Transdiagnostic psychological intervention (CETA) improves three-month HIV retention by over 14% in Mozambique

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Wilson H. Hammett

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Committee:
Brad Wagenaar
Pamela Collins

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Abstract

Transdiagnostic psychological intervention (CETA) improves three-month HIV retention by over 14% in Mozambique

Wilson H. Hammett

Chair of the Supervisory Committee:

Dr. Brad Wagenaar, MPH, PhD

University of Washington, Department of Global Health

Common mental disorders (CMDs) are associated with poor HIV outcomes in low- and middle-income countries, yet few have scaled-up CMD treatments in HIV platforms. The present study analyzed a demonstration project of a psychological therapy delivered in routine HIV care and its effects on HIV outcomes in Mozambique. In May 2019, the Common Elements Treatment Approach (CETA) was integrated into routine HIV care in five facilities in Sofala, Mozambique. All newly-diagnosed adult HIV+ patients were screened for CMDs and those with clinically-significant symptoms were offered CETA. CETA HIV treatment initiation and retention were compared to overall facility averages. Of 250 patients screened, 59.2% (148/250) showed clinically significant CMD symptoms and 92.6% (137/148) enrolled in CETA. 10.2% of enrolled (14/137) had current suicidal ideation. After four CETA visits, CMD symptoms decreased >50% and suicidal ideation decreased 100%. Patients enrolling in CETA had an ART initiation rate of 97.1% (133/137), one-month retention of 69.2% (89/129), and three-month retention of 82.4% (89/108). Overall facility retention averages were 66.0% at one month and 68.0% at three months. Four sessions of CETA decreased CMD symptoms by >50% and suicidal ideation by 100%. CETA patients had 14.4% higher absolute three-month retention versus overall facility averages. CETA is a promising approach to reduce symptoms of CMDs and improve HIV care cascade outcomes in areas with high HIV prevalence.

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Contributions:
BHW and VFJC conceived the idea and led the implementation of the study. AM supervised study implementation and data collection in health facilities with input from NM, BHW, VFJC, WH, CM, and SD. SD served as the lead CETA supervisor and expert. LH and WH helped with overall study coordination. WH conducted analyses under supervision of BHW and with input from VFJC, AM, LH, SD, and NM. WH wrote the first draft of the manuscript under the supervision of BHW and with input from VFJC, AM, VFJC, CM, LH, SD, and NM. All authors read the final manuscript and provided key scientific inputs.

Corresponding Author:
Wilson H. Hammett, MPHc
Department of Global Health
University of Washington
1959 NE Pacific Street, Seattle, WA 98195
Tel: 001-540-250-8404; Email: whhammett@gmail.com

INTRODUCTION:

Common mental disorders (CMDs) such as depression, anxiety, post-traumatic stress (PTS), substance use disorders, and suicidal ideation are common in people living with HIV (PLWH) and are associated with reduced probability of initiating and adhering to HIV treatment[2-6], lower probability of viral suppression[2], and more rapid disease/symptom progression[1,2,5]. An estimated 12.6%[10,11] of the population of Mozambique are living with HIV/AIDS, but only 68% of those who initiate ART are retained in care at 12 months and the rates of viral suppression are largely unknown[12]. There is a clear need for increased focus on providing treatment for CMDs among PLWH in Sub-Saharan Africa and other LMIC settings with high HIV+ populations.[13] Few LMICs have scaled up treatment for CMDs and/or evaluated the effect of such treatments on ART initiation, ART retention, and viral suppression.[5]

The Common Elements Treatment Approach (CETA) is a trans-diagnostic task-shared individual psychological intervention that treats multiple CMDs, including depression, anxiety, PTS, and substance use disorder, and which includes safety modules for suicidal ideation and violence.[14] CETA includes flexibility to address specific co-morbid CMDs and the intervention has been successful in reducing the symptoms and disability associated with CMDs in several LMICs, including Iraq[15] and Thailand[16]. CETA is also the subject of ongoing trials in various other LMIC settings[17,18]. However, the effects of CETA treatment on HIV outcomes, such as retention in care or viral suppression, have not previously been evaluated.

