Substance Use Among Older PLWH

REFERENCES

- 1. Centers for Disease Control and Prevention, HIV Among People Aged 50 and Over. (2018). Available online at: https://www.cdc.gov/hiv/group/age/ olderamericans/index.html (accessed May 1, 2018).
- 2. Centers for Disease Control and Prevention. HIV Surveillance Report, 2016. (2017). Available online at: http://www.cdc.gov/hiv/library/reports/ hiv-surveillance.html (accessed January 27, 2018).
- 3. Ghidei L, Simone MJ, Salow MJ, Zimmerman KM, Paquin AM, Skarf LM, et al. Aging, antiretrovirals, and adherence: a meta analysis of adherence among older HIV-infected individuals. Drugs Aging. (2013) 30:809-19. doi: 10.1007/s40266-013-0107-7
- 4. Meyer JP, Althoff AL, Altice FL. Optimizing care for HIV-infected people who use drugs: evidence-based approaches to overcoming healthcare disparities. Clin Infect Dis. (2013) 57:1309-17. doi: 10.1093/cid/c
- 5. Edelman EJ, Tetrault JM, Fiellin DA. Substance use in older HIV-infected patients, Curr Opin HIV AIDS, (2014) 9:317-
- 24. doi: 10.1097/COH.0000000000000069
- 6. Millar BM, Starks TJ, Gurung S, Parsons JT. The impact of comorbidities, depression, and substance use problems on quality of life among older adults living with HIV. AIDS Behav. (2017) 21:1684-90. doi: 10.1007/s10461-016-1613-5
- 7. Brennan M, Karpiak SE, Shippy A, Cantor MH. Older Adults with HIV: An In-Depth Examination of an Emerging Population. New York, NY: Nova Science Publishers, Inc. (2009).
- 8. Applebaum A, Brennan M. Substance and alcohol use. In: Brennan M, Karpiak S, Shippy R, Cantor M, editors. Older Adults with HIV: An Indepth Examination of an Emerging Population. New York, NY: Nova Science
- 9. Bensley KM, McGinnis KA, Fiellin DA, Gordon AJ, Kraemer KL, Bryant KJ, et al. Racial/ethnic differences in the association between alcohol use and mortality among men living with HIV. Addict Sci Clin Pract. (2018) 13:2. doi: 10.1186/s13722-017-0103-z
- 10. Parsons JT, Starks TJ, Millar BM, Boonrai K, Marcotte D. Patterns of substance use among HIV-positive adults over 50: implications for treatment and medication adherence. Drug Alcohol Depend. (2014) 139:33-40. doi: 10.1016/j.drugalcdep.2014.02.704
- 11. Centers for Disease Control and Prevention. HIV Among People Who Inject Drugs. (2018). Available online at: https://www.cdc.gov/hiv/group/hiv-idu. html (accessed June 12, 2018).
- 12. Cleary M, Sayers J, Bramble M, Jackson D, Lopez V. Overview of substance use and mental health among the "baby boomers" generation. Issues Ment Health Nurs. (2017) 38:61-5. doi: 10.1080/01612840.2016.1243177
- 13. Centers for Disease Control and Prevention. New HIV Infections in the United States. (2016). Available online at: https://www.cdc.gov/nchhstp/ Frontiers in Public Health | www.frontiersin.org 7 April 2019 | Volume 7 | Article 94 Deren et al. Substance Use Among Older PLWH
- newsroom/docs/factsheets/new-hiv-infections-508.pdf (accessed June 20,
- 14. Institute of Medicine. The Health of Lesbian, Gay, Bisexual, and Transgender People: Building a Foundation for Better Understanding. Washington, DC: The National Academies Press (2011).
- 15. Bourne A, Weatherburn P. Substance use among men who have sex with men: patterns, motivations, impacts and intervention development need. Sex Transm Infect. (2017) 93:342-6. doi: 10.1136/sextrans-2016-052674
- 16. Kurtz SP, Stall RD, Buttram ME, Surratt HL, Chen M. A randomized trial of a behavioral intervention for high risk substance-using MSM. AIDS Behav. (2013) 17:2914-26. doi: 10.1007/s10461-013-0531-z
- 17. Ompad DC, Kingdon M, Kupprat S, Halkitis SN, Storholm ED, Halkitis PN. Smoking and HIV-related health issues among older HIV-positive gay, bisexual, and other men who have sex with men. Behav Med. (2014)
- 40:99-107. doi: 10.1080/08964289.2014.889067 18. US Department of Health and Human Services. The Health Consequences of Smoking: 50 Years of Progress. A Report of the Surgeon General. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease

