Bridging Hospital and Community Care for Homeless Adults with Unmet Health Needs:

Outcomes of a Brief Interdisciplinary Intervention

Vicky Stergiopoulos, MSc, MD, MHSc, FRCPC
Physician-in-Chief, Centre for Addiction and Mental Health (CAMH)
Professor, Department of Psychiatry, University of Toronto
Associate Scientist, Centre for Urban Health Solutions, St. Michael's Hospital

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Background

Homelessness in Toronto

Despite a plethora of primary care, mental health and homelessness services, a 2007 survey[1] of over 350 homeless adults in Toronto found:

- 54% had been to the ED in the past year
- 24% had been hospitalized for at least one night
- 29% had no usual source of health care

Barriers to accessing care in a system of universal health insurance include:

- System fragmentation[2-5]
- Limited capacity of existing services[2-5]
- Stigma and discrimination[6,7]

CTI Models

- Critical Time Intervention (CTI)
  - **Time-limited, transitional** case management intervention (≤9 months)
  - Connects individuals with mental illness to a case manager **at point of discharge from institutional to community** settings in order to help bridge the gap between institution and the often-fragmented and uncoordinated community setting
  - Originally developed to reduce risk of homelessness among people leaving shelter but has been successfully adapted to support transitions from a range of institutions including hospitals and prisons

- RCT and observational evidence for effectiveness among intervention recipients:
  - Reductions in homelessness outcomes[8-12]
  - Improvements in mental health and substance use outcomes[8,11-14]
  - Reductions in hospital service use[15]
  - Improved experience of continuity of care[16-18]
  - Cost-effectiveness[9]

CATCH Program

- In 2010, the local health authority funded the **Coordinated Access to Care for Homeless People (CATCH)** program to address barriers to care for homeless people with unmet health needs presenting to hospital in Toronto, Canada

- Informed by the Critical Time Intervention (CTI) model, ***CATCH is a brief interdisciplinary case management intervention*** aiming to improve continuity of care and ultimately, health outcomes and health service use in this population[19]

- CATCH is a partnership of 3 local hospitals, a large community mental health agency, a homeless shelter, and a physician practice plan

- Services offered by CATCH case managers:
  - Home visits and assertive outreach
  - Crisis intervention and supportive therapy
  - Assistance in obtaining income supports and housing
  - Connecting clients to new service providers based in the community

CATCH Eligibility

- Current homelessness, defined as living on the street or in a crisis/emergency shelter or couch surfing
- Unmet physical or mental health needs, as identified by care providers
- Unmet support needs, as identified by participants
- Exclusion criteria included severe aggression or illness severity necessitating residential care

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CATCH Evaluation:
Objectives and rationale

CATCH Evaluation

- Objective
  - To evaluate the health and service use outcomes and associated factors among CATCH program participants
  - To understand the role of CATCH in supporting continuity of care

- Rationale
  - Post-hospital discharge is an important opportunity to engage homeless people in care and to decrease risk of adverse health and social outcomes
  - Strategies that aim to bridge the gap between institution and the often fragmented and uncoordinated community-based care for individuals with complex needs are urgently needed

Research Questions

1. What are the changes in health and service use outcomes?
   - Primary outcome: health status
   - Secondary outcomes: mental, substance use, housing, acute care service use, quality of life
   - The role of the Working Alliance
2. What is the experience of continuity of care?
   - Service user, provider, PWLE and system stakeholder perspectives of the role of brief interventions in supporting continuity of care for this population

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Methods

Design

- Mixed methods case study, realist lens
- Pre-post cohort design with 225 CATCH participants
- Post hoc analysis using a comparison group of homeless adults with mental illness who received
  usual services over the same period
- Qualitative interviews with CATCH participants and partner organization managers;
  and focus groups with CATCH staff, external service providers, and people with lived experience (PWLE) of homelessness (n=52)

Quantitative Measures

Study outcomes		Instrument		Baseline	3 months	6 months
Primary outcome	Physical health	SF-36	• Physical and mental composite scores (PCS and MCS)	*	*	*
Secondary outcomes	Acute care service use	Health and Social Service Use	• Number of emergency department visits in past 3/6 months • Hospital admissions in past 3/6 months	*	*	*
	Housing	Modified RTLFB Calendar	• Days spent homeless in past 3/6 months	*	*	*
	Mental health	Modified Colorado Symptom Index (CSI)	• CSI total score	*		*

	Substance use	Addiction Severity Index (ASI)	• ACOMP and DCOMP scores
			• Specific items from ASI:
			  • amount of money spent
			  • number of days experiencing problems
				*		*

