern of cognitive enhancers and psychostimulant use. As for our results, cigarette smoking was highly prevalent among university students, with about 39.3% of males were smokers. And it was also associated with all levels of depression—severe, moderate and mild. It was mostly associated with severe depression.

Tobacco-alternative products such as water pipe and e-cigarettes and energy drink consumption were all highly prevalent among university students. We observed male predominance in tobacco and energy drink consumption; however, the gender gap between males and females in water pipe smoking was narrower than that in cigarette smoking.

No association was found between depression, water pipe, e-cigarettes, energy drinks, coffee, tea, and chocolate.

Medical students were less likely to have severe depression compared to non-medical students. Moreover, males were less likely to have moderate depression and mild depression when compared to females.

Finally, the most prevalent motivations for substance use were curiosity for cigarette smoking and energy drink consumption. Fun for water pipe smoking. Increasing wakefulness and improving vigilance and attention for energy drinks, coffee, and tea consumption. About 10% of smokers chose COVID-19 as a motive for smoking.

To conclude, overall, the results to his study revealed a high prevalence of depression and detrimental effects of smoking on university students. Moreover, they suggest an urgent need to address depression and its risk factors among Palestinian university students by educating students about mental health, identifying high-risk students, and offering easily accessible psychological health.

Finally, our results prompt the need to broaden the spectrum of future studies to include students from various academic fields instead of only focusing on medical students. Thank you for listening.

GUST: Thank you, Ahmed. I want to commend you for doing a very nice study during difficult times. What's going on now? What are your future plans in terms of doing this kind of research on substance use in the students?

FARHOUD: I think we will conduct similar research after the resolution of COVID-19 era so that we can compare the results during COVID-19 and post-COVID-19. And that will give us more definitive answers about the exact effect of COVID-19 on cognitive enhancers and psychostimulant consumption.

GUST: Thank you very much. Our next speaker is Adrian Abagiu, who is a long-time friend of the NIDA International program. He's a former NIDA Humphrey Fellow and is currently senior physician in the Infectious Diseases at the Romanian National Institute for Infectious Diseases and Medical Coordinator of the ARENA Opioid Maintenance Therapy Center. And the title of his presentation is Why Are Injecting Drug Users and Patients in Methadone Substitution "Protected" From SARS CoV2 Infections?

ADRIAN ABAGIU: Thank you, Steve. Hello to everybody. Already after the first six months of the COVID pandemic we have seen that far less patients in methadone maintenance or attending needle-exchange programs were infected with COVID-19. So in November 2020, at the ISAM virtual meeting, I have asked many other participants and they say that this was seen also in other countries. So for the 11 months of the pandemic in Romania, with a population of a little more than 19 million, we have prevalence of COVID-19 registered cases about 3.7%. In Bucharest, where more than 95% of the problematic drug users are settled, we had even higher prevalence with 5% of COVID-19 cases, but this is also that more tests were done in our capital where a lot of the laboratories for detecting PCR are situated.

Looking in the 1,600 patients in the nine methadone centers in Bucharest, and we have methadone centers, sadly, only in Bucharest, we have a prevalence of 0.87% and in the clients reaching the needle-exchange programs, which were for the 11 months almost 3,000 individuals, the prevalence was 1.2%, so at least four times less than in general population. In the general population, we have almost 54% women affected, but the death toll was almost 16% in men and with very few cases in special population for women. Women are representing 24% of the patients in methadone maintenance and 43% among men.

Analyzing in the COVID-19 cases, we had the methadone dose we see that 96% of them were on lower doses, less than 60 mg, and analyzing patients attending needle-exchange programs, of the people who got ill, almost 2/3 were on both heroin and neuro psychostimulant. Actually, they are most on psychostimulants, but they use heroin to sleep and were only on neuro psychostimulants.

So I was able to think for an explanation for this situation. Looking at the letter to the editor of the European Journal of Psychiatry in the beginning of 2021, a letter written by L. Attademo and F. Bernardini, two Italians who have shown they were discussing the neuronal patho-physiology in COVID-19 infection, and they have shown that there is a significant link based on gene co-expression and co-regulation and thus function between the Angiotensin I Converting Enzyme 2, the ACE2, which is encoding the main receptor for the spike of COVID-19, and Dopa Decarboxylase, DDC, encoding the enzyme that catalyzes the biosynthesis of dopamine, serotonin and histamine.