Prevention and Health Promotion, Office on Smoking and Health (2014). Available online at: https://www.surgeongeneral.gov/library/reports/ 50-years-of-progress/full-report.pdf (accessed December 19, 2016). 19. Kooij KW, Wit FW, Booiman T, van der Valk M, Schim van der Loeff MF, Kootstra NA, et al. Cigarette smoking and inflammation, monocyte activation, and coagulation in HIV-infected individuals receiving antiretroviral therapy, compared with uninfected individuals. J Infect Dis. (2016) 214:1817-21. doi: 10.1093/infdis/iiw459 20. Mdodo R, Frazier EL, Dube SR, Mattson CL, Sutton MY, Brooks JT, et al. Cigarette smoking prevalence among adults with HIV compared with the general adult population in the United States: cross-sectional surveys. Ann Intern Med. (2015) 162:335-44. doi: 10.7326/M14-0954 21. Shirley DK, Kaner RJ, Glesby MJ. Effects of smoking on non-AIDSrelated morbidity in HIV-infected patients. Clin Infect Dis. (2013) 57:275-82. doi: 10.1093/cid/cit207 22. Helleberg M, Afzal S, Kronborg G, Larsen CS, Pedersen G, Pedersen C, et al. Mortality attributable to smoking among HIV-1-infected individuals: a nationwide, population-based cohort study. Clin Infect Dis. (2013) 56:727-34. doi: 10.1093/cid/cis933 23. Webb MS, Vanable PA, Carey MP, Blair DC. Medication adherence in HIVinfected smokers: the mediating role of depressive symptoms. AIDS Educ Prev. (2009) 21 (Suppl. 3):94-105. doi: 10.1521/aeap.2009.21.3 supp.94 24. Miguez-Burbano MJ, Burbano X, Ashkin D, Pitchenik A, Allan R, Pineda L. et al. Impact of tobacco use on the development of opportunistic respiratory infections in HIV seropositive patients on antiretroviral therapy. Addict Biol. (2003) 8:39-43. doi: 10.1080/1355621031000069864 25. Winhusen T, Feaster DJ, Duan R, Brown JL, Daar ES, Mandler R, et al. Baseline cigarette smoking status as a predictor of virologic suppression and CD4 cell count during one-year follow-up in substance users with uncontrolled HIV infection. AIDS Behav. (2018) 22:2026-32. doi: 10.1007/s10461-017-1928-x 26. Jones S, Restrepo D, Kasowitz A, Korenstein D, Wallenstein S, Schneider A, et al. Risk factors for decreased bone density and effects of HIV on bone in the elderly. Osteoporos Int. (2008) 19:913-8. doi: 10.1007/s00198-007-0524-8 27. Stevenson JS. Alcohol use, misuse, abuse, and dependence in later adulthood. Annu Rev Nurs Res. (2005) 23:245-80. doi: 10.1891/0739-6686.23.1.245 28. US Department of Health and Human Services, Office of the Surgeon General, Facing Addiction in America: The Surgeon General's Report on Alcohol, Drugs, and Health. Washington, DC: US Dept of Health and Human Services (2016). Available online at: https://addiction.surgeongeneral.gov/ surgeon-generals-report.pdf (accessed December 20, 2016). 29. Centers for Disease Control and Prevention. Alcohol-Related Disease Impact (ARDI) Application. (2018). Available online at: https://nccd.cdc.gov/DPH_ ARDI/default/default.aspx (accessed June 4, 2018). 30. Rehm J, Probst C, Shield KD, Shuper PA. Does alcohol use have a causal effect on HIV incidence and disease progression? A review of the literature and a modeling strategy for quantifying the effect. Population Health Metrics. (2017) 15:4. doi: 10.1186/s12963-017-0121-9 31. Armstrong-Moore R, Haighton C, Davinson N, Ling J. Interventions to reduce the negative effects of alcohol consumption in older adults: a systematic review. BMC Public Health. (2018) 18:302. doi: 10.1186/s12889-018-5199-x 32. Crane HM. McCaul ME. Chander G. Hutton H. Nance RM. Delanev JAC. et al. Prevalence and factors associated with hazardous alcohol use among persons living with HIV across the US in the current era of antiretroviral treatment. AIDS Behav. (2017) 21:1914-25. doi: 10.1007/s10461-017-1740-7 33. Edelman EJ, Williams EC, Marshall BDL. Addressing unhealthy alcohol use among people living with HIV: recent advances and research directions. Curr Opin Infect Dis. (2018) 31:1-7. doi: 10.1097/QCO.0000000000000422 34. Molina PE, Simon L, Amedee AM, Welsh DA, Ferguson TF. Impact of alcohol on HIV disease pathogenesis, comorbities and aging: integrating preclinical and clinical findings. Alcohol Alcohol. (2018). doi: 10.1093/alcalc/agy016 35. Schouten J, Wit FW, Stolte IG, Kootstra NA, van der Valk M, Geerlings SE, et al. Cross-sectional comparison of the prevalence of age-associated comorbidities and their risk factors between HIV-infected and uninfected individuals: the AGEhIV cohort study. Clin Infect Dis. (2014) 59:1787-

