Impact of supportive housing on immunological and virological status and antiretroviral therapy adherence amongst people living with HIV in Vancouver, Canada

Surita Parashar[1,2], Zishan Cui[1], Julia Zhu[1], Alexandra B. Collins[1,2], Allison Enjetti[1], Paul Sereda[1], Jaafar Aghajanian[1], Kate A. Salters[1,2]

1. BC Centre for Excellence in HIV/AIDS, Vancouver, Canada; 2. Faculty of Health Sciences, Simon Fraser University, Burnaby, Canada

Background

- Despite advances in antiretroviral therapy (ART), people living with HIV (PLHIV) who are homeless or unstably housed continue to experience poor clinical outcomes compared to their stably housed counterparts.
- Studies have shown that homelessness among PLHIV is associated with lower ART adherence, declining CD4 cell counts and higher odds of viral load detectability.
- We sought to characterize therapeutic and clinical outcomes among a sample of previously homeless or housing insecure PLHIV following entry into an HIV-specific supportive housing facility in a Canadian setting offering universal access to HIV treatment and care.

Methods

- The study sample consisted of individuals enrolled in a longitudinal cohort of **PLHIV 18 years of age or older living in an HIV-specific housing facility in Vancouver**.
- **Peer-administered surveys** collecting demographic and socio-behavioural data were conducted with participants at baseline (after admission to housing facility) and 12-18 month follow-up from March 2015 to October 2016.
- **Self-reported demographic and behavioural survey data were linked with clinical data** made available through a linkage with the provincial HIV treatment registry at the BC Centre for Excellence in HIV/AIDS.

Analysis

- Clinical outcomes were compared and assessed **pre-intervention (6 months** prior to moving into the housing facility) and **post-intervention (6 months after** moving into the housing facility).
- **Outcome variables of interest included:**
  - **Adherence**, based on pharmacy refill data, was dichotomized as optimal (≥95%) vs. sub optimal (<95%)
  - **Viral load** was dichotomized detectable (≥50 copies/mL) vs. undetectable (<50 copies/mL)
  - **CD4 cell count** was dichotomized as high (≥500 cells/μl) vs. low (<500 cells/μl)
  - **Treatment Interruption**, dichotomized as yes vs. no, was defined as interruption of ART for >90 consecutive days
- Kappa coefficient was calculated to assess agreement between categorical values for the four outcomes variables assessed with 0.0-0.2 representing slight agreement and 0.8-1.0 representing near perfect agreement.
- McNemar's p-value test (alpha=0.05) was applied to determine the probability of the outcome variables improving or remaining the same (versus becoming worse) relative to the intervention (moving into HIV-specific supportive housing facility).

Results

Table 1: Descriptive table of sample enrolled in an HIV-specific supportive housing facility in Vancouver, Canada, n=102

Variable		n (%)
Age (median, Q1-Q3)		52 (48-57)
Gender	Male	75 (73.5)
	Female	22 (21.6)
	Other	5 (4.9)
Sexual orientation	Homosexual/Lesbian/Queer/Bi/2spirit/Other	53 (52.0)
	Heterosexual	49 (48.0)
Ethnicity	Caucasian	50 (49.5)
	Indigenous	36 (35.6)
	Other	15 (14.9)
History of IDU	Yes	73 (78.5)
	No	20 (21.5)
Current sense of housing stability	Yes	92 (91.1)
	No	9 (8.9)
Previous sense of housing stability	Yes	43 (42.2)
	No	59 (57.8)
Years since moved into housing facility (median, Q1-Q3)		1.5 (0.8,1.6)
Years since treatment initiation (median, Q1-Q3)		9.1 (5.3,17.3)

Table 2: Comparison of ART adherence pre- and post-entry into HIV-specific supportive housing facility, n=92

		Post-intervention adherence		Kappa coefficient (95% CI)	McNemar p-value
		<95%	≥95%		
Pre-intervention adherence	<95%	30	13	0.3696 (0.180, 0.559)	0.578
	≥95%	16	33		

*Missing n=10

Table 3: Comparison of viral load pre- and post-entry into HIV-specific supportive housing facility, n=98

		Post-intervention viral load		Kappa coefficient (95% CI)	McNemar p-value
		Detectable	Undetectable		
Pre-intervention viral load	Detectable	9	8	0.4535 (0.219, 0.687)	0.796
	Undetectable	7	74		

*Missing n=4

Table 4: Comparison of CD4 cell count pre- and post-entry into HIV-specific supportive housing facility, n=97

		Post-intervention CD4 cell count		Kappa coefficient (95% CI)	McNemar p-value
		<500 cells/μl	≥500 cells/μl		
Pre-intervention CD4 cell count	<500 cells/μl	42	10	0.6914 (0.549, 0.834)	0.197
	≥500 cells/μl	5	40		

*Missing n=5

Table 5: Comparison of episodes of treatment interruption pre- and post-entry into HIV-specific supportive housing facility, n=91

		Post-intervention treatment interruption		Kappa coefficient (95% CI)	McNemar p-value
		Yes	No		
Pre-intervention treatment interruption	Yes	6	6	0.2516 (0.016, 0.487)	0.074
	No	14	65		

*Missing n=11

- In this setting, we observed that a large number of individuals were experiencing optimal clinical and virological health outcomes in both the pre- and post-intervention time periods.
- In this sample of 102 PLHIV who were provided with HIV-specific supportive housing, 35.9% maintained optimal adherence, 75.5% maintained viral suppression, 41% maintained high CD4 cell counts and 71.4% had no episodes of treatment interruption in both the pre- and post-intervention study period.
- The authors suggest that it is likely individuals who were selected for HIV-specific supportive housing were individuals who had achieved optimal therapeutic control of HIV and the housing intervention continued to facilitate these clinical successes.

Discussion

- Baseline data suggest that access to this HIV-specific housing facility was not associated with significant changes clinical and/or virological outcomes among this cohort of PLHIV
- Literature suggests that supportive housing is a structural intervention that may facilitate access to care and treatment, and improve health outcomes amongst PLHIV at risk of homelessness.
- Future studies may consider assessing other non-clinical health outcomes that may be influenced by supportive and stable housing interventions.

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For questions, email sparashar@cfenet.ubc.ca

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