The present study aimed to evaluate the integration of CETA into public HIV care in Sofala, Mozambique and evaluate initial programmatic effects on mental health symptoms and retention in care.

METHODS:

Study Procedures

Efforts to scale-up public-sector mental healthcare delivery are underway in Mozambique[19]. Yet, existing mental health treatment services do not have formal links with HIV programming, and HIV+ patients are not routinely screened for CMDs or suicidal ideation. The current public-sector mental healthcare system

primarily treats severe mental illness (such as schizophrenia), neglecting patients with CMDs[20]. CETA was implemented in Mozambique through a HRSA funded PEPFAR demonstration project beginning in March 2019. Prior to CETA implementation, training materials, data tools, counselor manuals, and treatment protocols were adapted to the Mozambican context. CETA was implemented in five Ministry of Health primary care facilities offering comprehensive HIV services in Beira City, Sofala Province, Mozambique beginning in March 2019. All newly-diagnosed HIV+ patients were screened for CMDs by trained CETA lay counselors using a brief, validated mental health screening tool designed to screen for depression, anxiety, alcohol abuse/dependence, and suicidal ideation. Patients who demonstrated symptoms of CMDs in the brief initial screening were invited to enroll in CETA. At enrollment, patients were then administered a more comprehensive version of the initial CMD screening tool, as well as an adapted Harvard Trauma Questionnaire[21], to monitor symptom severity at baseline and to inform CETA module selection and treatment sequencing. This more comprehensive tool, referred to as the "comprehensive CMD symptom monitoring tool" combines elements of CMD screening tools validated in Mozambique and is designed to guide CETA counselors in determining the particular treatment modules that each patient should receive. Using measurement-based care principles, at each follow-up session lay counselors again administered this same comprehensive CMD symptom monitoring tool to track symptom severity and treatment progress over time and to inform treatment modification.

In March 2019, 16 lay counselors with prior experience working in the health system, at least a high school education level, and no prior mental health training were purposively sampled from the local community and enrolled in a 10-day in-person CETA training led by international CETA experts (SD and CM). Lay counselors had to be literate and understand spoken Portuguese. Counselor training followed CETA international guidelines for training and supervision[13] organized around the apprenticeship model[16]. During the training, five of 16 lay counselors were selected to be supervisors, with each supervising a group of lay counselors allocated to one of five implementation facilities. Following the 10-day in-person training, counselors engaged in one month of practice groups led by their local supervisor and a local program coordinator (AM). In these practice groups and throughout CETA treatment delivery, the lay supervisors

and program coordinator received regular, weekly distance phone/video supervision by a CETA expert (CM), creating a layer supervision approach[22]. After the month of practice groups, counselors who showed mastery of CETA skills were allowed to recruit a single patient to closely track CETA quality of care, with close supervision from counselor-supervisors and the local program coordinator (AM). As counselors showed they could follow the CETA model with fidelity, they each gradually increased to a full patient case load (between five and 10 patients at any one time). During ongoing care, counselors role-play the therapy in group supervision meetings, prior to each weekly patient session, and receive feedback on their delivery of CETA in the past session. Local supervisors discussed each case and received support weekly through distance phone/video supervision by CM. CM herself is supervised by CETA developer SD, completing the apprenticeship layered supervision model.

Data Collection and Analyses

The present analyses include all newly-diagnosed HIV+ patients screened, enrolled, and treated from May 1st, 2019 – September 31st, 2019. Patients who were 18 years of age or older at the time of initial screening and were diagnosed as HIV+ met the inclusion criteria. HIV data were collected by matching patient identifiers from CETA enrollment data to HIV treatment data. HIV treatment data were included through October 31st, 2019 to account for those patients who enrolled in CETA shortly before the September 31st cut-point. For a programmatic comparison group, we used overall facility averages for the five participating health facilities collected by CDC-Mozambique.

According to CDC-Mozambique, one-month retention refers to the percentage of adults newly-enrolled in ART who return for a second consultation or ART pickup within 33 days of treatment initiation. three-month retention refers to the those who return between 61 and 120 days after ART initiation. Those who had not been enrolled in ART for more than three months at the time of data collection were not included when calculating three-month retention.