97. doi: 10.1093/cid/ciu701

36. Vagenas P, Azar MM, Copenhaver MM, Springer SA, Molina PE, Altice FL. The impact of alcohol use and related disorders on the HIV

```
continuum of care: a systematic review. Curr HIV/AIDS Rep. (2015) 12:421-
36. doi: 10.1007/s11904-015-0285-5
37. Ogedengbe OO, Naidu ECS, Azu OO. Antiretroviral therapy and
alcohol interactions: X-raying testicular and seminal parameters under
the HAART era. Eur J Drug Metab Pharmacokinet. (2018) 43:121-
35. doi: 10.1007/s13318-017-0438-6
38. Brown TT, Guaraldi G. Multimorbidity and burden of disease. Interdiscip
Top Gerontol Geriatr. (2017) 42:59-73. doi: 10.1159/000448544
39. Maciel RA, Kluck HM, Durand M, Sprinz E. Comorbidity is more common
and occurs earlier in persons living with HIV than in HIV-uninfected
matched controls, aged 50 years and older: a cross-sectional study. Int J Infect
Dis. (2018) 70:30-5. doi: 10.1016/j.ijid.2018.02.009
40. Havlik RJ. Health status, Comorbidities, and Health-related Quality-of-Life.
Older Adults with HIV: An In-depth Examination of an Emerging Population.
New York, NY: Nova Science Publishers, Inc (2009).
41. Kaplan-Lewis E, Aberg JA, Lee M. Aging with HIV in the ART era. Semin
Diagn Pathol. (2017) 34:384–97. doi: 10.1053/j.semdp.2017.04.002
42. Vance DE, Mugavero M, Willig J, Raper JL, Saag MS. Aging with
HIV: a cross-sectional study of comorbidity prevalence and clinical
characteristics across decades of life. J Assoc Nurses AIDS Care. (2011)
22:17-25. doi: 10.1016/j.jana.2010.04.002
43. Marin B, Thiebaut R, Bucher HC, Rondeau V, Costagliola D,
Dorrucci M. et al. Non-AIDS-defining deaths and immunodeficiency
in the era of combination antiretroviral therapy. AIDS. (2009)
23:1743-53. doi: 10.1097/QAD.0b013e32832e9b78
44. Pathai S, Bajillan H, Landay AL, High KP. Is HIV a model of accelerated
or accentuated aging? J Gerontol A Biol Sci Med Sci. (2014) 69:833-
42. doi: 10.1093/gerona/glt168
45. Wing EJ. HIV and aging. Int J Infect Dis. (2016) 53:61-
8. doi: 10.1016/j.ijid.2016.10.004
46. Martin-Iguacel R, Negredo E, Peck R, Friis-Moller N. Hypertension is a
key feature of the metabolic syndrome in subjects aging with HIV. Curr
Hypertens Rep. (2016) 18:46. doi: 10.1007/s11906-016-0656-3
47. Karpiak SE, Havlik R. Are HIV-infected older adults aging differently?
Interdiscip Top Gerontol Geriatr. (2017) 42:11-27. doi: 10.1159/000448539
48. Oursler KK, Goulet JL, Crystal S, Justice AC, Crothers K, Butt AA, et al.
Association of age and comorbidity with physical function in HIV-infected
and uninfected patients; results from the veterans aging cohort study. AIDS
Patient Care STDS. (2011) 25:13-20. doi: 10.1089/apc.2010.0242
49. Siefried KJ, Mao L, Cysique LA, Rule J, Giles ML, Smith DE, et al.
Concomitant medication polypharmacy, interactions and imperfect
adherence are common in Australian adults on suppressive antiretroviral
therapy. AIDS. (2018) 32:35-48. doi: 10.1097/QAD.000000000001685
50. Kim TW, Walley AY, Ventura AS, Patts GJ, Heeren TC, Lerner GB,
et al. Polypharmacy and risk of falls and fractures for patients with
Frontiers in Public Health | www.frontiersin.org 8 April 2019 | Volume 7 | Article 94
Deren et al. Substance Use Among Older PLWH
HIV infection and substance dependence. AIDS Care. (2018) 30:150-
9. doi: 10.1080/09540121.2017.1384532
51. Kumar S, Rao PS, Earla R, Kumar A. Drug-drug interactions between antiretroviral
therapies and drugs of abuse in HIV systems. Expert Opin Drug
Metab Toxicol. (2015) 11:343-55. doi: 10.1517/17425255.2015.996546
52. Clements KM, Hydery T, Tesell MA, Greenwood BC, Angelini MC.
A systematic review of community-based interventions to improve
oral chronic disease medication regimen adherence among individuals
with substance use disorder. Drug Alcohol Depend. (2018) 188:141-
52. doi: 10.1016/j.drugalcdep.2018.03.039
53. Zhang Y, Wilson TE, Adedimeji A, Merenstein D, Milam J, Cohen J, et al.
The impact of substance use on adherence to antiretroviral therapy among
HIV-infected women in the United States. AIDS Behav. (2018) 22:896-
908. doi: 10.1007/s10461-017-1808-4
54. Cigolle CT, Langa KM, Kabeto MU, Tian Z, Blaum CS. Geriatric conditions
and disability: the health and retirement study. Ann Intern Med. (2007)
147:156-64. doi: 10.7326/0003-4819-147-3-200708070-00004
55. Buurman BM, Hoogerduijn JG, de Haan RJ, Abu-Hanna A, Lagaay AM,
Verhaar HJ, et al. Geriatric conditions in acutely hospitalized older patients:
prevalence and one-year survival and functional decline. PLoS ONE. (2011)
6:e26951. doi: 10.1371/journal.pone.0026951
56. Boling PA, Leff B. Comprehensive longitudinal health care in the home for
high-cost beneficiaries: a critical strategy for population health management.
```

J AmGeriatr Soc. (2014) 62:1974–6. doi: 10.1111/jgs.13049

```
57. Counsell SR, Callahan CM, Clark DO, Tu W, Buttar AB, Stump TE, et al.
Geriatric caremanagement for low-income seniors: a randomized controlled
trial. JAMA. (2007) 298:2623-33. doi: 10.1001/jama.298.22.2623
58. Greene M, Covinsky KE, Valcour V, Miao Y, Madamba J, Lampiris H, et al.
Geriatric syndromes in older HIV-infected adults. J Acquir Immune Defic
Syndr. (2015) 69:161-7. doi: 10.1097/QAI.00000000000556
59. Singh HK, Del Carmen T, Freeman R, Glesby MJ, Siegler EL. From one
syndrome to many: incorporating geriatric consultation into HIV care. Clin
Infect Dis. (2017) 65:501-6. doi: 10.1093/cid/cix311
60. Han BH, Moore AA. Prevention and screening of unhealthy
```

substance use by older adults. Clin Geriatr Med. (2018)

