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An evaluation of TransLife Care: A locally developed structural HIV prevention intervention for Transgender Women in Chicago, IL

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Abstract

Transgender women are disproportionately impacted by HIV infection. We report herein findings of a pre-post evaluation of the TransLife Care (TLC) project (Chicago, Illinois) on behaviors associated with HIV transmission among transgender women. Participants who received any TLC component, versus those who did not, were compared, using mixed effects logistic regression with random intercepts across follow-up time points. Ninety-seven participants aged 18 to 59 (median age 24) enrolled; 76.3% were transgender women of color. There was a decrease in condomless sex without consistent PrEP use at 8-months which was not significantly different between those who did and did not receive the TLC intervention, controlling for calendar time. Evidence does not indicate that the TLC reduces condomless sex without PrEP protection among urban transgender women, however, given the preponderance of evidence of the influence of structural barriers on condomless sex, future research should continue to test the efficacy of structural interventions.

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Authors contributions

LMK, JP, JLP and ALH conceptualized the study and designed the study methods. ALH completed the analysis. Funding was awarded to LMK and JP. The original manuscript draft was prepared by LMK and ALH. LMK, JP, AKJ, JLP, KP, KE, DJD, DJG, PAB, MC, ALM, RG, and ALH edited versions of the manuscript and reviewed the final manuscript.

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Ethics statement:

This study was reviewed and approved by the Lurie Children's IRB, and the procedures followed were in accordance with the Helsinki Declaration as revised in 2013. The participants provided written informed consent to participate in this study.

Keywords

HIV prevention intervention; transgender women; structural intervention

Introduction

Transgender (trans) women in the United States (U.S.) have an estimated HIV prevalence of 42% (varying by race/ethnicity) based on a 7-city Centers for Disease Control and Prevention (CDC) National HIV Behavioral Surveillance findings in 2019–2020, with evidence of high rates of socioeconomic challenges that reflect competing personal needs (e.g., income, housing, healthcare access) (Center for Disease Control and Prevention, 2021). Trans women in the US face high levels of discrimination and exclusion from healthcare, housing and employment, which increases their vulnerability to HIV infection through multiple mechanisms (e.g., substance use, sex work, homelessness)(Brennan et al., 2012; Grant JM, 2011). To meet the Ending the HIV Epidemic goals in the United States by 2030, effective interventions must be developed and tested among people with disproportionate risk of acquiring HIV, such as trans women, including combination approaches that facilitate and promote access to pre-exposure prophylaxis (PrEP) (Fauci et al., 2019). As noted in the CDC report, effective HIV prevention efforts will require collaboration beyond traditional settings and with community members and organizations serving the trans community that address the whole person comprehensively (i.e., not just HIV risk) to meet competing needs. The TransLife Care (TLC) project at Chicago House and Social Service Agency was developed to address the psychosocial and structural factors often related to vulnerability for HIV among urban trans women, including unstable housing, unemployment, legal issues, and reduced access to health services. Addressing these basic needs may result in HIV-related protection via their impact on economic and housing stability and access to healthcare, which are associated with reduced sexual risk for HIV infection (Adimora & Auerbach, 2010; Center for Disease Control and Prevention, 2022b, 2022c). A prior study demonstrated positive effects of the TLC on HIV care engagement among trans women living with HIV, thus in the study described herein, we expanded evaluation to HIV prevention, including promotion of PrEP (Kuhns et al., 2021).

The purpose of this study was to evaluate the efficacy of the TLC to reduce condomless sex without PrEP protection 8-months post entry into TLC services. Given the emphasis of the TLC to address structural barriers, as a secondary question, we sought to evaluate the effect of the intervention on stable housing and employment.

Methods

Described herein is a single arm, non-randomized evaluation of the effect of the TLC intervention on condomless sex not protected by pre-exposure prophylaxis at 4- and 8-months post-enrollment among participants in the TLC project. This is a pragmatic evaluation because the intervention is a homegrown, pre-existing intervention, thus randomization (to control) was not possible or ethical in the programmatic environment. Participants could choose whether to receive each of the intervention components based

on personal preference and need. All study procedures were approved by the Institutional Review Board of Ann & Robert H. Lurie Children's Hospital of Chicago with a waiver of parental permission for participants aged 17 and written consent obtained for all participants.