	Quality of Life	Quality of Life Index, 20-item (QoLI-20)	• QoLI-20 total score	*		*
	Working Alliance with service provider	Working Alliance Inventory-Participant (WAI-PAR)	• 3 domain sub-scores (goals, task and bond) • Total summary score		*	*

Qualitative Interviews

Topic guide, soliciting "thick" description of:	Participant group			
	CATCH participants	CATCH staff	External providers	PWLE
Health and social service needs	*	*	*	*
Service availability and accessibility	*	*	*	*
Processes that enable timely access to appropriate, comprehensive services	*	*	*	*
Experiences with the intervention, including direct service provision and transfer to long-term providers	*			
Additional information on the intervention, contextualized within the larger service system		*		
Perspectives on the service system's capacity to serve people experiencing homelessness			*	*

Analysis

- Quantitative descriptive and correlational analyses, and longitudinal modelling of CATCH participant outcomes using linear mixed effects models and generalized estimating equations; post-hoc analyses to examine differences between CATCH participants and comparison group using linear and negative binomial regression models

- Multivariate imputation done using MICE

- Qualitative triangulated thematic analyses informed by existing frameworks for continuity of care while allowing for emergent themes

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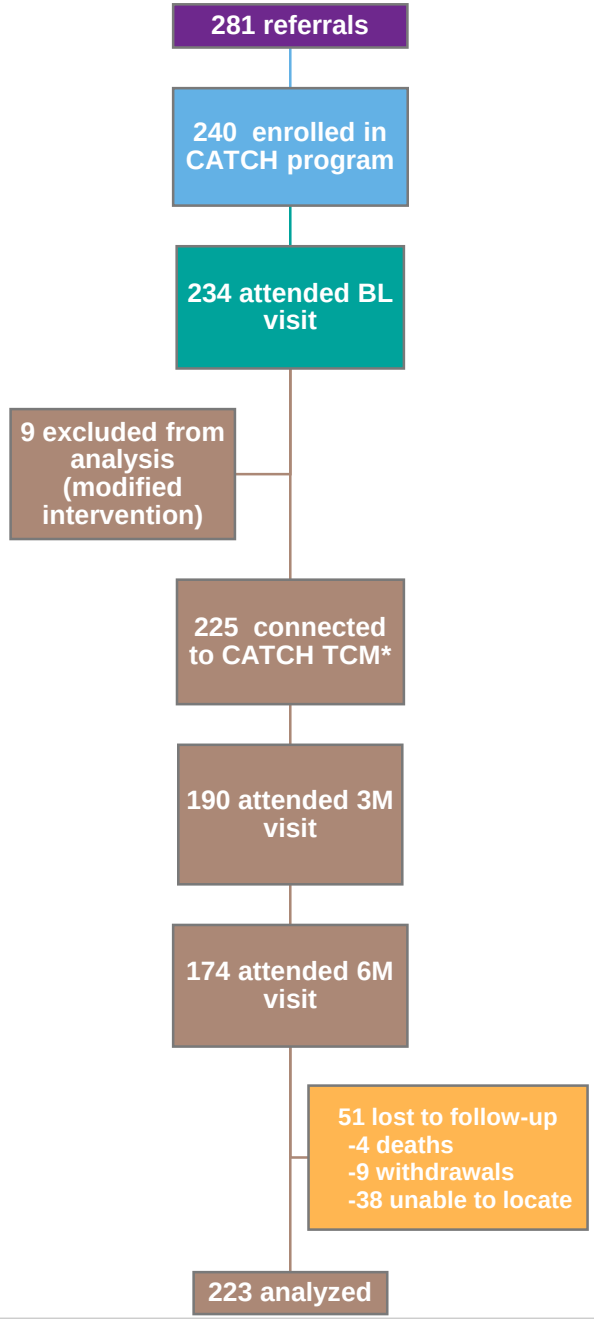
Results

Participant Flow

In addition to meeting CATCH program criteria, research study participants met the following criteria:

1. ≥ 18 years of age
2. never previously received CATCH services
3. has had contact with a CATCH case manager

In total, 225 CATCH study participants were connected to a case manager.