Furthermore, it was shown that these two co-express and co-regulate also in non-neuronal cell types. And it was found that in patients with Parkinson's, which are characterized by dopamine deficiency, they have found fewer cases of SARS-CoV-2 infection, actually like in children who also, because they have

fewer ACE2 receptors, are less infected. Or in people with drug dependence, it is well known that there is a significant depletion of dopamine receptors not only at brain level and the dysfunction of serotonin and its metabolite melatonin. So I think this is why it is protective affect because they also have less SARS-CoV-2 receptors, and this is why we can explain the prevalence. Thank you.

GUST: That is very, very interesting work, and I want to make sure I understand what you're saying. You're saying in general drug users and others, Parkinson's patients, for example, who show reduced levels of dopamine, reduced receptors, are at reduced risk because of this interaction in the regulation.

ABAGIU: Also have reduced numbers of ACE2 SARS-CoV2 receptors. They are co-regulated.

GUST: Is anybody looking at any other ways of reducing dopamine function, for example, as a way to prevent or treat SARS? This sounds extremely provocative and important. I don't know how one would do that because most of the drugs that I'm aware of would increase dopamine function, not decrease it.

ABAGIU: They increase it in the beginning of use. After that, you have depletion, decrease. Most of our patients are after a year of using heroin or methadone or both almost at the same time.

GUST: And I think you said you heard this is happening in other countries?

ABAGIU: Yes. I have put this question, why do we have fewer cases, and no one was able in the ISAM meeting to answer, so ...

GUST: This sounds like a topic worthy of follow-up. I look forward to ... It would be nice to see a multisite study of this to see these results elsewhere. Very interesting. Thank you very much, Adrian. Our next speaker is Colleen Dell, who is a professor at the Centennial Enhancement Chair in Health and Wellness at the University of Saskatchewan, where she examines how the human/animal bond can help enrich wellness among individuals and communities and settings, including addiction treatment facilities, criminal justice institutions, and universities. And the title of her talk today is Examining Changes in Post-Traumatic Stress Disorder Symptoms and Substance Use Among a Sample of Canadian Veterans Working With Service Dogs: An Exploratory Longitudinal Study. Hello, Colleen, and welcome.

COLLEEN DELL: Hello. Thank you so much, Steve. I want to start by acknowledging the land and any animals you might have around you, such as your dogs, your spouse, and your being here. I wish to have EJ with me—he's a service dog in training—but it's really early here in Saskatchewan, Canada, so he's sleeping and I didn't have the heart to wake him up, so I'm here alone.

These are my research questions. Do AUDEAMUS, and this is the service dog organization that I work with that EJ is actively being trained through, do AUDEAMUS service dogs assist veterans diagnosed with PTSD in addressing problematic substance use? And if yes, how so, accounting for both the bond that individuals have with the dog as well as the task that the dogs are trained to perform?

For those who are not aware, service dogs are trained to perform a variety of tasks for veterans with PTSD symptoms such as, for example, waking a veteran out of a nightmare. And a lot of the veterans we know who are diagnosed with PTSD are at elevated risk for problematic substance use, so that's where we have put our emphasis.

This study that I'm going to talk to you about is a patient-oriented project. It involved a really large team made up of veterans, service dog trainers, students, researchers, and so forth, and all of us were

involved in training a service dog in some way. I trained a full service dog. Unfortunately, he passed and now I'm training a new one, and that's really important to our team that we get the best understanding that we can.

Data was collected with five veterans over a one-year period. We measured substance use in PTSD at six points—baseline, 1, 3, 6, 9, and 12 months. And our research addresses a criticism in the literature that is there is not enough quantitative method, so we did a mixed method, quant and qualitative. And note that research continues to emerge in this field. It's a really huge field.

Our analyses included a Reliable Change Index and descriptive statistics for the PCL-5 and the DUSI and a content analysis for one-on-one structured interviews. Reliable Change Index is useful for measuring clinically significant changes as well as statistically significant changes when you have a small sample size. The PCL-5 is a PTSD checklist for the Diagnostic and Statistical Manual and the DUSI revised version is a drug use and screening inventory revised scale, which most people here are aware of.