Descriptive analyses were used to summarize demographic information and mental health symptoms of the study population at baseline and to compare HIV retention among CETA-enrolled patients to overall health facility averages obtained for the five study facilities from CDC-Mozambique.

Ethics

This study was reviewed and approved by both the University of Washington Institutional Review Board and the Institutional Review Board of the National Institute of Health in Mozambique.

RESULTS:

Of the 250 newly-diagnosed HIV+ individuals screened for CMD, 59% (n=148) showed clinically-significant symptoms of one or more CMD. Of the 148 who met the criteria for enrollment, 92.6% (n=137) enrolled in CETA. The median age of patients enrolled in CETA was 30, 61.3% (n=84) were female, 44.5% were single (n=61), and 16.0% were divorced, separated, or widowed (n=22), and 65.7% had 0-2 children (n=90); (see Table 1).

At baseline, 10.2% (n=14) of the 137 CETA-enrolled patients reported current suicidal ideation and 2.1% (n=3) reported current other violent ideation (see Table 2). No patients who attended three or more CETA visits demonstrated continued suicidal or other violent ideation (CETA recommends 6-12 visits in a typical treatment course). The average overall mental health symptom score (combining depression, anxiety, trauma, substance use, suicidal ideation, and other violent ideation reported on the comprehensive CMD symptom monitoring tool) at baseline was 19.8 (range= 3-38), decreasing 58% to 8.3 (range= 0-24) after 4 CETA visits and 92% to 1.5 (range= 0-4) after seven CETA visits (see Table 2).

97.1% (n=133) of 137 CETA-enrolled patients initiated ART (see Table 2). One-month retention for CETA-enrolled patients was 69.2%, compared to 66.0% for all HIV+ patients in participating facilities (a comparison group that includes those offered CETA who participated, those offered CETA who declined, and those who did not meet enrollment criteria and were not offered CETA). Three-month retention for CETA-enrolled patients was 82.4%, compared to 68.0% among all HIV+ patients. One-month retention for patients who attended 7 or more sessions (n=8) reached 87.5%, while three-month retention reached 100% for those who attended 6 or more CETA sessions (n=16). Table 2 details the change in mental health and HIV treatment outcomes by number of visits attended. Figure 1 shows three-month retention for CETA-

enrolled patients compared to overall retention averages, by study facility. In all five study facilities, CETA-enrolled patients showed higher rates of three-month adherence to ART.

DISCUSSION:

In this demonstration project, over 50% of all newly-diagnosed HIV+ patients in Mozambique had clinically-significant mental health symptoms at diagnosis and over 10% had current suicidal ideation. Considering the national HIV program in Mozambique does not currently conduct routine CMD screening for HIV patients, this indicates a very large under-served burden of CMDs among newly-diagnosed HIV+ individuals. CETA delivered in routine HIV platforms appears to effectively decrease CMD symptoms, along with suicidal and other violent ideation. Furthermore, preliminary programmatic analyses suggest that CETA may lead to a more than 14% absolute increase in retention in HIV care. Given the use of programmatic data, the effect of CETA on retention in HIV care could be larger than observed since the comparator combined the retention of both CETA-enrolled and CETA-non-enrolled patients. In addition, the 14% absolute increase could also be considered a lower-bound of improvement given it was calculated using all CETA-eligible patients who enrolled in CETA treatment, irrespective of the ultimate number of CETA sessions received (in a sort of intention-to-treat analysis). For example, those patients who attended three CETA follow-up sessions had 19% higher retention and those attending six CETA sessions had 32% higher retention (achieving 100% overall three-month retention), supporting findings in US studies of retention in HIV treatment among those receiving mental health treatment[23]. A larger, longitudinal study may provide more insight into the relationship between adherence to CETA and retention in HIV treatment. Heterogeneity among the participating facilities should also be explored in future studies in order to better understand why 3-month adherence among CETA-enrolled patients was higher at certain study facilities than at others.