34:117-29. doi: 10.1016/j.cger.2017.08.005

61. Reece AS. Evidence of accelerated ageing in clinical drug addiction from immune, hepatic and metabolic biomarkers. Immun Ageing. (2007) 4:6. doi: 10.1186/1742-4933-4-6

62. Chau DL, Walker V, Pai L, Cho LM. Opiates and elderly: use and side effects. Clin Interv Aging. (2008) 3:273-8. doi: 10.2147/CIA.S1847

63. Bachi K, Sierra S, Volkow ND, Goldstein RZ, Alia-Klein N. Is biological aging accelerated in drug addiction? Curr Opin Behav Sci. (2017) 13:34-9. doi: 10.1016/j.cobeha.2016.09.007

64. Negredo E, Back D, Blanco JR, Blanco J, Erlandson KM, Garolera M, et al. Aging in HIV-infected subjects: a new scenario and a new view. Biomed Res Int. (2017) 2017:5897298. doi: 10.1155/2017/5897298

65. George O, Mandyam CD, Wee S, Koob GF. Extended access to cocaine self-administration produces long-lasting prefrontal cortex-dependent working memory impairments. Neuropsychopharmacology. (2008) 33:2474-82. doi: 10.1038/sj.npp.1301626

66. Arguello AA, Harburg GC, Schonborn JR, Mandyam CD, Yamaguchi M, Eisch AJ. Time course of morphine's effects on adult hippocampal subgranular zone reveals preferential inhibition of cells in S phase of the cell cycle and a subpopulation of immature neurons. Neuroscience. (2008) 157:70-9. doi: 10.1016/j.neuroscience.2008.08.064

67. Kelley BJ, Yeager KR, Pepper TH, Beversdorf DQ. Cognitive impairment in acute cocaine withdrawal. Cogn Behav Neurol. (2005)

18:108-12. doi: 10.1097/01.wnn.0000160823.61201.20 68. Davis C, Cohen A, Davids M, Rabindranath A. Attentiondeficit/

hyperactivity disorder in relation to addictive behaviors: a moderated-mediation analysis of personality-risk factors and sex. Front Psychiatry. (2015) 6:47. doi: 10.3389/fpsyt.2015.00047

69. Mintzer MZ, Copersino ML, Stitzer ML. Opioid abuse and cognitive performance. Drug Alcohol Depend. (2005) 78:225-

30. doi: 10.1016/j.drugalcdep.2004.10.008

70. Gunn RL, Gerst KR, Lake AJ, Finn PR. The effects of working memory load and attention refocusing on delay discounting rates in alcohol use disorder with comorbid antisocial personality disorder. Alcohol. (2018) 66:9-14. doi: 10.1016/j.alcohol.2017.07.009

71. Lundqvist T. Cognitive consequences of cannabis use: comparison with abuse of stimulants and heroin with regard to attention, memory and executive functions. Pharmacol Biochem Behav. (2005) 81:319-30. doi: 10.1016/j.pbb.2005.02.017

72. McClernon FJ, Froeliger B, Rose JE, Kozink RV, Addicott MA, Sweitzer MM, et al. The effects of nicotine and non-nicotine smoking factors on working memory and associated brain function. Addict Biol. (2016) 21:954-61. doi: 10.1111/adb.12253

73. Solowij N, Stephens RS, Roffman RA, Babor T, Kadden R, Miller M, et al. Cognitive functioning of long-term heavy cannabis users seeking treatment. JAMA. (2002) 287:1123-31. doi: 10.1001/jama.287.9.1123

74. Thomasius R, Petersen K, Buchert R, Andresen B, Zapletalova P, Wartberg L, et al. Mood, cognition and serotonin transporter availability in current and former ecstasy (MDMA) users. Psychopharmacology. (2003) 167:85-96. doi: 10.1007/s00213-002-1383-9

75. Verdejo-García A, Pérez-García M. Profile of executive deficits in cocaine and heroin polysubstance users: common and differential effects on separate executive components. Psychopharmacology. (2007) 190:517-30. doi: 10.1007/s00213-006-0632-8

76. Mahajan AP, Sayles JN, Patel VA, Remien RH, Sawires SR, Ortiz DJ, et al. Stigma in the HIV/AIDS epidemic: a review of the literature and recommendations for the way forward. AIDS. (2008) 22 (Suppl. 2):S67-79. doi: 10.1097/01.aids.0000327438.13291.62