TLC Intervention

The TLC intervention includes a drop-in center providing a “one stop shop” of bundled housing, employment, legal, and outreach-based health services (i.e., triage, health education, and referral), in addition to HIV prevention services (Center for Disease Control and Prevention, 2016). The drop-in center provides a safe space to socialize and to be connected to these services to meet basic needs. The TLC intervention addresses the specific structural and social factors that impact outcomes along the prevention and care continuum among transgender women (Hotton et al., 2020), drawing on a social determinants theoretical model of HIV risk (Beltran et al., 2011; Sharpe et al., 2010). A key aspect of the TLC multi-component intervention is the transgender-specific nature of services (i.e., developed for and by transgender women), delivered by transgender staff, whenever possible. In addition, TLC services are provided to transgender women regardless of HIV status (Kuhns et al., 2021), although participation in the program evaluation, detailed herein, was restricted to HIV-uninfected participants (Rhodes et al., 2021).

The TLC program facilitates direct access to basic services (e.g., housing, employment, legal aid, and health services), and may promote other protective processes through its drop-in center, including affirmation of gender identity and collective and supportive experiences to reduce behaviors associated with HIV transmission (Hendricks & Testa, 2012; Testa et al., 2015). Similar to the impact of multiple psychosocial conditions on HIV risk factors, resiliency processes may be additive in risk-reduction (Hendricks & Testa, 2012; Testa et al., 2015). A detailed description of TLC services can be found in prior publications. (Kuhns et al., 2021; Rhodes et al., 2021)

Study sample

Between January 2019 and February 2020, transgender women were enrolled in this evaluation of the TLC intervention at Chicago House and Social Service Agency in Chicago, Illinois, using a convenience sampling approach. New registrants in the TLC were approached to participate in the evaluation and were enrolled, if eligible and interested. Eligibility criteria included: (a) identifying as transgender, transfeminine, and/or female and assigned male sex at birth; (b) 17 years of age; (c) self-reported history of sex with men in the past 4 months; (d) negative/non-reactive HIV screening test at baseline; (e) able to speak/understand English; (f) willing and able to provide informed consent; (g) intend to reside in the local area throughout the 8-month follow-up period; and (h) had no exposure to any component of the TLC intervention in the prior 4 months. Individuals were excluded if they were unable to provide informed consent due to severe mental or physical illness, or intoxication at the time of interview (those excluded could re-screen if symptoms resolved).

Data Collection and Measures

At the point of enrollment, participants completed a baseline questionnaire via computer-assisted interviewing, which included demographic characteristics, health behaviors, and

psychosocial factors. Participants were followed with measures repeated at 4- and 8-months post-enrollment, respectively. Data for the enrollment visit were collected on-site at the TLC via self-administered web-based questionnaire (i.e., participants were provided a private space to complete it on site) and at follow-up were collected primarily remotely due to the COVID-19 pandemic (as of March 2020), captured in web-based format. Due to changes in the assessment due to COVID-19 (a truncated assessment for remote deployment), for a period of 3 months (mid-March to mid-June 2020), data on secondary outcomes for housing and employment were not collected, resulting in missing data for that period. Participants received \$50 token of appreciation for completion of each study visit.

Sociodemographic characteristics

Sociodemographic information collected included age (in years), race/ethnicity, sexual orientation/identity, highest level of education, current income, current employment, history of incarceration, and current housing status.

Primary outcome: recent sexual risk factors for HIV acquisition not protected by PrEP

We measured recent (past 30 days) condomless anal/vaginal sex (Yes, No) with items from the AIDS Risk Behavior Assessment (ARBA), adapted for trans women (Garofalo et al., 2018). In addition, recent protective PrEP use was measured as consistent (daily) PrEP use in the prior 30 days (NB: no participants reported use of other PrEP dosing). We used a series of items: Have you taken PrEP in the last month? “Please indicate whether or not you have taken PrEP on each day during the past month, beginning with yesterday (timeline follow-back approach with calendar; coded on a scale of 0–100% adherent). The primary outcome was coded as any reported condomless anal or vaginal sex without protective levels of PrEP (defined as report of PrEP use less than 4 days per week in the past month).

Secondary outcomes: Employment, housing

We assessed employment status with the item, “Please indicate which of the following is true for you regarding your current work status? The responses were coded with “working for pay at a job or business,” versus all others. We assessed housing status with the item, “Which of the following best describes your current living situation? By current living situation, we mean where have you been staying during the past seven days?” Responses coded to reflect “your own place, a room, apartment, or house that is your home” versus all others (e.g., jail/prison, drug treatment, transitional housing, hotel/motel).