While prior studies have implemented lay counselor-delivered or task-shared CMD interventions among PLHIV in LMIC settings[24-28], the majority of these studies have evaluated intervention effects on CMDs and implementation outcomes related to intervention delivery. There is a gap in the literature regarding lay

counselor psychological interventions and their effect of on HIV treatment cascade outcomes such as retention in HIV care, ART adherence, and viral suppression[6,26,27,28]. Furthermore, few studies exist in LMICs targeting the scale-up of depression interventions within primary care platforms[29]. An urgent need exists for implementation research targeting how best to scale-up task-shared psychological interventions for addressing co-morbid CMDs among HIV+ patients in LMICs[30,31]. CETA appears to be a promising model to further the 95-95-95 HIV treatment goals in high-need areas globally.

Limitations

This implementation project utilized existing programmatic routine health information system data, limiting the availability of a no-treatment control group. In addition, data collection ended in September/October 2019 and thus many CETA patients in this preliminary cohort did not have sufficient treatment time to engage in the 6-12 sessions recommended by CETA developers to complete treatment. Planned future studies will aim to measure the effect of CETA on HIV treatment retention, mental health symptom severity, and viral load through high-quality controlled pragmatic trial designs.

Conclusion

A large proportion of HIV patients in Mozambique show clinically-significant mental distress at diagnosis, and over 10% have current suicidal ideation. CETA is a promising approach for improving HIV treatment cascade outcomes, while also improving CMD symptoms and suicidal ideation among newly-diagnosed HIV+ individuals in LMICs such as Mozambique. Future implementation research should examine the pragmatic effectiveness of CETA in a well-controlled larger pragmatic trial and examine implementation strategies to optimize cost-effectiveness.

REFERENCES:

1. Gaynes BN, O'Donnell J, Nelson E, et al. Psychiatric Comorbidity in Depressed HIV-infected Individuals: Common and Clinically Consequential. *General hospital psychiatry* 2015;37(4):277-282. doi:10.1016/j.genhosppsych.
2. Pence BW. The impact of mental health and traumatic life experiences on antiretroviral treatment outcomes for people living with HIV/AIDS. Journal of Antimicrobial Chemotherapy 2009; 63(4): 636-640. doi: 10.1093/jac/dkp006
3. Kaaya S, Eustache E, Lapidos-Salaiz I, Musisi S, Psaros C, et al. Grand Challenges: Improving HIV Treatment Outcomes by Integrating Interventions for Co-Morbid Mental Illness. PLoS Med 2013;10(5): e1001447. doi:10.1371/journal.pmed.1001447
4. Nakimuli-Mpungu E, Bass JK, Alexandre P, Mills EJ, Musisi S, Ram M, et al. Depression, Alcohol Use and Adherence to Antiretroviral Therapy in Sub-Saharan Africa: A Systematic Review. *AIDS Behav*. 2012;16:2101–2118. doi: 10.1007/s10461-011-0087-8
5. Chibanda D, Benjamin L, Weiss HA, Abas M. Mental, Neurological, and Substance Use Disorders in People Living With HIV/AIDS in Low- and Middle-Income Countries. *JAIDS J Acquir Immune Defic Syndr*. 2014;67:S54–67. doi: 10.1097/QAI.0000000000000258
6. Mayston R, Kinyanda E, Chishinga N, Prince M, Patel V. Mental disorder and the outcome of HIV/AIDS in low-income and middle-income countries: A systematic review. *AIDS* 2012;26:S117-S135. doi: 10.1097/QAD.0b013e32835bde0f
7. GBD 2017 Disease and Injury Incidence and Prevalence Collaborators. Global, regional, and national incidence, prevalence, and years lived with disability for 354 diseases and injuries for 195 countries and territories, 1990–2017: a systematic analysis for the Global Burden of Disease Study 2017. *Lancet.* 2018;392(1789–1858).
8. GBD 2017 Causes of Death Collaborators. Global, regional, and national age-sex-specific mortality for 282 causes of death in 195 countries and territories, 1980–2017: a systematic analysis for the Global Burden of Disease Study 2017. *Lancet*. 2018;**392** (1736–1788).
9. Brandt R. The mental health of people living with HIV/AIDS in Africa: a systematic review. *Afr J AIDS Res*, 2009;8:123–33. doi:10.2989/AJAR.2009.8.2.1.853
10. Centers for Disease Control and Prevention (CDC). Global HIV & Tuberculosis: Mozambique Country Profile. Centers for Disease Control and Prevention (CDC), 2018.
11. Institute for Health Metrics and Evaluation (IHME). GBD Compare Data Visualization: Mozambique. Seattle, WA: University of Washington, 2017.
12. U.S. President's Emergency Plan for AIDS Relief (PEPFAR). Mozambique Country Operational Plan 2019: Strategic Direction Summary. Washington, DC: PEPFAR, 2019.
13. UNAIDS. 90-90-90: Treatment for All. UNAIDS, 2020.
14. Murray LK, Dorsey S, Haroz E, Lee C, Alyasiry MM, Haydary A, Weiss W, Bolton P. A common elements treatment approach for adult mental health problems in low- and middle income countries. *Cognitive and Behavioral Practice* 2014. 21(2):111-123. doi:10.1016/j.cbpra.2013.06.005
15. Weiss W, Murray L, Zangana G, Mahmooth Z, Kaysen D, Dorsey S, Lindgren K, Gross A, Murray S, Bass J, Bolton P. (2015) Community-based mental health treatments for survivors of torture and militant attacks in Southern Iraq: a randomized control trial. BMC Psychiatry. Oct 14; 15(1):249. doi: 10.1186/s12888-015-0622-7
16. Bolton, P, Lee C, Haroz EE, Murray L, Dorsey S, Robinson C, Ugueto A, Bass J. (2014) A Randomized Controlled Trial of a Transdiagnostic Community-Based Mental Health Treatment for Comorbid Disorders among Burmese Refugees in Thailand. PLOS Medicine. Nov 11. doi: 10.1371/journal.pmed.1001757
17. J. C. Kane, S. Skavenski Van Wyk, S. M. Murray, P. Bolton, F. Melendez, C. K. Danielson, P. Chimponda, S. Munthali and L. K. Murray. Testing the effectiveness of a transdiagnostic treatment approach in reducing violence and alcohol abuse among families in Zambia: study protocol of the Violence and Alcohol Treatment (VATU) trial. Global Mental Health 2017;4. doi:10.1017/gmh.2017.10