77. Lekas HM, Siegel K, Schrimshaw EW. Continuities and discontinuities in the

```
experiences of felt and enacted stigma among women with HIV/AIDS. Qual
Health Res. (2006) 16:1165-90. doi: 10.1177/1049732306292284
78. Emlet CA. "You're awfully old to have this disease": experiences of stigma
and ageism in adults 50 years and older living with HIV/AIDS. Gerontologist.
(2006) 46:781-90. doi: 10.1093/geront/46.6.781
79. Stein GL, Beckerman NL, Sherman PA. Lesbian and gay elders and longterm
care: identifying the unique psychosocial perspectives and challenges. J
Gerontol SocWork. (2010) 53:421-35. doi: 10.1080/01634372.2010.496478
80. Johnson Shen M, Freeman R, Karpiak S, Brennan-Ing M, Seidel L, Siegler
EL. The intersectionality of stigmas among key populations of older
adults affected by HIV: a thematic analysis. Clin Gerontol. (2018) 42:137-
49. doi: 10.1080/07317115.2018.1456500
81. Sangaramoorthy T, Jamison A, Dyer T. Intersectional stigma among midlife
and older Black women living with HIV. Cult Health Sexuality. (2017)
19:1329-43. doi: 10.1080/13691058.2017.1312530
82. Rueda S, Mitra S, Chen S, Gogolishvili D, Globerman J, Chambers L,
et al. Examining the associations between HIV-related stigma and health
outcomes in people living with HIV/AIDS: a series of meta-analyses. BMJ
Open. (2016) 6:e011453. doi: 10.1136/bmjopen-2016-011453
83. Emlet CA. Stigma in an aging context. Interdiscip Top Gerontol Geriatr.
(2017) 42:144-58. doi: 10.1159/000448560
84. Porter KE, Brennan-Ing M, Burr JA, Dugan E, Karpiak SE. HIV stigma
and older men's psychological well-being: do coping resources differ for
gay/bisexual and straight men? J Gerontol B Psychol Sci Soc Sci. (2019).
74:685-93. doi: 10.1093/geronb/gbx101
85. Afifi TO, Henriksen CA, Asmundson GJ, Sareen J. Childhood
maltreatment and substance use disorders among men and women
in a nationally representative sample. Can J Psychiatry. (2012)
57:677-86. doi: 10.1177/070674371205701105
86. Wilson HW, Widom CS. An examination of risky sexual behavior and HIV
in victims of child abuse and neglect: a 30-year follow-up. Health Psychol.
(2008) 27:149-58. doi: 10.1037/0278-6133.27.2.149
87. Lee JG, Henriksen L, Rose SW, Moreland-Russell S, Ribisl KM. A
systematic review of neighborhood disparities in point-of-sale tobacco
marketing. Am J Public Health. (2015) 105:e8-18. doi: 10.2105/AJPH.2015.3
88. Mereish EH, Goldbach JT, Burgess C, DiBello AM. Sexual
orientation, minority stress, social norms, and substance use
among racially diverse adolescents. Drug Alcohol Depend. (2017)
178:49-56. doi: 10.1016/j.drugalcdep.2017.04.013
89. Lopez-Patton M, Kumar M, Jones D, Fonseca M, Kumar AM, Nemeroff
CB. Childhood trauma and METH abuse among men who have sex
Frontiers in Public Health | www.frontiersin.org 9 April 2019 | Volume 7 | Article 94
Deren et al. Substance Use Among Older PLWH
with men: implications for intervention. J Psychiatr Res. (2016) 72:1-
5. doi: 10.1016/j.jpsychires.2015.09.009
90. Lindau ST, Schumm LP, Laumann EO, Levinson W, O'Muircheartaigh
CA, Waite LJ. A study of sexuality and health among older adults in the
United States.N Engl JMed. (2007) 357:762-74. doi: 10.1056/NEJMoa067423
91. Golub SA, Grov C, Tomassilli J. Sexual behavior among HIV+ older adults.
In: Brennan M, Karpiak SE, Shippy RA, Cantor MH, editors. Older Adults
with HIV: An In-depth Examination of an Emerging Population. New York,
NY: Nova Science Publishers, Inc (2009). p. 43-50.
92. Taylor TN, Munoz-Plaza CE, Goparaju L, Martinez O, Holman S, Minkoff
HL, et al. "The pleasure is better as I've gotten older": sexual health, sexuality,
and sexual risk behaviors among older women living with HIV. Arch Sex
Behav. (2017) 46:1137-50. doi: 10.1007/s10508-016-0751-1
93. Kupprat SA, Krause KD, Ompad DC, Halkitis PN. Substance use and
cognitive function as drivers of condomless anal sex among HIV-positive
gay, bisexual, and other men who have sex with men aged 50 and older; the
gold studies. LGBT Health. (2017) 4:434-41. doi: 10.1089/lgbt.2016.0163
94. Hutton HE, McCaul ME, Chander G, Jenckes MW, Nollen C, Sharp
VL, et al. Alcohol use, anal sex, and other risky sexual behaviors
among HIV-infected women and men. AIDS Behav. (2013) 17:1694-
704. doi: 10.1007/s10461-012-0191-4
95. Starks TJ, Millar BM, Parsons JT. Predictors of condom use with main and
casual partners among HIV-positive men over 50. Health Psychol. (2015)
34:1116-22. doi: 10.1037/hea0000236
96. Karpiak SE, Lunievicz JL. Age is not a condom: HIV and
sexual health for older adults. Curr Sex Health Rep. (2017)
```