Baseline Demographic Characteristics

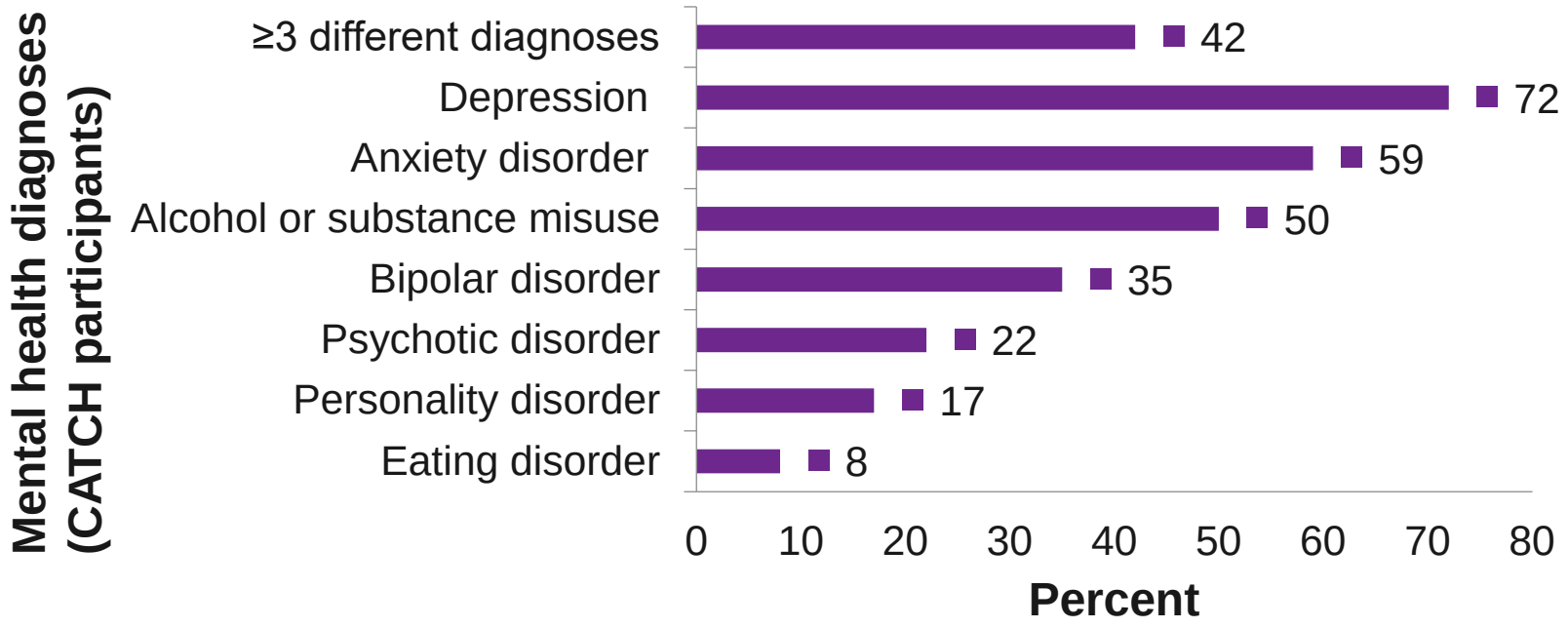
Characteristic		CATCH participants (n=223) N (%)	Comparison group (n=168) N (%)	P
Age (years), mean ± SD		40.0 ± 12.0	41.2 ± 12.0	0.30
Male		173 (77.6)	116 (69.1)	0.06
Canadian born		165 (74.0)	102 (60.7)	0.01
English main language		187 (83.9)	111 (66.1)	<0.001
Ethnicity or cultural identity[2] White		153 (68.6)	75 (44.6)	<0.001
Single, never married		135 (60.5)	106 (63.1)	0.61
Has at least one child under 18 years of age		70 (31.4)	48 (29.1)	0.63
Education	Less than high school	109 (49.3)	68 (41.0)	0.10
	Completed high school	40 (18.1)	44 (26.5)	
	Completed college/university/grad school	72 (32.6)	54 (32.5)	
Unemployed		206 (92.4)	162 (96.4)	0.09
Total income past month ($CAD)	< $500/month	76 (35.4)	50 (29.9)	0.28
	≥ $500 to $1000/month	88 (40.9)	82 (49.1)	
	≥$1001 or more/month	51 (23.7)	35 (21.0)	
Single longest period of homelessness[3]	<1 month to < 1 year	132 (60.6)	66 (39.3)	<0.001
	≥ 1 year to <3 years	40 (18.4)	52 (31.0)	
	≥ 3 years	46 (21.1)	50 (29.8)	

[1] The following variables had missing data: children under 18 yrs. (n=3), education (n=4), unemployment (n=1), total monthly income (n=9), longest period of homelessness (n=5)
[2] Four ethnic/cultural categories were used (White, Ethnoracial, Aboriginal and Other); however due to small cell size in some categories, the they are not shown here.
[3] The mean ± SD for single longest duration of homelessness was 1.8 ± 2.9 years and 3.0 ± 2. 9 years for CATCH and comparison group participants, respectively. The median (IQR) was 0.58.0 (0.17,2.00) and 1.00 (0.42, 3.00) for CATCH and comparison group participants, respectively.