GUST: Colleen, the research slide is still up.

DELL: Sorry! Thank you. Comparing baseline and one-year means for the PCL-5 and DUSI—and what we put up here was the DUSI Behavior Pattern Subscale, because it measures PTSD symptoms similar to PCL, so we just put this one up here as well—and we found that the Reliable Change Index affects the high scores suggested a clinically significant decrease in v scores and symptoms. And our interviews complemented these findings. Three of the five veterans reported change in their PTSD symptoms—fewer nightmares, less hypervigilance, and more focus—as a result of their service dog.

Looking at the DUSI, which might be of more interest to everyone here, the DUSI revised substance abuse scale changes were not significant, as you can see on the graph here using Reliable Change Index. But during the interviews, the veterans reported a decrease in the use of opioids and alcohol while some reported increase in their medical cannabis use, which some would argue is not necessarily a bad thing if opioid use was going down.

So veterans also shared—and this is important to note—how service dogs sometimes contributed to an increase in their PTSD symptoms and related symptoms and substance use, but this is specifically early on when they are bonding with their dog, and for some of them, they were training with the dog. So this did come down, but sometimes there were increases in the beginning.

Overall, service dogs can be a complement for treatment—at least we're starting to find that—and there are some benefits to veterans diagnosed with PTSD. I think the challenge is going to be using some of the standardized instruments, because they don't really get at what's happening between that veteran and that dog, and that's where the interviews really come in and we start to recognize the importance of that bond of a non-judgmental support, some say spiritual growth or even starting to speak to moral injury because you have somebody, a living being, that is not judging you and you are connecting with when the veterans are so disconnected from society.

So we definitely need more research, and again, not just looking at the technical skills that the dogs do, which are amazing, but also that bond that the veterans have with them. And then also starting to interview (and we have started) spouses and service providers and family members of the veterans to get a more holistic understanding of the impact of these dogs in their lives and their families as well.

GUST: Thank you. Do you have other projects underway or planned?

DELL: It's interesting, because I think what I'm seeing now being in this area for seven years, we also offer dog programs in prisons with prisoners who have substance use disorders, we work in lots of different environments, and I'm seeing more and more the same things coming out amongst the different populations. So where I see this going is pulling a lot of that together and the future vision is also looking at the role of companion animals in the lives of individuals who are struggling with problematic substance use because it's not just a trained animal, but it's our relationship with animals and our relationship with the environment, so a much more holistic look at wellbeing for humans.

GUST: Thank you. And thank you so much for getting up so early. I think you get the award for the group today. Our next speaker is Dr. Daniela Ocaña-Gordillo, who is a former NIDA Humphrey Fellow from Ecuador. She's working on her Master's Degree through the International Program in Addiction Studies, which we heard about on Tuesday. Daniela is currently a US-based sociologist at the Parametria Consultancy. And the title of her talk is Correlates of Marijuana Use Problems in a National Sample of Female Ecuadorian Students. Welcome, Daniela.

DANIELA OCAÑA-GORDILLO: Thank you, sir. Good morning to everyone, good night, any time of the day or night we are. First of all I would like to acknowledge also Dr. Wendy Kliewer, who worked with me in this study. Both of us were hard working at this. Thank you so much. I'm going to talk right now about correlates of marijuana use and problems of use in a national sample of female Ecuadorian secondary-school students. This was conducted in 2016. It was a nationally representative sample with more than 34,000 effective surveys.

The methodology was a self-reported questionnaire and it was representative for all capital cities and cities with more than 30,000 inhabitants, and only for the urban area. It was comprised of a population of students from 11 to 18 years of age. The measures that were taken into account were lifetime use of marijuana and problematic use of marijuana with six questions. We also assessed for first factors, ease of access to marijuana, peer substance use related to alcohol, tobacco and marijuana. Promotive factors were assessed for parental monitoring, familial engagement and perceived security around schools.