- 9:109-15. doi: 10.1007/s11930-017-0119-0
- 97. Golub SA, Tomassilli JC, Pantalone DW, Brennan M, Karpiak SE, Parsons
- JT. Prevalence and correlates of sexual behavior and risk management among HIV-positive adults over 50. Sex Transm Dis. (2010) 37:615—
- 20. doi: 10.1097/OLQ.0b013e3181e15f20
- 98. Heath J, Lanoye A, Maisto SA. The role of alcohol and substance use in risky sexual behavior among older men who have sex with men: a review and critique of the current literature. AIDS Behav. (2012) 16:578–89. doi: 10.1007/s10461-011-9921-2
- 99. Brennan-Ing M, Porter KE, Seidel L, Karpiak SE. Substance use and sexual risk differences among older bisexual and gay men with HIV. Behav Med.
- (2014) 40:108–15. doi: 10.1080/08964289.2014.889069
- 100. De P, Farley A, Lindson N, Aveyard P. Systematic review and meta-analysis: influence of smoking cessation on incidence of pneumonia in HIV. BMC Med. (2013) 11:15. doi: 10.1186/1741-7015-11-15
- 101. Petoumenos K, Worm S, Reiss P, de Wit S, d'Arminio Monforte A, Sabin C, et al. Rates of cardiovascular disease following smoking cessation in patients with HIV infection: results from the D:A:D study(*). HIV Med. (2011) 12:412–21. doi: 10.1111/j.1468-1293.2010.00901.x
- 102. Calvo-Sánchez M, Martinez E. How to address smoking cessation in HIV patients. HIV Med. (2015) 16:201–10. doi: 10.1111/hiv.12193
- 103. Ledgerwood DM, Yskes R. Smoking cessation for people living with HIV/AIDS: a literature review and synthesis. Nicotine Tob Res. (2016) 18:2177–84. doi: 10.1093/ntr/ntw126
- 104. US Preventive Services Task Force. Final Update Summary: Alcohol Misuse: Screening and Behavioral Counseling Interventions in Primary Care.
- (2016). Available online at: https://www.uspreventiveservicestaskforce.org/ Page/Document/UpdateSummaryFinal/alcohol-misuse-screening-andbehavioral-counseling-interventions-in-primary-care (accessed December 15, 2016).
- 105. National Institute on Alcohol Abuse and Alcoholism. Drinking Levels Defined. (2018). Available online at: https://www.niaaa.nih.gov/alcoholhealth/overview-alcohol-consumption/moderate-binge-drinking (accessed July 10, 2018).
- 106. Madras BK, Compton WM, Avula D, Stegbauer T, Stein JB, Clark HW. Screening, brief interventions, referral to treatment (SBIRT) for illicit drug and alcohol use at multiple healthcare sites: comparison at intake and 6 months later. Drug Alcohol Depend. (2009) 99:280–95. doi: 10.1016/j.drugalcdep.2008.08.003
- 107. Institute of Medicine. The Future of Nursing: Leading Change, Advancing Health. Washington, DC: The National Academies Press (2011).
- 108. Deren S, Naegle M, Hagan H, Ompad DC. Continuing links between substance use and HIV highlight the importance of nursing roles. J Assoc Nurses AIDS Care. (2017) 28:622–32. doi: 10.1016/j.jana.2017.03.005 109. Rodda J, Walker Z, Carter J. Depression in older adults. BMJ. (2011) 343:d5219. doi: 10.1136/bmj.d5219
- 110. Cahoon CG. Depression in older adults. Am J Nurs. (2012) 112:22–30. doi: 10.1097/01.NAJ.0000422251.65212.4b
- 111. American Psychological Association. Patient Health Questionnaire (PHQ-9 & PHQ-2). (2018). Available online at: http://www.apa.org/pi/about/publications/caregivers/practice-settings/assessment/tools/patient-health. aspx (accessed September 10, 2018).
- 112. Arroll B, Goodyear-Smith F, Crengle S, Gunn J, Kerse N, Fishman T, et al. Validation of PHQ-2 and PHQ-9 to screen for major depression in the primary care population. Ann Fam Med. (2010) 8:348–53. doi: 10.1370/afm.1139
- 113. Doerflinger D. Mental Status Assessment in Older Adults: Montreal Cognitive Assessment MoCA Version 7.1 (Original Version). (2012). Available online at: https://consultgeri.org/try-this/general-assessment/issue-3.2.pdf (accessed August 10, 2018).
- 114. Ports KA, Barnack-Tavlaris JL, Syme ML, Perera RA, Lafata JE. Sexual health discussions with older adult patients during periodic health exams. J Sex Med. (2014) 11:901–8. doi: 10.1111/jsm.12448
- 115. Centers for Disease Control and Prevention. Quitting Smoking. (2017). Available online at: https://www.cdc.gov/tobacco/data_statistics/fact_sheets/cessation/quitting/index.htm (accessed August 29, 2018).
- 116. National Institute on Alcohol Abuse and Alcoholism. Treatment for Alcohol Problems: Finding and Getting Help. (2014). Available online at: https://pubs.niaaa.nih.gov/publications/treatment/treatment.htm (accessed June 20, 2018).