18. Murray LK, Haroz EE, Doty SB, Singh NS, Bogdanov S, Bass J, Dorsey S, Bolton P. Testing the effectiveness of a brief version of the Common Elements Treatment Approach (CETA) in Ukraine: A study protocol for a randomized control trial. *Trials*. 2018;19(418). doi: 10.1186/s13063-018-2752-y
19. Fortunato dos Santos P, Wainberg ML, Caldas-de-Almeida JM, Saraceno B, de Jesus Mari J. Overview of the mental health system in Mozambique: addressing the treatment gap with a task-shifting strategy in primary care. *Int J Mental Health Syst.* 2016;10(1). Doi: 10.1186/s13033-015-0032-8
20. Wagenaar BH, Cumbe V, Sherr K. Outpatient mental health services in Mozambique: Use and treatments. *Psychiatr Serv*. Jun 2016;67(6):588-590. Doi: 10.1176/appi.ps.201500508
21. Harvard Program in Refugee Trauma. Harvard Trauma Questionnaire (HTQ). Harvard Program in Refugee Trauma. 2011.
22. Murray LK, Dorsey S, Bolton P, Jordans MJD, Rahman A, Bass J, et al. Building capacity in mental health interventions in low resource countries: An apprenticeship model for training local providers. *Int J Mental Health Syst*. 2011;5(30). Doi: 10.1186/1752-4458-5-30
23. Himmelhoch S, Brown CH, Walkup J, Chandler G, Korthius PT, Afful J, et al. HIV patients with psychiatric disorders are less likely to discontinue HAART. *AIDS*. August 2009;23(13):1735-1742. Doi: 10.1097/QAD.0b013e32832b428f
24. Nachega JB, Adetokunboh O, Uthman OA, Knowlton AW, Altice FL, Schechter M, et al. Community-based interventions to improve and sustain antiretroviral therapy adherence, retention in HIV care and clinical outcomes in low- and middle-income countries for achieving the UNAIDS 90-90-90 targets. *Current HIV/AIDS Reports*. July 2016;13:241-255. doi: 10.1007/s11904-016-0325-9
25. Sikkema KJ, Dennis AC, Watt MH, Choi KW, Yemeke TT, Joska JA. Improving mental health among people living with HIV: A review of intervention trials in low- and middle- income countries. *Global Mental Health*. 2015;2. doi: 10.1017/gmh.2015.17
26. Chibanda D. Depression and HIV: Integrated care toward 90-90-90. *International Health*. March 2017;9(2):77-79. doi: 10.1093/inthealth/ihw058
27. Nyamayaro P, Bere T, Magidson JF, Simms V, O'Cleirigh C, Chibanda D, et al. A task-shifting problem-solving intervention for depression and barriers to anti-retroviral therapy adherence for people living with HIV in Zimbabwe: Case series. Cognitive and Behavioral Practice. February 2020;27(1):84-92. doi: 10.1016/j.cbpra.2018.10.003
28. Magidson JF, Joska JA, Myers B, Belus JM, Regenauer KS, Andersen LS et al. Project Khanya: A randomized, hybrid effectiveness-implementation trial of a peer-delivered behavioral intervention for ART adherence and substance use in Cape Town, South Africa. Implementation Science Communications. March 2020;1(23). doi: 10.1186/s43058-020-00004-w
29. Wagenaar BH, Hammett WH, Jackson C, Atkins DL, Belus JM, Kemp CG. Implementation outcomes and strategies for depression interventions in low- and middle-income countries: A systematic review. *Global Mental Health*. 2020;7. doi: 10.1017/gmh.2020.1
30. Department of Mental Health and Substance Abuse: World Health Organization. Mental Health Atlas 2017: Mozambique, Geneva, Switzerland, 2017.
31. Wagenaar BH, Cumbe V, Raunig-Berhó M, Rao D, Napúa M, Hughes JP, Sherr K. Health facility determinants and trends of ICD-10 outpatient psychiatric consultations across Sofala, Mozambique: Time-series analysis from 2012-2014. *BMC Psychiatry* 2015; 15(227). doi: 10.1186/s12888-015-0609-4

