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Strengthening health literacy among urban marginalised populations through a tailored primary care model: a mixed-methods study

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Abstract

Background Urban marginalised populations face intersecting barriers, such as poverty, unstable housing and discrimination, that erode health literacy in primary-care contexts. We examined whether an inter-professional, low-barrier primary care model improves health literacy competencies compared with usual care.

Methods A convergent mixed-methods study took place at Centretown Community Health Centre (CCHC), Ottawa (2019–2023). Phase 1 compared Health Literacy Questionnaire (HLQ) scores between clients receiving tailored care ($n=37$) and matched community members using usual services ($n=36$). Phase 2 explored experiences through four focus groups and semi-structured interviews ($n=23$). Independent samples t-tests and inductive thematic analysis were used.

Results Overall health literacy was moderate in both groups; however, the tailored-care group scored higher on *appraisal of health information* ($M=3.03\pm0.57$ vs. 2.76 ± 0.46, $p=0.025$, $d=0.53$). Qualitatively, tailored-care participants described clearer chronic-disease self-management, strategic navigation of appointments, and fewer inappropriate emergency department visits. Persistently low *social support* scores highlighted systemic isolation.

Conclusions Embedding social supports, outreach, and client-centred education within primary care can strengthen critical appraisal skills in marginalised settings. Scaling such models should pair literacy interventions with broader community-support strategies.

Trial registration Not applicable (observational study).

Keywords Health literacy, Tailored primary care, Marginalised populations, Community health centre, Canada

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Background

Health literacy is a fundamental determinant of health, shaping individuals' ability to make informed decisions and navigate healthcare systems effectively [1]. The World Health Organization (WHO) defines it as the ability to "gain access to, understand, and use information in ways which promote and maintain good health" [2]. Global health policies increasingly recognize it as essential to improving health outcomes and advancing equity [3, 4].

Health literacy extends beyond basic reading skills to include the ability to evaluate and apply health information. It plays a critical role in service navigation, shared decision-making, and chronic disease management [1, 2]. Low health literacy is associated with increased hospitalizations, lower preventive care use, poor treatment adherence, and higher healthcare costs which often exceeds the impact of age, education, or income [5, 6]. By contrast, strong health literacy empowers individuals and communities to manage their health and address broader social and environmental determinants [7].

The WHO Shanghai Declaration (2017) [2] emphasizes health literacy as a shared responsibility across health systems, governments, educators, and communities. The integrated model of health literacy [8] reinforces that it develops over the life course and is shaped by education, economic stability, social support, and system design. It is linked to service utilization, patient engagement, and overall system sustainability [9]. Ideally, health literacy equips individuals to access trustworthy information, collaborate with providers, and improve personal and community well-being [10].

Urban marginalized populations and health literacy

Urban marginalized populations face persistent barriers to healthcare rooted in systemic discrimination and social, economic, and political inequalities [11]. These groups include people experiencing homelessness, addiction, mental illness, incarceration histories, street-involved youth, Indigenous peoples, and racialized minorities, including immigrants and refugees [12]. Social determinants such as poverty, housing instability, exclusion, and limited access to basic resources further drive health inequities and poor outcomes [12].

Despite high health needs, many encounter ongoing challenges accessing care. Mistrust, stigma, and discrimination intersect with logistical obstacles like lack of permanent housing, ID, transportation, or social support [12, 13]. These factors limit engagement with primary care and complicate system navigation. Equitable care demands that providers and systems address these intersecting structural barriers [14]. Barriers are not only system-based but also shaped by individuals' capacity to perceive, seek, and engage with services [15].

Low health literacy is both a result of and contributor to these dynamics. Individuals in marginalized settings often report limited ability to navigate appointments, engage in care decisions, or understand prescriptions [6]. This contributes to delayed diagnoses, preventable hospitalizations, poor chronic disease management, and frequent emergency department use [16, 17]. Health literacy also influences daily self-care, medication adherence, and chronic condition management [7]. Provider unawareness of patients' literacy levels can further strain communication and reduce care quality [6].

Addressing these challenges requires integrated, team-based primary care models tailored to marginalized populations. Evidence increasingly supports interprofessional, client-centered approaches that align care with patients' lived realities and reduce barriers to access [13, 14, 18].