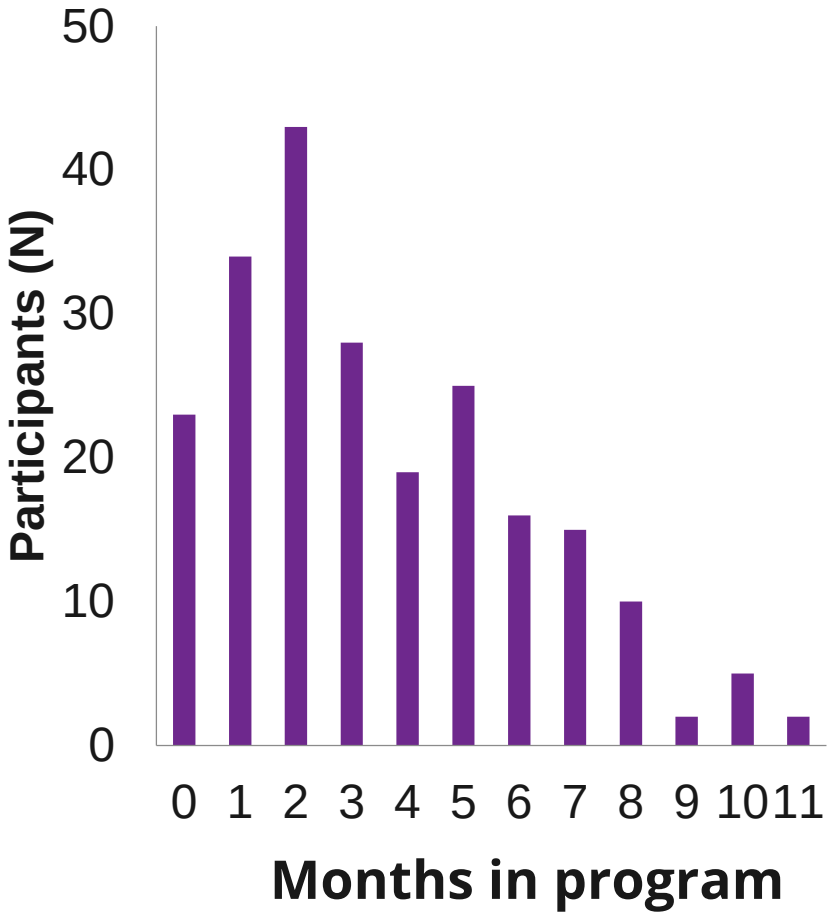
Baseline Clinical Characteristics

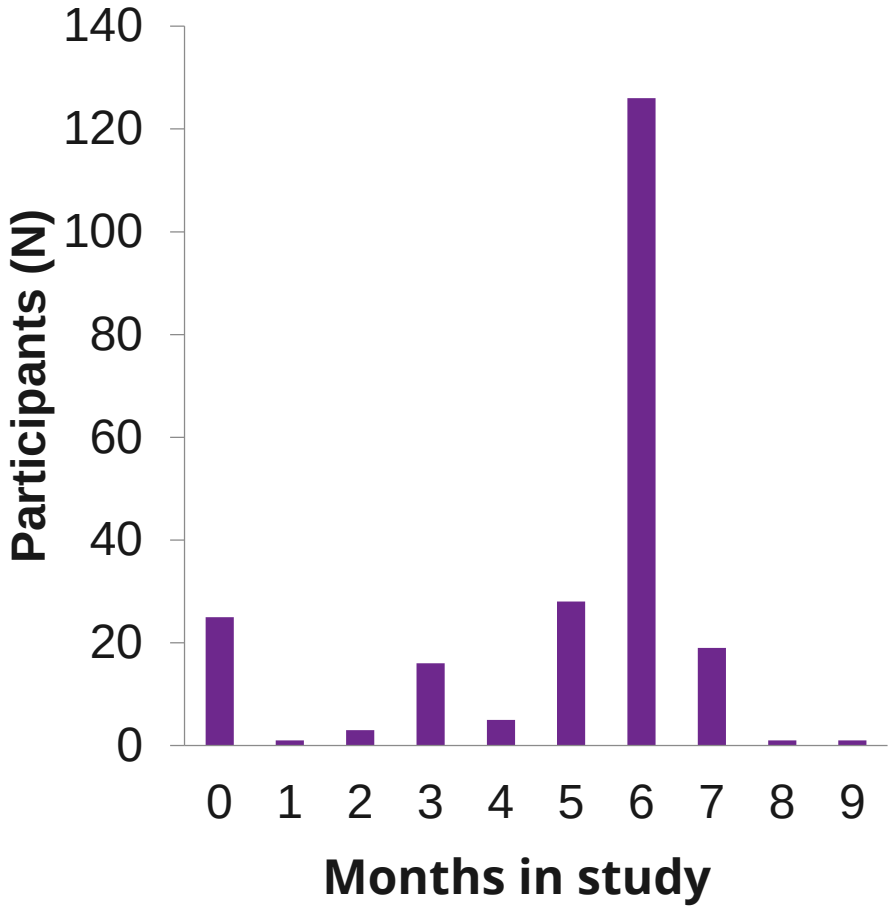
Characteristic	CATCH participants (n=223) N (%)	Comparison group (n=168) N (%)	P
Baseline mental health symptom severity (CSI)			
Mean, 95% confidence interval[4]	42.0 (40.4, 43.5)	41.1 (39.3, 42.9)	0.45
Has 3 or more chronic health conditions	117 (52.5)	104 (61.9)	0.06