Table 1: Descriptive statistics of 137 CETA-enrolled patients

Characteristic	**N (% total enrolled)**		
Total Enrolled in CETA			137 (100%)
Average # CETA visits			3
Age	Mean	Median	Range
	30.1	30	18-58
18-24			42 (30.7%)
25-31			46 (33.6%)
32-38			28 (20.4%)
39-45			15 (10.9%)
≥ 46			6 (4.4%)
Sex			
Male			53 (38.7%)
Female			84 (61.3%)
Missing			0 (0.0%)
Civil Status			
Single			61 (44.5%)
Officially Married			31 (22.6%)
Domestic Partnership			23 (16.8%)
Divorced or Separated			14 (10.2%)
Widowed			8 (5.8%)
Children (n, % total enrolled)			
0-2			90 (65.7%)
3-5			29 (21.2%)
6 or more			5 (3.6%)
Missing			13 (9.5%)

Table 2: CETA outcomes, and HIV initiation/retention of 137 CETA-enrolled patients

Group	**Visit 1**	**Visit 2**	**Visit 3**	**Visit 4**	**Visit 5**	**Visit 6**	**Visit 7**
Total Enrolled (N)	137	81	54	44	28	16	8
Initiated ART (N)	133	80	53	43	27	15	8
Initiated ART (%)	97.1	98.7	98.1	97.7	96.4	93.8	100.0
1-month retention (%)	69.2	70.0	75.5	72.1	66.7	80.0	87.5
3-month retention (%)	82.4	81.8	87.2	90.0	91.7	100.0	100.0
Suicidal Ideation (%)	10.2	9.9	0.0	0.0	0.0	0.0	0.0
Other Violent Ideation (%)	2.1	1.2	0.0	0.0	0.0	0.0	0.0
Average Overall Symptom Score	19.8	16.2	12.7	8.3	6.0	2.9	1.5

Figure 1: 3-month HIV retention of CETA-enrolled patients by facility, compared to overall HIV retention averages