We conducted several statistical operations. First of all, for lifetime marijuana use we conducted a binary logistic regression where we had important contributions and independent contributions for age, ease of access to marijuana, friends' tobacco use, friends' marijuana use, parental monitoring and perceived security, which of course was important to take in account for considering it's a population that is vulnerable because of gender and because of the age of the population.

For problematic use of marijuana, aside from the other variables that we were analyzing in lifetime use, the sole contribution was that frequent use of marijuana in the past year and a greater number of friends who use marijuana were the two variables that predicted problematic use of marijuana. And we also took in account for logistic regression age and frequency as covariates.

As you can see in here, what is interesting about this study was that once the girls started using marijuana independently of the age, the sole predictor for problematic use was peer use of marijuana and also, of course, frequency, but that's something that is obvious.

To talk about key results of the study, the risk of ever having used marijuana was associated with factors at different levels, although age was not a specific factor to take into account. Influence of risk and

promotive factors did not differ by age, which was also a finding that was interesting. And then what I already said, once girls begin marijuana use, peer use was the sole predictor for the problematic use.

We also saw that there were several limitations for the study. Of course it was because of the cross-sectional design, which limited how to establish how in time the variables behave. There was also a weak parental monitoring scale, which we had to construct with different indicators. And also there were not considered other key factors for marijuana use and problematic marijuana use like trauma exposure, adverse childhood experiences, or promotive factors like emotion regulation and other variables like this.

All in all what we concluded is that if once girls have started using marijuana, it is important to invest and generate interventions that can generate preventive scenarios for girls that will be specific to their needs and what they will experience about substance use and specifically for marijuana use. That is the results of the study and I want to thank you for your time and your patience.

GUST: Thank you very much. How is marijuana used there? In the US obviously we have a lot of smoked marijuana, but the vaping is occurring a lot and using the concentrated forms of cannabis. I know in many parts of the world marijuana is often mixed with tobacco, which doesn't occur a lot in the US. What's the major form of use there?

OCAÑA-GORDILLO: The major form is smoked marijuana. The survey itself assesses just for smoked marijuana. But we're talking about 2016, so now we have evidence or reports, most qualitative, that they also have marijuana through edibles. Now that the regulation changed in Ecuador there is more use of oils, but in a recreational way, not in a medicinal way. And also obviously probably drug use that is marijuana with basuco or cocaine-based paste and cigarettes.

GUST: Very good. Very nice, sophisticated piece of work. Congratulations. Our next speaker is Martin Agwogie, who is a very long-time friend and participant in NIDA programs. Welcome and hello. Martin is a former NIDA Humphrey Fellow and a Distinguished Humphrey Leadership Fellow from Nigeria. He is the founder and Executive Director on the Global Initiative on Substance Abuse, a nongovernmental organization that coordinates training on universal prevention curriculum in Nigeria, as well as substance abuse treatment, capacity building and policy. And he's going to speak to us today about Implementing and Evaluating the Universal Prevention Curriculum to Promote Capacity Building Among Drug Demand Reduction Practitioners in Nigeria: Lessons Learned and Future Directions.

MARTIN AGWOGIE: Thank you very much, Steve, and good day everyone. Thank you for joining us. There are gaps in knowledge and skills of addiction practitioners worldwide and the development of the Universal Prevention Curriculum (UPC) is one of the efforts to address these gaps. So this study is the first report on the implementation of the Universal Prevention Curriculum to Promote Capacity Building Among Drug Demand Reduction Practitioners in Nigeria.

The aims of the study were fivefold: To consider the feasibility of implementing the Universal Prevention Curriculum for Substance Abuse Disorders among drug reduction practitioners in Nigeria. Determine whether training objectives were met. Determine whether the program was delivered as designed. Analyze connections between Wenger's Community Practice model and essential components of the implementation process. And assess the trainer proficiency.

Three instruments were developed for this study: the pre- and post-knowledge assessment developed by UPC national trainers in Nigeria; post-training survey that included open-ended questions; and trainer proficiency survey.

Participants were selected based on interest among drug demand reduction practitioners in Nigeria and between March 2019 and March 2020, 202 practitioners participated in the six-day training conducted in ten cohorts.