- 117. National Institute on Drug Abuse. Effective Treatments for Opioid Addiction. (2016). Available online at: https://www.drugabuse.gov/publications/effective-treatments-opioid-addiction/effective-treatments-opioidaddiction (accessed August 10, 2018).
- 118. Bartlett R, Brown L, Shattell M, Wright T, Lewallen L. Harm reduction: compassionate care of persons with addictions. Medsurg Nurs. (2013) 22:349–53.
- 119. Lambda Legal. Long-Term Care and People Living with HIV. (2010). Available online at: https://www.lambdalegal.org/sites/default/files/publications/downloads/fs_long-term-care-and-people-living-withhiv_1.pdf (accessed August 10, 2018).
- 120. New York State Department of Health. New York State Hospital Patients' Bill of Rights. (2017). Available online at: https://www.health.ny.gov/publications/1500/ (accessed June 17, 2018).
- 121. Bond A. Nursing Homes Routinely Refuse People on Addiction Treatment—Which Some Experts Say is Illegal. (2018). Available online at: https://www.statnews.com/2018/04/17/nursing-homes-addiction-treatment/ (accessed May 4, 2018).
- 122. Goldberg RJ, Grabowski R. Methadone maintenance: its future in skilled nursing facilities. J Am Med Dir Assoc. (2003) 4:98–100. doi: 10.1097/01.JAM.0000052519.23590.42

Conflict of Interest Statement: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Copyright © 2019 Deren, Cortes, Dickson, Guilamo-Ramos, Han, Karpiak, Naegle, Ompad and Wu. This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY). The use, distribution or reproduction in other forums is permitted, provided the original author(s) and the copyright owner(s) are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms.

Frontiers in Public Health | www.frontiersin.org 10 April 2019 | Volume 7 | Article 94

Ompad et al. Page 5

Acknowledgements

The GOLD II Study was funded by New York University's Steinhardt School of Culture, Education, and Human Development through a Challenge Community Collaborative Award. TG was funded by Hellenic Centre for Disease Control and Prevention. DCO was supported by the Center for Drug Use and HIV Research (CDUHR - P30 DA011041).

This study was funded through an NYU Steinhardt School of Culture, Education, and Human Development Challenge Grant (PI Kapadia). Ompad was supported by the Center for Drug Use and HIV Research (CDUHR - P30 DA011041).

Works cited

- Arnsten JH, Demas PA, Grant RW, Gourevitch MN, Farzadegan H, Howard AA, Schoenbaum EE. Impact of active drug use on antiretroviral therapy adherence and viral suppression in HIV-infected drug users. J Gen Intern Med. 2002; 17(5):377–381. [PubMed: 12047736]
- Babor, TF., Higgins-Biddle, JC., Saunders, JB., Monteiro, MG. AUDIT: The Alcohol Use Disorders Identification Test, Guidelines for Use in Primary Care. Series Eds. World Health Organization & Department of Mental Health and Substance Dependence; 2001. Retrieved from http://apps.who.int/iris/bitstream/10665/67205/1/WHO MSD MSB 01.6a.pdf
- Baum MK, Rafie C, Lai S, Sales S, Page B, Campa A. Crack-cocaine use accelerates HIV disease progression in a cohort of HIV-positive drug users. J Acquir Immune Defic Syndr. 2009; 50(1):93–99. doi: 10.1097/QAI.0b013e3181900129. [PubMed: 19295339]
- Benotsch EG, Martin AM, Koester S, Cejka A, Luckman D. Nonmedical use of prescription drugs and HIV risk behavior in gay and bisexual men. Sex Transm Dis. 2011; 38(2):105–110. doi: 10.1097/OLQ.0b013e3181f0bc4b. [PubMed: 20838365]
- Brewer TH, Zhao W, Metsch LR, Coltes A, Zenilman J. High-risk behaviors in women who use crack: knowledge of HIV serostatus and risk behavior. Ann Epidemiol. 2007; 17(7):533–539. doi: 10.1016/j.annepidem.2007.01.029. [PubMed: 17407822]
- Carey JW, Mejia R, Bingham T, Ciesielski C, Gelaude D, Herbst JH, Stall R. Drug use, high-risk sex behaviors, and increased risk for recent HIV infection among men who have sex with men in Chicago and Los Angeles. AIDS Behav. 2009; 13(6):1084–1096. doi: 10.1007/s10461-008-9403-3. [PubMed: 18498049]
- Center for Behavioral Health Statistics and Quality. 2014 National Survey on Drug Use and Health: Detailed Tables. 2015. Retrieved from http://www.samhsa.gov/data/sites/default/files/NSDUH-DetTabs2014/NSDUH-DetTabs2014.pdf
- Centers for Disease Control and Prevention. HIV Surveillance Report. 2015; 26 2014. Retrieved from http://www.cdc.gov/hiv/library/reports/surveillance/index.html.
- Doshi RK, Vogenthaler NS, Lewis S, Rodriguez A, Metsch L, del Rio C. Correlates of antiretroviral utilization among hospitalized HIV-infected crack cocaine users. AIDS Res Hum Retroviruses. 2012; 28(9):1007–1014. doi: 10.1089/aid.2011.0329. [PubMed: 22214200]
- Edelman EJ, Tetrault JM, Fiellin DA. Substance use in older HIV-infected patients. Curr Opin HIV AIDS. 2014; 9(4):317–324. doi: 10.1097/COH.000000000000069. [PubMed: 24824888]
- Friedmann PD, Zhang Z, Hendrickson J, Stein MD, Gerstein DR. Effect of primary medical care on addiction and medical severity in substance abuse treatment programs. J Gen Intern Med. 2003; 18(1):1–8. [PubMed: 12534757]
- Green TC, Kershaw T, Lin H, Heimer R, Goulet JL, Kraemer KL, Justice AC. Patterns of drug use and abuse among aging adults with and without HIV: a latent class analysis of a US Veteran cohort. Drug Alcohol Depend. 2010; 110(3):208–220. doi: 10.1016/j.drugalcdep.2010.02.020. [PubMed: 20395074]
- Han B, Gfroerer JC, Colliver JD, Penne MA. Substance use disorder among older adults in the United States in 2020. Addiction. 2009; 104(1):88–96. [PubMed: 19133892]
- Institute of Medicine. Retooling for an Aging America: Building the Health Care Workforce. The National Academies Press; Washington (DC): 2008.