Intervention exposure

All participants were registered as TLC program participants, which includes an initial evaluation of needs and referrals to services, but not all sought out and/or received related services. Intervention exposure was abstracted from TLC program records at 4-month intervals by type of intervention component (e.g., assistance with housing, employment, on-site medical care and education, legal services) and total hours of exposure across all intervention components for each period. We also calculated the cumulative number of hours of intervention exposure through the end of each 4-month period for descriptive purposes but analyze intervention effects as time varying so that the timing of intervention receipt and

study outcomes were more closely aligned. Due to the COVID-19 pandemic, the in-person TLC intervention was paused for the duration of the study observation period on March 13, 2020, thus only remote intervention services were provided to participants thereafter, e.g., via phone call/email/web evaluation and referral, which were also tracked as intervention activities (in each service category, respectively).

Analysis

This analysis was conducted to assess the effectiveness of the TLC for reducing condomless sex, except in the context of consistent PrEP use. The primary outcome was any report of past-month condomless anal or vaginal sex (CAVS) without consistent PrEP use. We used mixed effects logistic regression with random intercepts to assess the impact of the intervention across all follow-up time points. Models include an indicator for intervention group, time, and a group by time interaction term. Additionally, due to the non-randomized design, all models controlled for the baseline value of the outcome and age, race/ethnicity, sexual identity, and history of sexually transmitted infections at baseline to account for imbalances between those who did and did not receive the intervention. We also controlled for calendar time, defined as time in months from January 1, 2019, to account for confounding due to trends related to the COVID-19 pandemic. The primary intervention effect was assessed via the statistical significance of the group by time interaction, which indicates whether the difference between groups varies over time. Data were analyzed using Stata/SE version 17.0 (Stata Corp, College Station, TX).

Results

Sample characteristics

A total of 103 of 120 TLC participants screened were eligible for the evaluation, and of those, 99 non-duplicated individuals were enrolled between January 2019 and February 2020. Two participants were withdrawn for non-completion of the baseline, for a total of 97 in the final sample. Follow-up assessments continued through August 2021. Participants included transgender women between the ages of 18 and 59 (median age= 24); 54.6% identified as non-Hispanic Black and 21.7% as Hispanic/Latina. Other demographic characteristics are shown in Table 1.

Intervention exposure

Of the 97 participants, 48 received any intervention components and 49 received no intervention. Among those who received any TLC component, the most utilized services were drop-in services and medical care (Table 2). At baseline, characteristics of those who received vs. did not receive the intervention were visually inspected for imbalance. Compared to those who did not receive the intervention, participants who received the intervention were less likely to identify as gay or lesbian or as Latina/x or Hispanic and to report any STI history (Table 1).

In terms of retention, overall, 89 (91.8%) completed at least one study follow-up visit; and 65 (67.0%) completed all three study visits. Those who received the intervention were more

likely to complete at least one follow up visit than those who did not (100% vs. 83%; Table 1).

Evaluation of intervention efficacy

Condomless sex not protected by PrEP—Overall, there was a decrease in behaviors associated with HIV transmission from baseline to 8-month follow-up which was not statistically significant after controlling for calendar time. This is consistent with likely reductions in sexual activity related to the COVID-19 pandemic, which began during follow-up. The proportion reporting any CAVS without consistent PrEP use decreased from 35.4% at baseline to 21.7% at 8 months in the intervention group and from 46.9% to 28.6% in the non-intervention group (Table 3). The mean number of condomless sex acts decreased from 1.88 (SD 5.73) to 1.21 (SD 3.49) from baseline to 8 months in the intervention group and from 2.47 (SD 4.47) to 0.86 (SD 2.00) in the non-intervention group. However, there were no statistically significant differences between the groups in terms of behavior change over time (Table 4, Supplement Figure 1).

Social determinants of health—The proportion of participants reporting stable housing increased from baseline to 4 months in the intervention group and then leveled off between 4 months and 8 months, whereas it declined and returned to baseline levels in the non-intervention group. Employment also increased over time in the intervention group from baseline to 4 months but then declined from 4–8 months, whereas there was a smaller but steady increase in employment from baseline to 8 months in the non-intervention group. The group by time interaction was not statistically significant for housing; the marginal significance of the interaction term for employment is difficult to interpret due to the reversal in direction of association between the groups from 4 to 8 months and is not necessarily substantively meaningful (Table 4, Supplement Figures 2 and 3).

Discussion

In this study, our findings did not support the hypothesized effects of the TLC intervention on either CAVS without PrEP protection or on change in structural outcomes, i.e., housing and employment status. While we observed a reduction in CAVS over time, this was likely attributable to general reductions in sexual behaviors associated with HIV transmission during the COVID-19 pandemic. More than 50% of our data at follow-up were collected during the pandemic, thus when we controlled for the effect of time, comparing those exposed and not exposed to the intervention, CAVS not protected by PrEP was not significantly different. In addition, while there were trends towards increases in housing (over both periods) and employment in the intervention group at 4 months (versus the non-intervention group), these were not significant and there appeared to be a negative non-significant trend in employment outcomes in the intervention group from 4 to 8 months.