The results from Table 1 shows that participants cut across different fields with education having the highest number of participants. And Table 2 shows that the difference between the pre- and post-course means shows about 6.5 and effect size of 2. And Table 3 shows the evolution of training modules, a minimum of 4.5 on the maximum scale of 5, and the trainers registered a minimum of 80% from the domains that we measured.

What can we conclude from this? 194 out of 202 or 96% who participated in the training completed both the pre- and post-tests and the mean difference between baseline scores and those observed following training demonstrate objective gains in foundational knowledge. All participants agreed that the curriculum was implemented as designed, objectives met, and the course is relevant to their practice. And all facilitators ranked “proficient” (more than 76%) in subject knowledge, ability to engage participants in the learning process, supervision of the training environment, time management, and demeanor. That shows how effective the training of trainers was for the facilitators. And the training also demonstrated essential components of Wenger’s Community of Practice model.

In conclusion, the practitioners in this study work in varied professional environments and come from locations that include diverse ethnic groups across Nigeria with very different languages and traditions. And they all agreed upon the relevance of the training demonstrates the feasibility of implementing a standardized curriculum of substance use prevention in Nigeria.

These are my contacts, and once again thank you for your attention and it’s a pleasure seeing you again, Steve and my friends. Thank you.

GUST: Thank you, Martin. Could you comment on the status of the implementation of the UPC in Nigeria?

AGWOGIE: Thank you very much. At the time we collected the data the COVID-19 pandemic has not come, so since that time we have move on to online facilitation model and we are also going to evaluate how effective that will be. We also have a platform through which we monitor participants to see how they are putting into practice the knowledge and skills gained from this experience. And we also use the platform to share the experience, challenges, and the way forward. Thank you, Steve.

GUST: The final speaker this morning is Dr. Salman Shahzad, who is another former NIDA Humphrey Fellow. He is currently Associate Professor at the Institute of Clinical Psychology at the University of Karachi, Pakistan. And the title of his presentation today is Urdu Translation and Psychometric Properties of Perceived Stigma of Substance Abuse Scale (PSAS) in Patients With Substance Use Disorders in Pakistan. Welcome, Salman.

SALMAN SHAHZAD: Thank you, sir, and good to see you again. Good evening, everyone. From Pakistan it’s good evening but the rest of the world it is different times. My topic of presentation is the Urdu

Translation and Psychometric Properties of Perceived Stigma of Substance Abuse Scale (PSAS) in Patients With Substance Use Disorders in Pakistan. The objective of my study was to translate and adopt the PSAS, perceived stigma of substance abuse scale, into Urdu language and determine its psychometric properties.

First of all, the translation process was a forward and backward translation. The second phase was to conduct the study and perceive the reliability and validity of this perceived stigma of substance abuse scale. In this study, the total participants were 200 male patients with substance abuse disorders and the mean age was 29 years. The measure that we used in this study was the consent form and the personal information from perceived stigma of substance abuse scale, self-esteem scale, and multidimensional perceived social support scale. And all these scales were in the Urdu language.

In the procedure we obtained the approval letter from the IRB and then the selection of the treatment centers, especially towards the purposive sampling technique we used, the informed consent we included, and ethical considerations going forward, and the administration of all the males in this study should be applied in this study.

The findings you can see, especially for the descriptive information of the study variables you can see the highest education level of the participants was 10th grade was the most, 82%. The participants were up to the 14-grade level. And regarding the type of the substance, here in Pakistan according to the UNODC drug report, people were using cannabis mostly, but unfortunately now the methamphetamine is now entering the market and most people are using methamphetamine too. but in this study, the heroin was used was high, 39% of the participants, and the second was the polydrug user, the multidrug user. And then it was almost the most hash and the methamphetamine were almost the same level, 11%.

The findings of this study you can see regarding the reliability for the PSAS was 0.76. It is adequate when we can see that this is a reliable tool to be used in Pakistan with the Urdu-speaking patient with substance use disorder. And the reliability was significant again at 0.1 level. And regarding the validity, you can see a significant relationship with the self-esteem as well as the multidimensional perceived social support.