Ompad et al. Page 6

Justice AC, McGinnis KA, Atkinson JH, Heaton RK, Young C, Sadek J, Veterans Aging Cohort 5-Site Study Project, T. Psychiatric and neurocognitive disorders among HIV-positive and negative veterans in care: Veterans Aging Cohort Five-Site Study. AIDS. 2004; 18(Suppl 1):S49–59.

- Kim TW, Samet JH, Cheng DM, Winter MR, Safran DG, Saitz R. Primary care quality and addiction severity: a prospective cohort study. Health Serv Res. 2007; 42(2):755–772. doi: 10.1111/j. 1475-6773.2006.00630.x. [PubMed: 17362216]
- Lucas GM, Griswold M, Gebo KA, Keruly J, Chaisson RE, Moore RD. Illicit drug use and HIV-1 disease progression: a longitudinal study in the era of highly active antiretroviral therapy. Am J Epidemiol. 2006; 163(5):412–420. doi: 10.1093/aje/kwj059. [PubMed: 16394200]
- Madras BK, Compton WM, Avula D, Stegbauer T, Stein JB, Clark HW. Screening, brief interventions, referral to treatment (SBIRT) for illicit drug and alcohol use at multiple healthcare sites: comparison at intake and 6 months later. Drug Alcohol Depend. 2009; 99(1–3):280–295. doi: 10.1016/j.drugalcdep.2008.08.003. [PubMed: 18929451]
- Mimiaga MJ, Reisner SL, Grasso C, Crane HM, Safren SA, Kitahata MM, Mayer KH. Substance use among HIV-infected patients engaged in primary care in the United States: findings from the Centers for AIDS Research Network of Integrated Clinical Systems cohort. Am J Public Health. 2013; 103(8):1457–1467. doi: 10.2105/ajph.2012.301162. [PubMed: 23763417]
- Myers JD. Growing old with HIV: the AIDS epidemic and an aging population. Jaapa. 2009; 22(1):20–24.
- Paul SM, Martin RM, Lu SE, Lin Y. Changing trends in human immunodeficiency virus and acquired immunodeficiency syndrome in the population aged 50 and older. J Am Geriatr Soc. 2007; 55(9): 1393–1397. doi: 10.1111/j.1532-5415.2007.01295.x. [PubMed: 17767680]
- Prentiss D, Power R, Balmas G, Tzuang G, Israelski DM. Patterns of marijuana use among patients with HIV/AIDS followed in a public health care setting. J Acquir Immune Defic Syndr. 2004; 35(1):38–45. [PubMed: 14707790]
- Purvis, L. Prevalence of illicit drug use in older adults: The impact of the baby boom generation. Washington, DC: 2010.
- Rabkin JG, McElhiney MC, Ferrando SJ. Mood and substance use disorders in older adults with HIV/AIDS: methodological issues and preliminary evidence. AIDS. 2004; 18:S43–S48. [PubMed: 15075497]
- Sheehan, D., Janavs, J., Baker, K., Harnett-Sheehan, E., Knapp, E., Sheehan, M. M.I.N.I. MINI International Neuropsychiatric Interview, English version 5.0.0, DSM-IV. 2006. Retrieved 2 Feb 2016, from http://narr.bmap.ucla.edu/docs/MINI v5 002006.pdf
- Shorter D, Kosten TR. Novel pharmacotherapeutic treatments for cocaine addiction. BMC Med. 2011; 9:119. doi: 10.1186/1741-7015-9-119. [PubMed: 22047090]
- Skalski LM, Sikkema KJ, Heckman TG, Meade CS. Coping styles and illicit drug use in older adults with HIV/AIDS. Psychol Addict Behav. 2013; 27(4):1050–1058. doi: 10.1037/a0031044. [PubMed: 23438250]
- Skeer MR, Mimiaga MJ, Mayer KH, O'Cleirigh C, Covahey C, Safren SA. Patterns of substance use among a large urban cohort of HIV-infected men who have sex with men in primary care. AIDS Behav. 2012; 16(3):676–689. doi: 10.1007/s10461-011-9880-7. [PubMed: 21234666]
- Weisner C, Mertens J, Parthasarathy S, Moore C, Lu Y. Integrating primary medical care with addiction treatment: a randomized controlled trial. JAMA. 2001; 286(14):1715–1723. [PubMed: 11594896]
- Wood E, Montaner JS, Yip B, Tyndall MW, Schechter MT, O'Shaughnessy MV, Hogg RS. Adherence and plasma HIV RNA responses to highly active antiretroviral therapy among HIV-1 infected injection drug users. Cmaj. 2003; 169(7):656–661. [PubMed: 14517122]
- Wu LT, Blazer DG. Illicit and Nonmedical Drug Use Among Older Adults: A Review. J Aging Health. 2011; 23(3):481–504. [PubMed: 21084724]