THE DEPRESSION CURRICULUM: PRIMARY CARE, CASE-BASED TRAINING ON CARING FOR ADOLESCENTS WITH DEPRESSION FROM SCREENING TO PHARMACEUTICAL MANAGEMENT

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Purpose: Although 10% of U.S. children and adolescents have functional impairment from a mental health disorder, fewer than 20% of these youth receive care. To address this gap, pediatricians must possess the knowledge necessary to diagnose and treat depression. However, little formal mental health training currently exists within pediatric programs. We implemented and evaluated a depression curriculum designed to improve resident knowledge and confidence in diagnosing and treating adolescents with depression within the primary care setting.

Methods: A case-based curriculum was implemented to simulate care, from screening to medical management, of the depressed adolescent. Four teaching sessions occurred during the Adolescent Medicine (AM) rotation. Through facilitated small-group case discussions and roleplaying, topics on signs/symptoms of depression, diagnostic criteria, validated screening tools, non-pharmaceutical interventions, initiating medication, and ongoing medical management are explored. Participants are recruited using convenience sampling of pediatric residents on the AM rotation. A de novo, anonymous, 5-point Likert scale, retrospective pre-post survey was administered to assess residents’ self-reported knowledge and confidence to diagnose and treat adolescent depression. Demographics include year of training and residency track. Covariates include past experience with child/adolescent psychiatry (CAP) and prior exposure to initiating and managing depression medication in the resident’s continuity clinic and the AM rotation. Paired t-tests were used to evaluate change in resident mean self-reported knowledge and confidence scores. This IRB approved study will occur between March 2017 and February 2018.

Results: A total of 23 residents have been eligible to participate and 16(70%) completed all the study components. Of the participants, 2(12%) were post-graduate level (PL) 1, 10(63%) PL2, and 4(25%) PL3 or higher. The majority (81%) were categorical pediatrics, 14(88%) had no formal CAP experience, 10(63%) had never initiated depression medication in primary care, and 11(69%) reported application of learning during their AM rotation by initiating medication. However, only 1 of the 11(9%) had patient follow-up to assess effect of pharmaceutical interventions during the AM rotation. Resident self-reported knowledge significantly improved from the pre to post education with respect to 1) validated screening tools (2.6 to 3.7, p<.001); 2) diagnostic criteria for depression (2.8 to 3.8, p<.001); 3) safety assessment (3.1 to 4.0, p=.002); 4) non-pharmacologic management (2.6 to 3.8, p<.001); 5) medication initiation (2.2 to 3.6, p<.001); 6) medication management (2.0 to 3.3, p<.001); and 7) mental health service collaboration (2.5 to 3.4, p<.001). Resident confidence significantly improved with 1) using validated screening tools (2.8 to 4.2, p<.001); 2) applying diagnostic criteria (2.9 to 4.1, p<.001); 3) performing safety assessments (3.1 to 4.0, p<.001); 4) non-pharmacologic management (2.8 to 3.9, p<.001); 5) initiating medication (2.0 to 3.8, p<.001); 6) managing medication (2.1 to 3.4, p<.001); and 7) collaborating with mental health services (2.6 to 3.6, p<.001).

Conclusions: These preliminary results suggest that case-based training on adolescent depression during the AM rotation can improve resident knowledge of and confidence with diagnosing and managing
depression in adolescents. We are hopeful that this could lead to improved mental health access for youth, but additional study is warranted.

**Sources of Support:** CCHMC Division of Adolescent and Transition Medicine (Colburn).

25.

**REACHING OUT TO YOUTH ABOUT TRAUMA: ADOLESCENT RAPID SCREENING VALIDATION PILOT**
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**Purpose:** Background: Despite high global prevalence rates of adolescent trauma exposure and increasing evidence of lifelong health impacts, screening for trauma in adolescent health care settings is inconsistent. Purpose: To identify an effective rapid screen for post-traumatic stress disorder (PTSD) symptoms in a group of diverse, immigrant and underserved early adolescents by comparing brief PTSD symptom screens validated for use in adult primary care settings to a longer questionnaire validated with children.