[4]Because of high proportion of missing data, calculated after multiple imputation.



Program and Study Participation





Pre-post analyses

Adjusted changes from baseline to 3- and 6- months for CATCH participant outcomes

	3 months versus baseline		6 months versus baseline	
Outcome	**Mean difference (95% CI)**	**P**	**Mean difference (95% CI)**	**P**
Physical component score (SF36-PCS)	0.73 (0.002 to 1.5)	0.049	1.5 (0.004 to 2.9)	0.049
Mental component scores (SF36-MCS)	3.5 (2.4 to 4.7)	<0.0001	7.1 (4.8 to 9.4)	<0.0001
Mental health symptoms (CSI)	-	-	-7.3 (-9.0 to -5.7)	<0.0001
Quality of life (QOLI20 total score)	-	-	10.4 (6.8 to 13.9)	<0.0001
Alcohol component (ASI)	-	-	-0.045 (-0.070 to -0.020)	0.0005
Drug component (ASI)	-	-	-0.029 (-0.041 to -0.017)	<0.001
	Rate ratio (95% CI)	**P**	**Rate ratio (95% CI)**	**P**
Number of hospital admissions in past 3 months	0.72 (0.55 to 0.96)	0.025	0.61 (0.43 to 0.87)	0.006
Number of ED Visits in past 3 months	0.97 (0.75 to 1.26)	0.816	0.77 (0.55 to 1.08)	0.131
Number of days homeless in past 3 months	1.04 (0.93 to 1.18)	0.469	0.96 (0.83 to 1.11)	0.594

[1] Mean values correspond to the adjusted monthly change from baseline (slope), whereas the rate ratios correspond to the estimated rate of events in the past 3 months at each time point divided by the rate of events in the past 3 months at baseline. Model results are based on data generated by multiple imputation.

[2] Higher values are associated with better outcomes for SF36-PCS, SF36-MCS and QOLI-20 total score, and with poorer outcomes for the ASI and the CSI.