Tailored primary health care for urban marginalized populations

Tailored primary health care (PHC) models are increasingly recognized as essential for addressing the complex health needs and systemic barriers faced by urban marginalized populations [13, 18]. These models offer integrated, person-centered care that targets the social determinants of health and seeks to reduce inequities in access and outcomes; especially for individuals experiencing poverty, housing instability, trauma, or social exclusion. These challenges are often compounded by unfamiliarity with the Canadian health system, contributing to low health literacy and poorer health outcomes.

One such model, implemented at Centretown Community Health Centre (CCHC) in Ottawa, Canada, exemplifies this approach. Located in a diverse urban neighborhood with large shelters and rooming houses, CCHC's tailored PHC model serves clients experiencing homelessness, mental illness, substance use, or prior incarceration, and refugee claimants. Many have engaged with health systems outside Canada and face additional barriers, including language difficulties, unfamiliar protocols, and limited access to health coverage.

Over the past 25 years, the model has evolved into a comprehensive, interprofessional urban health program that brings together primary care providers, nurses, case managers, social and community health workers, mental health professionals, and harm reduction specialists. It offers both walk-in and scheduled services, mental health care, and outreach delivered directly to shelters, rooming houses, rough sleep sites, and drop-ins. The model also partners with hospitals to bring specialized services into the community, for example, fibro scans for hepatitis C monitoring, pediatric, and psychiatric consultation. During the COVID-19 pandemic, mobile phones were distributed to clients to ensure continued access to care and follow-up during a period of heightened isolation and disruption.

A recent evaluation by Khorsand et al. [19] found that the model effectively engages clients often underserved by conventional primary care services. Over a one-year period, the program served 570 unique clients and recorded 1,859 total visits (mean 3.26, SD 4.10) [19]. Its low-barrier, trust-building approach, grounded in a deep understanding of the social determinants of health, was found to be a key contributor to its success, making the model directly relevant to clinicians and decision-makers in primary care settings. By embedding social support, outreach, mental health, and harm reduction within a tailored primary care model, the team reduces barriers and fosters sustained engagement.

To address low health literacy, the care team provides practical, client-centered supports such as maps to pharmacies and community services, assistance with reading prescription labels and refilling medications, and preparation for lab visits, including explanations of required forms and the purpose of tests. Clients are also supported in understanding the importance of attending specialist appointments, with efforts made to identify and address barriers to follow-through. Clients receive transportation assistance such as taxi chits or bus fare and are given appointment reminders, often through calls or texts depending on their preference and accessibility. The team also sits with clients to review and simplify instructions for upcoming procedures (e.g., abdominal or gynecological ultrasounds, colonoscopy prep) and, when needed, accompanies them to appointments.

Disease-specific education is provided, including support for diabetes self-management, such as understanding diet, blood sugar levels, medication use, and glucose monitoring. To facilitate access, a diabetes educator is embedded within walk-in clinics, offering on-the-spot support without the need for separate referrals or appointments. The team also helps clients develop comfort with essential communication tools, including how to use mobile phones and access voicemail, which are crucial for receiving follow-ups and health information. Community health workers further assist with navigating the broader system, supporting access to housing, physiotherapy, optometry, and dental care, while building clients' confidence and skills to manage their care more independently. Clients may book appointments by phone, text, or in person, and same-day walk-in slots are reserved daily for unsheltered individuals.

Study objectives

Building on the above context, this study sought to evaluate the impact of comprehensive primary care tailored to urban marginalized populations, such as those offered by the CCHC, on the health literacy of this populations. By assessing healthcare literacy and exploring the challenges these populations face, the study aimed to determine the effectiveness of tailored primary care in fostering better health literacy and self-management.

Methods

This study employed a mixed methods design to explore healthcare literacy among marginalized urban and complex populations. The approach integrated quantitative (phase 1) and qualitative (phase 2) methodologies to provide a comprehensive understanding of healthcare literacy and its determinants. The quantitative arm used the Health Literacy Questionnaire (HLQ) to compare domain scores between clients receiving tailored primary care and a care –as usual group. The qualitative arm comprised semi-structured interviews and focus groups with purposive sampling to capture diverse system navigation and learning experiences. Findings were integrated at the interpretation stage to explain quantitative patterns and inform implications for service delivery.

Participants

Participants were recruited using defined inclusion and exclusion criteria to enable meaningful comparisons between two groups within the same service area. Recruitment processes and sample flow for both phases are summarised in Fig. 1.