**Methods:** This pilot study examined the accuracy of two brief trauma screening tools, the PTSD Checklist 2 (PCL-2) and the Primary Care PTSD Screen for DSM-5 (PC-PTSD) to identify youth experiencing symptoms of trauma, compared with a longer tool validated for use with adolescents (PTSD Reaction Index for DSM 5). Screening tools were administered to 77 youth (ages 12-15 years) at three school-based health centers (SBHCs) in Northern California with a high proportion of low income and immigrant clients. Only youth who had already been screened for depression, trauma and substance use at their SBHCs and offered behavioral health services, if indicated, were recruited for the study. Average scores, ranges and standard deviations were compared for youth who scored above and below clinical cutoffs on the PTSD Reaction Index. Sensitivity, specificity, positive and negative predictive values (PPV and NPV) and likelihood ratios were calculated. Focus groups were conducted to obtain qualitative feedback on the screening questions. Equal numbers of boys and girls participated in screens: 64% were Latino, 13% African American, 16% Asian/Pacific Islander, and 8% Other

**Results:** In this sample, 8% met DSM-5 criteria for PTSD. Analyses revealed that the PC-PTSD demonstrated high sensitivity (100%) and specificity (83%) with adolescent clients when using a cutoff score that was slightly lower than that recommended for adult populations. Similarly, the PCL-2 demonstrated high sensitivity (83%) and specificity (85%) when using a lower cutoff score. Both tools also had high NPV (100% PC-PTSD and 98% PCL-2), but low PPV (33% and 31% respectively). During focus group discussions, youth noted several questions that were difficult to interpret or were not specific to youth who had been traumatized. Participants endorsed the importance of reaching out to youth who had been traumatized, felt questions about frequency of symptoms were harder to answer than yes-no about symptom presence, and disputed that questions related to sleep, inattention, fighting, and being on guard were only specific to youth who had experienced trauma.

**Conclusions:** Both the PCL-2 and the PC-PTSD screens had good sensitivity and specificity, but youth may be answering these screening questions without understanding them fully. Studies are needed to refine questions to develop a more effective short screen and to compare results with culturally sensitive, recommended or validated depression, anxiety and substance use screens in order to disentangle
Symptom clusters. Future research also needs to recognize that the synergy of community-trauma and individual trauma may be so prevalent that it overshadows individual adolescent perceptions and ensure that screening tools address this contextual issue.

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26.

THE RELATIONSHIP BETWEEN SCHOOL-LEVEL FACTORS AND ADOLESCENT STUDENT WELL-BEING: CROSS-SECTIONAL FINDINGS FROM THE INCLUSIVE TRIAL.

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Purpose: Well-being can be defined as 'a multidimensional construct incorporating mental/psychological, physical, and social dimensions'. In adolescents, higher well-being has been related to better mental and physical health, and educational attainment. Furthermore, these effects appear to continue into later life. For adolescents, a large part of their social interactions and personal development occur within the school environment. School size, quality, and demographics are likely, therefore, to impact student well-being. This UK study aims to investigate the relationship between school-level characteristics and student well-being.

Methods: INCLUSIVE is a 3-year (2014-2017) cluster randomized controlled trial (RCT) aimed at 11-16-year-olds in 40 secondary schools (N= 5,960 students) in England. Data from the baseline survey were used to assess school-level characteristics in relation to well-being. Well-being was assessed using the (Short Warwick-Edinburgh Mental Wellbeing Scale: SWEMWBS). School-level factors assessed were school type (voluntary, community, academy-converter, academy-sponsor, and foundation), school size, mixed/single-sex schools, the proportion of students with free school meals (FSM; a measure of deprivation), school performance (Ofsted rating), and student's overall academic attainment ('Value Added' (VA) scores). Statistical analysis was performed using an intention-to-treat approach and multi-level models to account for school-level clustering, and adjusting for gender, IDACI scores, and ethnicity.

Results: In multilevel models, at the school level, school type and school quality measures were associated with well-being: community and academy-converter schools reported lower student well-being scores than voluntary schools ((-1.71(C.I.= -2.42, -1.01)) and (-1.16(-1.78, -0.54)) respectively, p<.001). No difference in well-being was reported between voluntary, academy sponsor schools, and foundation schools. Compared to mixed-sex schools, students in all-girl schools reported higher levels of well-being (1.11(0.66, 1.57), p<.001). No difference was found between mixed-sex and all-boys schools (0.15(-0.46, 0.76), p=0.63). Compared to schools with an 'excellent' Ofsted rating, those whose rating 'requires improvement' reported lower wellbeing (-1.14(-1.74, -0.55), p<.001). Schools with higher 'value added' school grade scores showed higher well-being (0.02(0.00, 0.03), p=0.01). No difference was found in relation to school size, or the proportion of students with FSM.
Conclusions: School quality measures, such as Ofsted ratings and 'Value added' scores, are strongly associated with student wellbeing in secondary-school students in England. These findings suggest that school environment interventions may be effective for improving well-being in adolescents. Furthermore, students at single-sex girls schools reported higher well-being than mixed-sex or all-boys schools. Single-sex education may, therefore, be beneficial to overall well-being in adolescents.