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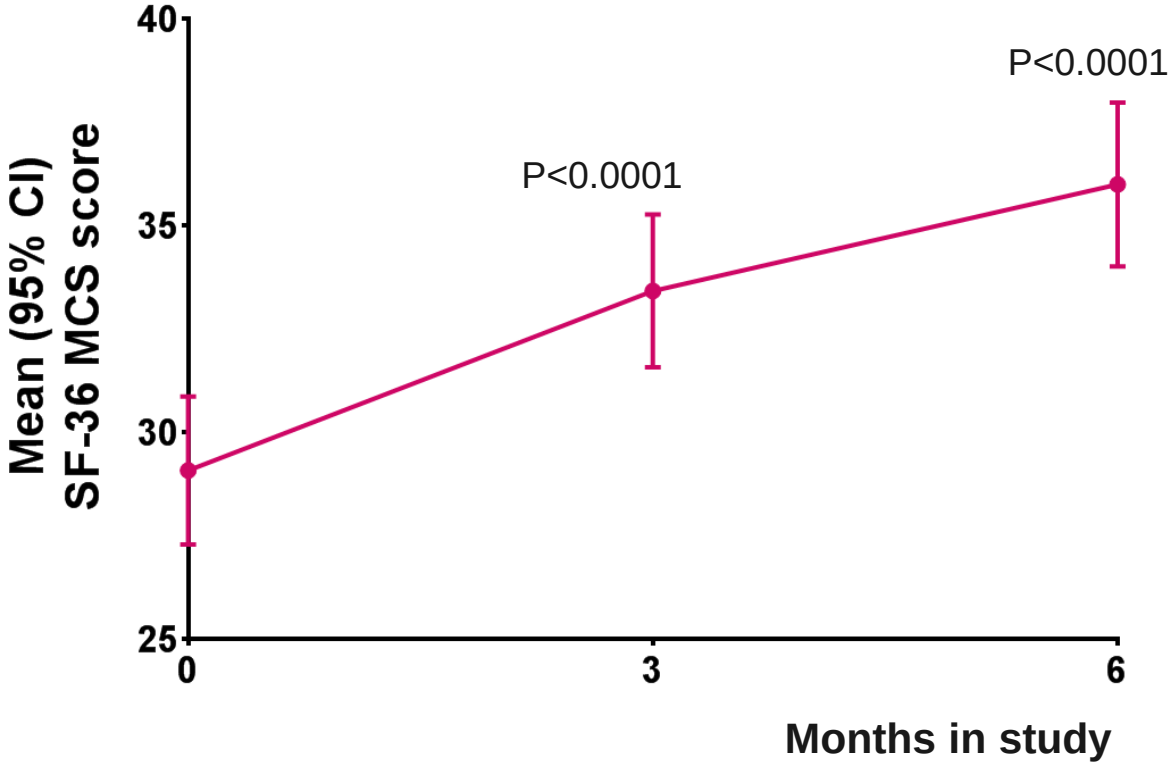
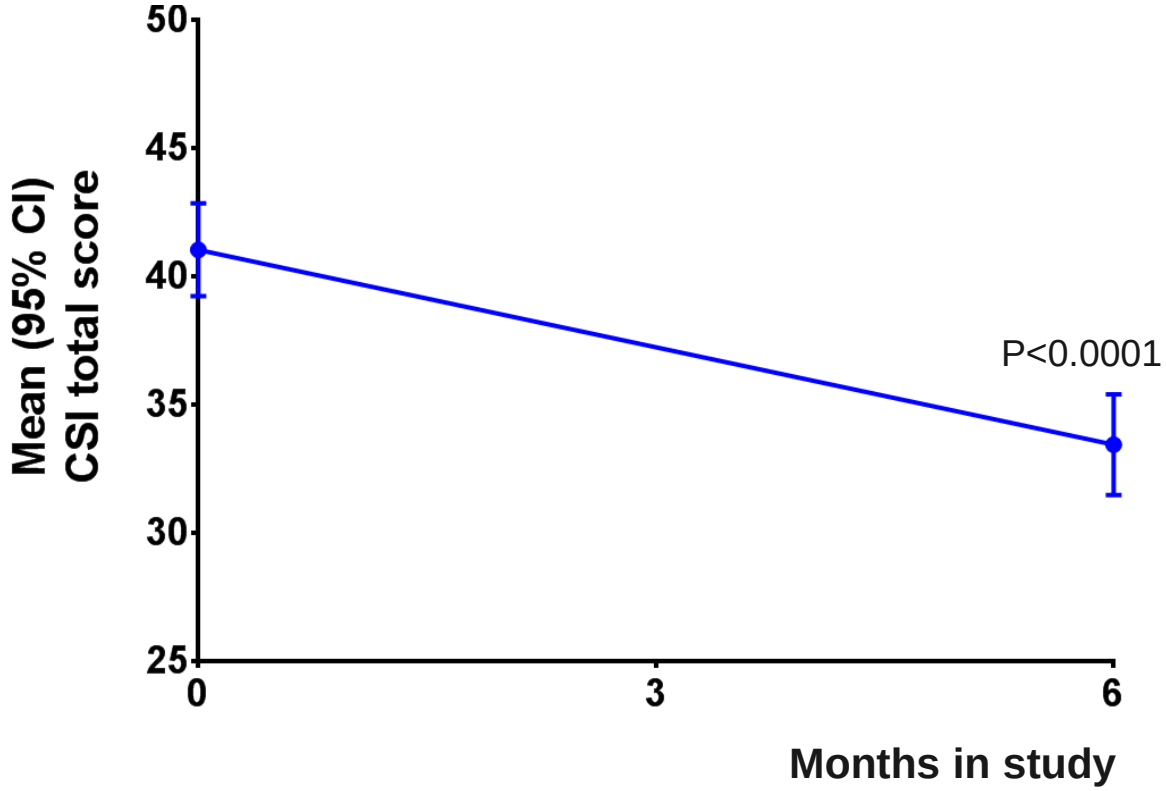
Mental Health Status

SF-36 Mental Component Score (MCS)



CSI Total Score



SF-36 PCS also increased significantly (p=.049)

Post-hoc Analyses

Comparison of outcomes at 6 months among CATCH participants with a comparison group of homeless adults with mental illness who had access to usual care