Two health-centre clients (one English-speaking, one Francophone) reviewed the study protocol, information sheet, and interview guide to ensure clarity and cultural safety, suggesting plain-language revisions, removing potentially stigmatizing phrasing, clarifying voluntariness and confidentiality, and recommending flexible participation options (e.g., preferred location or format). The study focused on individuals from urban marginalized populations, including those experiencing homelessness or housing instability, poverty, substance use, mental illness, or systemic marginalization. A distinct subgroup of new immigrants and refugees was also included due to their overlapping challenges and unique barriers to care, such as language difficulties, unfamiliarity with Canadian health and social systems, and difficulty navigating bureaucratic structures. Although newcomers and refugees were purposively included, their specific representation cannot be reported because newcomer/refugee status was not collected as a separate variable. To be eligible, participants had to access services in the CCHC catchment area, identify with one or more of the defined populations, be able to converse in English or French, and provide written informed consent.

Participants were enrolled into one of two groups:

- Tailored primary care group: Individuals actively receiving or who had previously received services

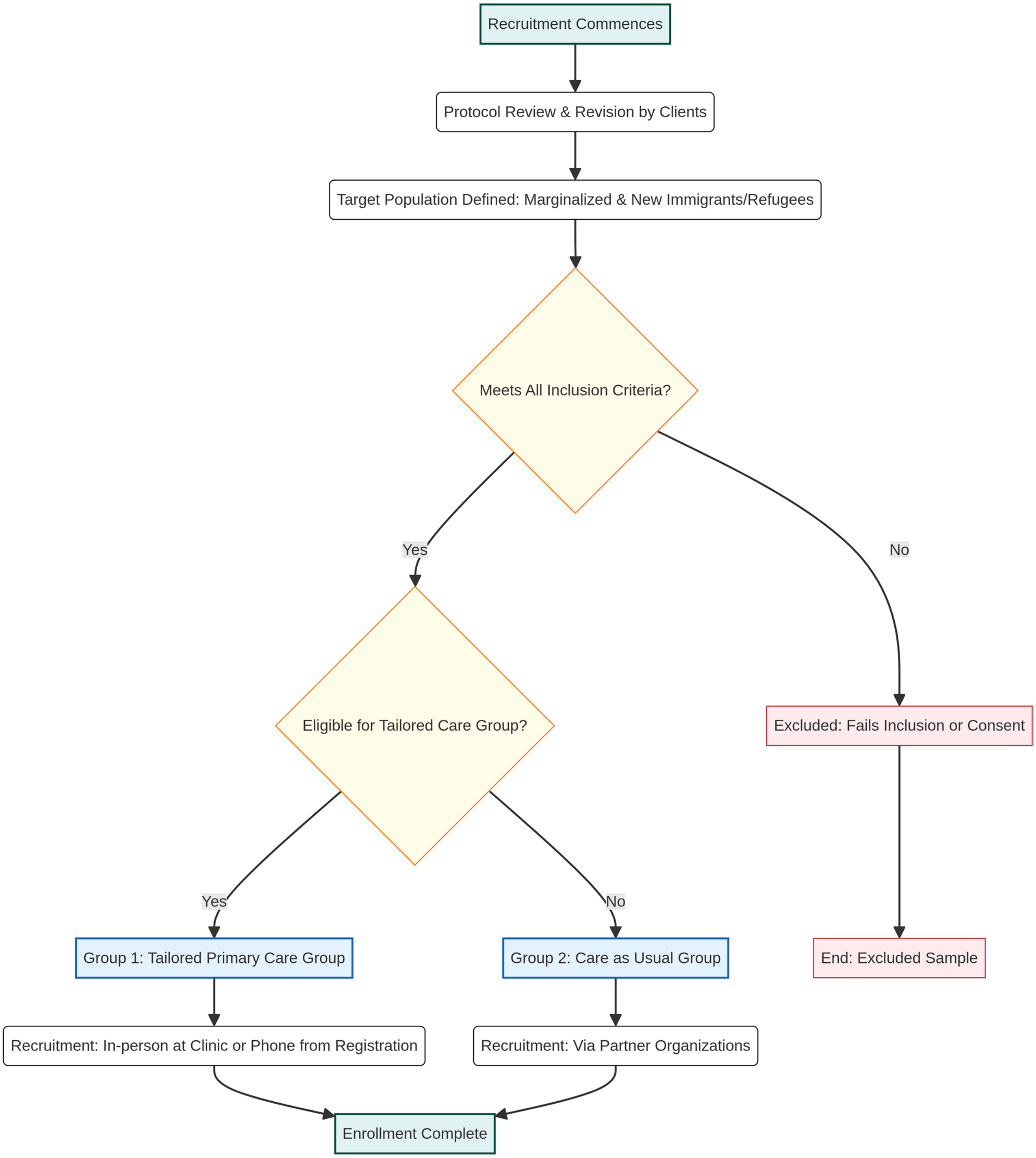

Fig. 1 Recruitment flow diagram for the tailored care and care-as-usualgroups

through CCHC's tailored primary care model., "Active" and "previous" engagement were not treated as separate analytic groups; rather, both terms reflect the fluctuating nature of care engagement in low-barrier settings. Participants were eligible if they had at least one documented encounter with the tailored primary care model within the past three to five years, regardless of whether they were currently accessing services at the time of recruitment. Recruitment took place in person at the outreach program clinic or by phone, using contact details provided at registration.

- Care as usual group: Individuals from the same geographic area who received healthcare services

> elsewhere, not through the CCHC tailored model. Recruitment was conducted through partner organizations such as homeless youth shelters, women's shelters, family shelters, drop-in centres, and community meal programs.

Exclusion criteria included inability to provide written informed consent or failure to meet the outlined inclusion criteria. A complete, phase- and group-specific list of inclusion and exclusion criteria is provided in Supplementary file 5 (Inclusion and exclusion criteria). This recruitment strategy supported a comparative analysis of health literacy between individuals engaged with the tailored model and those receiving usual care within the same local context.

Ethics