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27.

PREVALENCE OF SUICIDE IDEATION, PLANNING, AND ATTEMPTS AMONG ADOLESCENTS IN 83 DEVELOPING COUNTRIES, 2003–2016
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Purpose: Suicide is a global issue, affecting individuals across the lifespan. Annually, approximately 800,000 people die from suicide. In 2015, 78% of suicide deaths occurred in low- and middle-income countries. Adolescents and young adults are a critical population to target regarding suicide prevention. While suicide was the 17th leading cause of death among all age groups in 2015, it was the 2nd leading cause of death among those age 15–29 years. The burden of youth suicide is significant, with an estimated 20 million life-years lost worldwide. Suicide behavior is influenced by social, psychological, cultural, and other factors, resulting in variation in prevalence across countries. The Global School-based Student Health Survey (GSHS) allows for a global comparison of suicide behaviors among adolescents.

Methods: The GSHS, a surveillance system supported by the World Health Organization (WHO) and the Centers for Disease Control and Prevention, measures health-risk behaviors using self-administered questionnaires among large, national samples of students aged 13–15 years. A standardized scientific sample selection process, common methodology, and core questionnaire modules were used. During 2003–2016, 83 developing countries from 5 WHO regions conducted a GSHS and included at least one of three questions assessing suicide-related behaviors during the 12 months before the survey. Students were asked if they seriously considered attempting suicide (suicide ideation), made a plan about how they would attempt suicide (made a suicide plan), and attempted suicide. Each country included in this study had at least a 60% overall response rate, which is a product of the school and student response rates.

Results: Across the 83 countries, the median prevalence by WHO region of suicide ideation ranged from 12.4% (South East Asia) to 19.4% (Africa), making a suicide plan ranged from 12.3% (Western Pacific) to 22.2% (Africa), and attempting suicide one or more times ranged from 11.3% (South East Asia) to 17.4% (Africa). The prevalence of suicide-related behaviors also varied by sex and by countries within regions.

Conclusions: Suicide risk varies by region and country. By region, the highest prevalence estimates were consistently found for Africa. The GSHS provides many countries with their only source of cost-effective country-wide data to assess youth suicide risk. GSHS data can be used to develop priorities, establish programs, and advocate for resources related to suicide prevention. Variation in suicide risk may differ by country due to various reasons – different exposure or susceptibility to certain risk factors,
availability of resources for prevention, stigma for receiving mental health assistance, and other cultural factors. Further, risk factors differ by culture. Therefore, suicide prevention and treatment needs will differ by locality. Consideration of cultural and other population-specific factors may be important in the development of intervention programs and educational messages.

Sources of Support: None

28.

**ADOLESCENT BEHAVIOR PROBLEMS RELATED TO THE 9/11 DISASTER AND THE RISK OF BEHAVIOR PROBLEMS AND MENTAL HEALTH DISORDERS IN ADULTHOOD**

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**Purpose:** There is a dearth of literature monitoring outcomes in 9/11-exposed children into adolescence and then adulthood. Previous studies found an association between 9/11-exposure as a child and later behavior problems in adolescence. The objectives of this study were to determine the association between adolescent behavioral problems associated with 9/11-exposure on risk behaviors and mental health outcomes during adulthood.

**Methods:** Enrollees of the World Trade Center Health Registry who completed at least one adolescent and adult survey were included in the sample. Adolescent data was collected either from 2006-2007 or 2011-2012 surveys. Adult data was collected either from 2011-2012 or 2015-2016 surveys. Adolescent behavioral difficulties were assessed using the adolescent-reported Strengths and Difficulties Questionnaire (SDQ). Adult risk behaviors were binge drinking (defined as 5 or more drinks for men or 4 or more drinks for women in one occasion) and smoking status by combining adolescent and adult report (never, new, former, and consistent). Adult mental health outcomes included: post-traumatic stress disorder (PTSD), assessed using a 9/11-specific PTSD Checklist-Civilian Version (PCL-17) with a cut-off score of 44 or greater considered probable PTSD; depression, assessed using the PHQ-8, with a cut-off score of 10 or greater indicating probable depression; and the self-reported number of physician mental health diagnoses: PTSD, depression, and/or anxiety. Multivariable logistic regression was used to estimate associations with risk behaviors and mental health outcomes, adjusting for demographic variables that were significant in the bivariate analyses.