While structural interventions have increasingly become a focus of HIV prevention efforts in the U.S. (Adimora & Auerbach, 2010; Phillips et al., 2021), evaluation of interventions that bundle together services to address basic needs, such as housing, employment, and legal services for transgender women, such as those provided at the TLC, are rare. (Center for Disease Control and Prevention, 2022a) The lack of detected effects for the

TLC, in addition to the COVID-19 interruption, may have been due to the relatively short timeline for exposure (8 months) for outcomes that may take longer to present and reliance on participants actively choosing to join the intervention, which may limit exposure, which are challenges sited in a prior review of evaluation methods for structural interventions (Iskarpatyoti et al., 2018). A study design with a longer and uninterrupted timeline is recommended for such evaluations.

With regard to outcomes associated with HIV transmission, the findings of this study do not support an effect of the TLC intervention on risk-reduction. Due to the interruption of the COVID-19 pandemic, exposure to the intervention was truncated, so we were not able to test the intervention effect per protocol. Prior work conducted by members of our research team and others suggests that among trans women, particularly younger trans women, economic vulnerability and homelessness contribute to exchanging sex for basic needs, which is related to HIV vulnerability (Amelia de Sousa Mascena Veras et al., 2021; Arrington-Sanders et al., 2022; Wilson et al., 2009), thus we feel that future intervention research should continue to target economic and social vulnerability.

In terms of the secondary outcomes, the trend in housing outcomes in the intervention group was one of increased housing access at 4 months followed by a leveling of the effect. The leveling effect is consistent with immediate effects of the TLC intervention (i.e., participants are immediately linked to housing resources and therefore the effect is often proximal to the intervention exposure), which we have observed in practice, but could have also been due to the COVID-19 related shutdowns in TLC services. The employment outcome trends are difficult to interpret due to the reversing of trends in the intervention group, i.e., first positive, then negative.

A major limitation of this study was the shutdowns due to the COVID-19 pandemic, which interrupted delivery of the TLC intervention, and did not allow us to deliver the intervention and evaluate it per protocol with the intended sample size of 150. In addition, the TLC is a drop-in center that serves trans individuals seeking assistance with basic health and social service needs and those who enrolled in the evaluation may have been different from all program participants; therefore, these findings may not be generalizable to the larger population of urban trans women in Chicago or in other cities. Finally, the participants were not randomized and while we controlled for baseline value of the outcome and age, race/ethnicity, sexual identity, and history of sexually transmitted infections at baseline to account for imbalances between those who did and did not receive the intervention, we could not control for all potential differences. This could lead to both an over and underestimate of the intervention effect.

Conclusion

We did not find evidence to support our hypothesis that the TLC reduces behaviors associated with HIV transmission among urban trans women. However due to the preponderance of evidence on the potential impact of socioeconomic and structural barriers on HIV risk factors and the interruption to the research plan due to the COVID-19 pandemic, future research should continue to explore interventions that target these factors.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1:

Participant characteristics at baseline by TLC intervention status (receipt of any intervention across follow-up), N=97

	Any intervention (n=48), n (%)	No intervention (n=49), n (%)	p-value
Demographics			
Age, Mean (SD)	29.18 (10.47)	26.21 (7.59)	0.166
Race/ethnicity			
White NH	11 (22.9)	6 (12.2)	0.085
Black non-Hispanic (NH)	25 (52.1)	28 (57.1)	
Latina/Hispanic	7 (14.6)	14 (28.6)	
Other NH	5 (10.4)	1 (2.0)	
Sexual identity			
Gay or lesbian	5 (10.4)	18 (36.7)	0.020
Straight	19 (39.6)	11 (22.5)	
Bisexual	8 (16.7)	6 (12.2)	
Other/unknown	16 (33.3)	14 (28.6)	
Education			
Less than HS	10 (20.8)	15 (30.6)	0.475
HS or GED	20 (41.7)	20 (40.8)	
More than HS	18 (37.5)	14 (28.6)	
Income			
<10k	35 (72.9)	33 (67.4)	0.770
10–20k	5 (10.4)	5 (10.2)	
20k	8 (16.7)	11 (22.5)	
Ever incarcerated	13 (27.1)	13 (26.5)	0.951
Currently employed	6 (12.5)	8 (16.3)	0.592
Currently housed	25 (52.1)	27 (56.3)	0.682
Behavioral outcomes			
Any STI history	9 (18.8)	17 (34.7)	0.076
Ever taken PrEP	13 (27.1)	18 (36.7)	0.308
PrEP use past 30 days	8 (16.7)	5 (10.2)	0.350
Any condomless anal/vaginal sex past 30 days	22 (45.8)	25 (51.0)	0.609
Any condomless anal/vaginal sex w/out PrEP ^a past 30 days	17 (35.4)	23 (46.9)	0.249
Follow-up completion ^b			
Completed 4-month follow-up	41 (85.4)	30 (61.2)	0.007
Completed 8-month follow-up	48 (100.0)	35 (71.4)	<0.001
Completed at least 1 follow-up visit	48 (100.0)	41 (83.7)	0.003
Completed all visits prior to COVID-19	20 (41.7)	20 (40.8)	0.932