Institutional review board approval for both phases of the study was obtained from the Ottawa Health Science Network Research Ethics Board (20190011–01 H) on October 21, 2019. Participants who completed the HLQ questionnaire in Phase 1 or in a 60-minute focus group in Phase 2 received $30 CAD participant stipends.

Phase 1: Quantitative arm

Phase 1 utilized a survey-based approach to assess health literacy among marginalized urban populations.

Measures

Demographics questionnaire

Participant socio-demographic characteristics were collected via a structured questionnaire developed for this study (see supplementary file 1). The questionnaire solicited information on age, sex, education level, occupation, long-standing illnesses or disabilities, possession of private health insurance or a healthcare card, and visits to a hospital emergency department in the past 12 months for an illness. Table 1 summarizes statistics of socio-demographic characteristics.

Health Literacy Questionnaire (HLQ)

Health literacy was assessed using the Health Literacy Questionnaire (HLQ) [5], a validated tool measuring nine key domains of health literacy. These domains include (1) Feeling understood and supported by healthcare workers, (2) Having sufficient information to manage health, (3) Actively managing one's health, (4) Social support for health, (5) Appraisal of health information, (6) Ability to actively engage with healthcare providers, (7) Navigating the healthcare system, (8) Finding good health information, and (9) Understanding health information well enough to know what to do. These domains address essential aspects of health literacy, including relational support, self-management, social networks, and system navigation. The HLQ employs Likert-type response options, with each domain comprising 4–6 items. The HLQ is grounded in the WHO definition of health literacy and was developed and validated using extensive patient engagement [5, 20]. We selected the HLQ because its nine scales align with our objective to characterise competencies beyond functional reading or numeracy. In addition, the HLQ was preferable to functional tools given its focus on navigation, relational engagement, and critical appraisal.

The HLQ was administered in participants' preferred language (English or French).

Procedure

Participants in the tailored primary care group (*n* = 37) were selected via simple random sampling from individuals awaiting services at the community health center. Participants in the care as usual group (*n* = 35) were recruited using venue-based convenience sampling through partner organizations (e.g., shelters, drop-in centers, and newcomer health clinics) within the centre's service area.

All participants completed a self-reported demographics questionnaire and the Health Literacy Questionnaire (HLQ), taking approximately 20 min in total. To accommodate language differences, all recruitment and consent materials, as well as the HLQ, were available in English and French, and participants completed the survey in their preferred language. A research team member was present during survey completion to offer clarification and support, ensuring full participant engagement.