**Results:** Of the 297 enrollees, 16.8% (n=80) had abnormal/borderline SDQ scores as an adolescent. Binge drinking was not associated with adolescent SDQ score. Enrollees who had abnormal/borderline SDQ scores as an adolescent were 5.4 times more likely to be a consistent smoker (95% Confidence Interval (CI): 1.2-24.3) compared to those who had a normal SDQ score. Enrollees who had abnormal/borderline SDQ scores as an adolescent were 4 times more likely to have probable PTSD (95% CI: 1.4-11.2); almost 7 times more likely to have probable depression (95% CI: 3.0-16.2); and 5.3 times more likely to have 2 or more physician diagnosed mental health conditions as an adult (95% CI: 2.1-13.4) compared to enrollees who had normal SDQ scores as an adolescent.

**Conclusions:** These results suggest that 9/11-related behavior problems as an adolescent is associated with an increased risk of continued smoking from adolescentces into adulthood and mental health disorders many years later as an adult. Early recognition of the effects of exposure to a disaster during
childhood and appropriate intervention may play an important role in prevention of mental health conditions throughout the life span.

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29.

**USE OF EVIDENCE-BASED MEDICATION TREATMENT AMONG MEDICAID-ENROLLED YOUTH WITH OPIOID USE DISORDER, 2014-2015.**

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**Purpose:** Opioid use disorder (OUD) most commonly begins in adolescence and young adulthood, and medication treatment with buprenorphine, methadone, or naltrexone is recommended by major professional organizations including the American Academy of Pediatrics. Yet, no prior studies have examined the extent to which publicly insured adolescents and young adults (collectively, “youth”) receive recommended medications for OUD. We sought to determine the percentage of Medicaid-enrolled youth with OUD who receive recommended pharmacotherapy, and identify disparities according to age, sex, race/ethnicity, and psychiatric comorbidity.

**Methods:** Using the Truven MarketScan data, we analyzed all inpatient, emergency department, outpatient, and pharmacy claims of 2,490,114 Medicaid-enrolled youth from 11 states between January 2014 and December 2015. Inclusion criteria were (a) age 13-22 years, (b) ≥11 months of continuous enrollment, (c) a diagnosis of opioid use disorder (OUD; based on International Classification of Diseases, Ninth Revision, Clinical Modification [ICD-9-CM] codes 304.0x and 304.7x) in ≥1 inpatient or emergency department claim or in ≥2 outpatient claims, and (d) preceding 1-month window without a prior OUD diagnosis or receipt of OUD medication. We determined the proportion of youth dispensed buprenorphine, methadone, or naltrexone within 3 months of their first OUD diagnosis. We then identified differences in receipt of medication according to age, sex, race/ethnicity, and psychiatric comorbidity using multivariable logistic regression. The study was approved by the Boston University Institutional Review Board.

**Results:** Among 6,864 youth diagnosed with OUD, 59.4% (n=4,074) were female and 78.4% (n=5,380) were non-Hispanic white. Median age (interquartile range) was 20 (19-22) years at diagnosis. Overall, 21.6% (n=1,483) youth were dispensed any recommended medication within 3 months of diagnosis and of these, 84.0% (n=1,245) received buprenorphine, 5.5% (n=81) received methadone, and 10.5% (n=157) received naltrexone. Adolescents <18 years were more likely than young adults ≥18 to receive naltrexone, and young adults ≥18 were more likely to receive buprenorphine or methadone (p<0.001). Younger individuals were less likely to receive medications (age 13-15: adjusted odds ratio [AOR], 0.09; 95% confidence interval [CI], 0.04-0.21; age 16-17: AOR, 0.17; 95% CI, 0.12-0.24; age 18-20: AOR, 0.76;
95% CI, 0.67-0.87) compared to adults ≥21 years, as were males compared to females (AOR, 0.75; 95% CI, 0.67-0.86) and black youth compared to non-Hispanic white youth (AOR, 0.39; 95% CI, 0.28-0.55). Receipt of medication was less likely among youth with depression (AOR, 0.79; 95% CI, 0.66-0.96), comorbid alcohol use disorder (AOR, 0.70; 95% CI, 0.51-0.97), or another comorbid substance use disorder (AOR, 0.83; 95% CI, 0.70-0.98).

**Conclusions:** In this first multi-state study of Medicaid-enrolled youth with OUD, only 1 in 5 received evidence-based medication treatment. Pharmacotherapy may be particularly underutilized among adolescents. As clinicians and policymakers work to confront this treatment gap, efforts should be made to address the disparities we observed for males and black youth, and to maximize treatment for youth with depression and polysubstance use.

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