^a. Any condomless vaginal/anal sex without taking PrEP at least 4 out of 7 days per week over the past month;

^b89/97 (91.8%) had any follow up; 71 (73.2%) completed 4m follow-up and 83 (85.6%) completed 8m follow-up; 65 (67.0%) completed all three visits

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Table 2:

Receipt of TLC intervention components over time among those who received any intervention

	4m^a, n=71	8m^a, n=83	All follow up, among those with at least 1 follow up visit^a, n=89
Any intervention	29 (40.9)	32 (38.6)	48 (53.9)
Drop-in	28 (39.4)	29 (34.9)	44 (49.4)
Medical care	12 (16.9)	8 (9.6)	18 (20.2)
Housing	2 (2.8)	4 (4.8)	6 (6.7)
Legal	4 (5.6)	1 (1.2)	5 (5.6)
Employment	4 (5.6)	2 (2.4)	5 (5.6)

^aColumn totals do not sum to 100 percent. The denominator includes anyone with a visit during the specified follow-up period; participants could receive multiple intervention components at multiple timepoints.

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Table 3:

Study outcomes over time by TLC intervention group

	Baseline, n=97	4m, n=71	8m, n=83
Any condomless anal/vaginal sex w/out PrEP ^a past 30 days	n (%) [obs]	n (%) [obs]	n (%) [obs]
Intervention	17 (35.42) [48]	12 (31.6) [38]	10 (21.7) [46]
No intervention	23 (46.9) [49]	8 (28.6) [28]	10 (28.6) [35]
PrEP use past 30 days			
Intervention	8 (16.7) [48]	5 (13.2) [38]	2 (4.4) [45]
No intervention	5 (10.2) [49]	3 (12.5) [24]	1 (3.0) [33]
Any condomless anal/vaginal sex past 30 days			
Intervention	22 (45.8) [48]	19 (46.3) [41]	12 (25.5) [47]
No intervention	25 (51.0) [49]	12 (40.0) [30]	11 (31.4) [35]
Full or part-time employment ^b			
Intervention	6 (12.5)[48]	13 (33.3) [30]	9 (25.0) [36]
No intervention	8 (16.3) [49]	6 (31.6) [19]	8 (34.8) [23]
Stable housing ^b			
Intervention	25 (52.1) [48]	20 (66.7) [30]	25 (69.4) [36]
No intervention	27 (56.3) [48]	9 (47.4) [19]	13 (56.5) [23]
Mean CAVS acts ^a past 30 days	Mean (SD) [obs]	Mean (SD) [obs]	Mean (SD) [obs]
Intervention	1.88 (5.73) [48]	1.90 (6.33) [41]	1.21 (3.49) [48]
No intervention	2.47 (4.47) [49]	1.47 (2.38) [30]	0.86 (2.00) [35]

^a. Any condomless vaginal/anal sex without taking PrEP at least 4 out of 7 days per week over the past month

^b. ~30% missing data on housing and employment at follow up due to changes in assessments related to COVID-19 Abbreviations: obs, observations; CAVS, condomless vagina/anal sex

Table 4:

Mixed effects logistic regression results

	Any CAVS without PrEP in past 30 days	Stable housing	Full or part-time employment
	OR (95% CI)^a	OR (95% CI)^a	OR (95% CI)^a
Intervention effect (Intervention vs. non-intervention at 4m)	0.96 (0.28–3.28)	3.21 (0.78–13.3)	1.40 (0.15–13.4)
Time effect (8m vs. 4m in control group)	0.88 (0.26–2.99)	1.67 (0.39–7.12)	7.84 (0.71–86.4)
Intervention x time interaction	0.82 (0.17–3.99)	0.71 (0.10–5.30)	0.050 (0.003–0.997)

^aAdjusted for baseline value of the outcome, time in months since Jan 1, 2019, age, race, sexual identity, and STI history at baseline

Abbreviations: OR, odds ratio; CI, confidence interval; CAVS, condomless anal or vaginal sex

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