With these preliminary findings, we can say that the PSAS had a significant relationship with the self-esteem and perceived social support in male patients with substance use disorder. Regarding the discretionary implications, these findings have implications for the mental health experts, the substance use treatment, as well as the experts and the general physician to relieve the stigma and discrimination which ultimately will improve the mental health and quality of life of the patient with substance use disorders, as well as their families.

Regarding the prevention field and the treatment perspective, these findings we can use to develop evidence-based intervention for the prevention science. The culturally sensitive practices we can design which should be centered in the stigma reduction and to improve the mental health, including self esteem and social support and the wellbeing of patients with substance use disorders.

You can see here in this study why I used the stigma. Here in Pakistan mental health patients have been discriminated, and again, if the person with the mental health problem or the substance use problem it doubles the stigma related to these issues. The people, even the family members, don’t accept the

person if they find that their family member, their loved one, is using drugs. So it is so painful for them, and due to this ...

Thank you so much. Thank you. This is overall the findings of my study. Thank you so much for listening to me and for your patience. Thank you.

GUST: Thank you, Salman. What are your immediate future plans? This is fantastic groundwork for doing additional research going forward, and I'm wondering if you have any specific plans or you think you're going to try to use the translational work to create the instruments and hope they get used in the future?

SHAHZAD: This morning I was in a meeting with Sardar Massod Khan, the president of Azad Jammu and Kashmir here in Pakistan. We had some wonderful seminar and meeting. We need to develop certain interventions. At the universal level, we need to deliver certain training courses at the university level, at the community level. And these are the programs that we want to establish, especially for the anti-stigma. We like to do the mental health and the substance use. And thus we can expand these studies, not only the translation but also to expand these studies at the tertiary-level, hospitals, and even we long to train the LHVs, what we call lady health visitors and lady health workers. And the PSAS label finally helped train professionals. They are not immune to the stigma. They themselves stigmatize the patient with the substance use disorders, the moralizing and all these things.

We want to train those people to hear in the SDGs it is mentioned that we cannot treat the substance use problem separately. So mental health and substance use problems with general health issues we need to incorporate all these things. Especially we have the plan especially in the northern part of Pakistan to develop these. And especially we are working on similarly the family-based intervention, especially for the children who are suffering from substance use disorder. And if those children who have been taken from the streets and they have been traumatized and stigmatized. So we are planning to conduct some studies especially for the children and adolescents with the stigma related and mental health issues.

GUST: Very good. Thank you. Despite the fact that I think we're spread across in I think 15 time zones in this panel, we've managed to all hold together and actually come in with a few minutes remaining in our time, so I want to thank everyone for keeping on time, for making extremely excellent, informative presentations very concisely. I think this is a model that I was wondering if it would work, had some concerns that it might not work well, but I think it worked fantastically well. I hope you all agree.

And we have a minute or two if anyone has a comment or question that they would like to make, you can do so at this time. Otherwise, we can bring the session to a close. Yes, Lisa.

LISA JORDRE: I want to say to the newer faces in our audience you may have heard us talk about the Humphrey Fellowship program, the INVEST Fellowship program, and if you are not familiar with the fellowship opportunities that are available, I recommend that you go to the NIDA International Program's website and look at the postdoctoral fellowship opportunities, the Humphrey Fellowship opportunities for mid-career, and see what might fit within your experience that you might have the opportunity to spend a year or a couple of years in the US as a postdoctoral fellowship or a year as a Humphrey fellow. So I encourage you all to look at that. If you email or have questions, usually I'm the one who's responding to your email under the umbrella of the NIDA International Program, so Ahmed

and Judith, Ada, and I don't want to miss anybody's name, but if you're interested in looking at that opportunity, please look at that website, send us an email to ask questions and look at that possibility.

I don't speak any other languages. I am only an English-speaker, so I always am impressed with the language abilities that you have. Never feel worried about your level of English when you're looking at these opportunities and don't let that be something that would hold you back, because I notice everybody has that strong skill, so I just wanted to make that a point. So look at our fellowship opportunities.

GUST: Yes, thank you, Lisa. Also, not only for yourself but for your colleagues. We like to think all the friends of NIDA International are good recruiters for our fellowship programs around the world, so keep it in mind in the course of your professional duties and your research. I want to again thank everybody very much, and hopefully we'll be able to meet in person next year.