Outcomes	Mean difference at 6 months (95% CI)	P-value
Physical component score (SF12 PCS)	0.59 (-1.93 to 3.10)	0.648
Mental component scores (SF12 MCS)	1.04 (-2.13 to 4.21)	0.519
Mental health symptoms (CSI)	-2.50 (-4.84 to -0.16)	0.036
Quality of life (QOLI20 total score)	-0.19 (-4.81 to 4.44)	0.936
	Rate Ratio (95% CI)	**P-value**
Number of days in hospital in past 6 months	5.79 (2.87 to 11.70)	<0.0001
Number of days in stable housing in past 6 months	0.92 (0.43 to 1.97)	0.839
Number of ED Visits in past 6 months	2.14 (1.41 to 3.25)	0.0004
Number of days with alcohol problems in past month	0.43 (0.19 to 0.99)	0.047
Number of days with drug problems in past month	0.21 (0.09 to 0.52)	0.0007

[1]Model results based on data generated by multiple imputation

Summary of Quantitative Results

- CATCH resulted in significantly improvements in health status, as evidenced by improvement in SF-36 PCS and MCS scores and reduction in negative symptoms measured by CSI scores
- CATCH participants reported significantly improved quality of life after 6 months
- The expected number of admission decreased by 28% from baseline to 3 months and by 39% at 6 months but the rate of ED use did not decrease significantly from baseline to either follow-up visit
- The monthly rate of days spent homeless also did not improve from baseline to either study visit
- Working Alliance with CATCH case managers was significantly associated with improvements in mental health and decreased number of hospital admissions
- CATCH participants, compared to a usual care group, had significant reductions in mental health symptom severity and the number of days with alcohol and drug problems in the past month.

Qualitative findings

Study participants across stakeholder groups identified several key themes relating to experiences of continuity of care:

1. *Promoting and facilitating low-barrier access to services*
2. *Offering timely services*
3. *Supporting early and sustained engagement*
4. *Coordinating a multitude of services*
5. *The service landscape*

Low-barrier access to care

- Service location was a key facilitator; participants appreciated that the clinic was close to other services and easily accessible by public transit
- Appointment escorts (peer support workers or case managers) were an important source of practical and emotional support for participants, in addition to facilitating attendance

"I needed somebody just to start me off going to appointments, and I was feeling weak and worried and anxious, so [CM] hooked me up a couple of times with that." *(service user 22)*

Timeliness of services

- Services were available through both scheduled appointments and drop-in clinic times. Participants highly valued the highly novel experience of timely service connections.

- Timely connection to services alleviated service user stress and quick results sustained hopefulness and
  motivation to remain engaged in the health seeking process

"Well, what I did [when unable to access a needed service fast enough], ***was I ended up getting depressed, frustrated and started using.***

It's almost like a brick wall's in front of you and you can't knock it down…it was just hard to get through to get people." (*service user 3)*

Individualized and engaging care

- Attending to individual service user needs, maintaining frequent contact, and offering knowledgeable and welcoming services were critical to building confidence, trust and supporting continuity of care

- All stakeholders agreed that service providers' welcoming and respectful approach is essential in facilitating early and sustained engagement and care continuity

"Everyone here has a good knowledge of homeless issues. Like, the short-term and long-term issues that affect our service users. So, it's very specialized and that's an important piece…we create a comfortable environment, so service users feel comfortable, at ease. They develop quick, easy rapport with us." *(CATCH staff member)*

Service navigation and coordination

- Service users highly valued navigation of the service system and coordination of services provided by the case managers.

- Service providers communicated frequently, working well individually and as a team to identify pre-existing providers, streamline services, and organize care from across specialties and sectors

- Service coordination was facilitated by shared emphasis on flexible service provision

"We have more of a voice than if a client calls themselves…we know the system." *(CATCH staff member)*

Service landscape

- Overarching service system constraints and scare resources limited the comprehensiveness of immediate as well as long-term services available. Limited accessibility of psychiatrists and housing are particular barriers.

- System fragmentation and service silos led to a preference to refer to “one-stop-shops”

“When the housing stock is not there, and when rent is going through the roof every year, it is just almost impossible…

The societal difficulties are really very tough. So, we try to do our best, but the problems are still there.”

(partner organization manager)

Summary of Qualitative Results

- Brief interventions can promote continuity of care through low-barrier designs that are relationship-based and aim to meet participants where they're at.

- Timely service provision, intentional and individualized engagement, and support in system navigation and service coordination are essential to the experience of hopefulness and continuity of care.

- Systemic barriers of constrained resources and fragmentation are significant challenges, and multi-service agencies may help to mitigate.

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Discussion

Conclusions

- Brief, community based multidisciplinary interventions may be a promising approach to improving health outcomes and continuity of care for homeless people with unmet health needs following discharge form hospital

- Both quantitative and qualitative data highlight that a strong positive relationship between service users and providers is associated with improved outcomes and experiences of care

- Qualitative work highlights the importance of offering accessible, individualized and welcoming services; and the importance of the broader service landscape, and key additional services needed by homeless people, including affordable housing and accessible mental health services.

Limitations

- Non-randomized trial design limits causal inference
- Significant sample differences at baseline in comparison group participants, including in past service use
- Short follow-up duration; studies of CTI following discharge have been shown to improve housing outcomes over 18-months of follow-up[8,10]

Acknowledgements: Research Team

Principal Investigator

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Co-Investigators

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References

1. Khandor E, Mason K. The Street Health Report 2007
2. Lewis S. A System in Name Only — Access, Variation, and Reform in Canada's Provinces. N Engl J Med 2015;372(6):497-500
3. Hwang SW. Homelessness and health. CMAJ 2001;164(2):229-33.
4. Fazel S, Geddes JR, Kushel M. The health of homeless people in high-income countries: descriptive epidemiology, health consequences, and clinical and policy recommendations. The Lancet 2014;384(9953):1529-1540.
5. Salize HJ, Werner A, Jacke CO. Service provision for mentally disordered homeless people. Curr Opin Psychiatry 2013;26(4):355-61
6. Zerger S, Bacon S, Corneau S, Skosireva A, McKenzie K, Gapka S, P OC, Sarang A, Stergiopoulos V. Differential experiences of discrimination among ethnoracially diverse persons experiencing mental illness and homelessness. BMC Psychiatry 2014;14(1):353.
7. Skosireva A, O'Campo P, Zerger S, Chambers C, Gapka S, Stergiopoulos V. Different faces of discrimination: perceived discrimination among homeless adults with mental illness in healthcare settings. BMC Health Serv Res 14:376.
8. Susser E, Valencia E, Conover S, Felix A, Tsai WY, Wyatt RJ. Preventing recurrent homelessness among mentally ill men: a "critical time" intervention after discharge from a shelter. Am J Public Health 1997;87(2):256-262.
9. Jones K, Colson PW, Holter MC, Lin S, Valencia E, Susser E, Wyatt RJ. Cost-effectiveness of critical time intervention to reduce homelessness among persons with mental illness. Psychiatr Serv 2003;54(6):884-90.
10. Herman DB, Conover S, Gorroochurn P, Hinterland K, Hoepner L, Susser ES. Randomized trial of critical time intervention to prevent homelessness after hospital discharge. Psychiatr Serv 2011;62(7):713-9.
11. Kasprow WJ, Rosenheck RA. Outcomes of critical time intervention case management of homeless veterans after psychiatric hospitalization. Psychiatr Serv 2007;58(7):929-935.
12. Shinn M, Samuels J, Fischer SN, Thompkins A, Fowler PJ. Longitudinal impact of a family critical time intervention on children in high-risk families experiencing homelessness: a randomized trial. Am J Community Psychol 2015;56(3-4):205-116.
13. Herman DB, Opler L, Felix A, Valencia E, Wyatt RJ, Susser E. A critical time intervention with mentally ill homeless men: impact on psychiatric symptoms. J Nerv Ment Dis 2000;188(3):135-40.
14. de Vet R, Beijerbergen MD, Jonker IE, Lake DAM, van Hemert AM, Herman DB, Wolf JRLM. Critical time intervention for homeless people making the transition to community living: a randomized controlled trial. Am J Community Psychol 2017;60(1-2):175-186.
15. Tomita A, Herman DB. The impact of critical time intervention in reducing psychiatric rehospitalization after hospital discharge. Psychiatr Services 2012;63(9):935-7.
16. Fortney J, Sullivan G, Williams K, Jackson C, Morton SC, Koegel P. Measuring continuity of care for clients of public mental health systems. Health Serv Res 2003;38(4):1157-1175.
17. Tomita A, Herman DB. The role of a critical time intervention on the experience of continuity of care among persons with severe mental illness after hospital discharge. J Nerv Ment Dis 2015;203(1):65-70.
18. Haggerty JL, Reid RJ, Freeman GK, Starfield BH, Adair CE, McKendry R. Continuity of care: a multidisciplinary review. BMJ 2003;327(7425):1219-21.
19. Stergiopoulos V, Gozdzik A, Nisenbaum R, Lamanna D, Hwang SW, Tepper J, Wasylenki D. Integrating Hospital and Community Care for Homeless People with Unmet Mental Health Needs: Program Rationale, Study Protocol and Sample Description of a Brief Multidisciplinary Case Management Intervention. Int J Ment Health Addict 2017:1-17.

Thank You

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