Data analysis

The Health Literacy Questionnaire (HLQ) was scored using the algorithm developed by Osborn et al. [5]. This algorithm calculates unweighted scores for each of the nine scales of the HLQ. Final scores for each of the nine scales is calculated by averaging the score to the items that comprise that scale. HLQ scores within a scale reflect an individual's strengths and areas of growth within a health literacy context.

Independent samples t-tests were conducted comparing scores between the CCHC and care as usual groups for each of the nine scales. No outliers were identified in the sample. Normality was assessed using the Shapiro–Wilk test, and distributions for most scales were approximately normal ($p > 0.05$). Equality of variances was examined using the Brown–Forsythe test, with Welch's adjustment applied when variances were unequal. As analyses focused on HLQ domain scores rather than categorical subgroup comparisons, no additional tests for categorical variables were required.

Table 1 HLQ participant demographics

	Tailored primary care (*n* = 36)				**Care as usual (*n* = 37)**			
	%	**M**	**SD**	**Range**	**%**	**M**	**SD**	**Range**
Age		44.2	13.8	18–76		38.1	17.3	15–71
Sex								
Male	61.1				54.1			
Female	38.9				45.9			
Living								
Alone	77.8				66.7			
With others	22.2				33.3			
Language								
English	61.1				75.7			
Other	38.9				24.3			
Education								
Primary school or less	0				8.1			
High school (not completed)	41.7				21.6			
High school (completed)	22.2				35.1			
TAFE/Trade	11.1				13.5			
University (Undergraduate degree/s completed)	19.4				16.2			
University (Postgraduate degree/s completed)	5.6				5.4			
Employment								
Working full-time	19.4				2.7			
Working part-time	2.8				2.7			
Home duties	0				13.5			
Full-time student	2.8				10.8			
Part-time student	0				5.4			
Retired	2.8				8.1			
Permanently unable to work/ ill	44.4				35.1			
Other	27.8				21.6			
Illness								
Physical illness	25.0				29.7			
Physical and mental illness	44.4				51.4			
Mental illness	13.9				2.7			
None	16.7				16.2			
Number of comorbidities		3.4	2.0	1–9		2.7	1.8	1–9
Private health insurance								
Yes	2.8				5.6			
No	97.2				94.4			
Health card								
Yes	72.2				91.9			
No	27.8				8.1			
Visited emergency in past 12 months								
Yes	41.7				43.2			
No	58.3				56.8			

N = 73

Phase 2: Qualitative arm

Four focus groups were initially planned to complement phase 1 of the study by exploring participants' health literacy, experiences with healthcare services, and interactions with the healthcare system. The discussions centered on health literacy, with participants reflecting on both positive and negative experiences related to accessing primary, specialist, emergency, and tertiary care. Sessions were audio-recorded and supplemented with detailed notes for comprehensive analysis.

Recruitment

Recruitment challenges included participant availability, competing priorities, and hesitancy to engage in group discussions. To enhance participation, we implemented a flexible approach, offering both virtual and in-person focus groups and conducting individual interviews for those unable to attend group discussions. This ensured representation across both participant groups.

Data collection and analysis

Focus groups and interviews were moderated by CL (PhD candidate, community psychologist) and SK (MPH, qualitative researcher), both with prior experience in community health; they kept reflexive field notes to bracket assumptions throughout data collection. Each focus groups and individual semi-structured interviews last approximately 60 min and followed topic guides developed by the research team (see supplementary files 2–4). Sessions were audio-recorded, transcribed verbatim, and de-identified.

For analysis, two qualitative researchers (SH, MK) independently coded 20% of transcripts to develop an initial codebook, which was refined through pilot testing on additional transcripts. They then independently coded the remaining data using the revised codebook, resolving discrepancies through biweekly team discussions.

An inductive thematic analysis [21] was used to identify themes related to healthcare utilization and health literacy. Themes were compared across the tailored primary care and care as usual groups and refined iteratively to reflect meaningful patterns in the data.

To ensure rigor, the research team held biweekly debriefing meetings and emphasized rich, detailed descriptions of participant experiences [22].

Results

Quantitative arm

We conducted nine independent samples t-tests comparing HLQ scores across the tailored primary care and care as usual groups (Table 2). Internal consistency estimates were evaluated across the nine scales, yielding high reliability ($\alpha = 0.84$, 95% CI=[0.785–0.892]). Eight out of the nine scales showed no statistically significant differences between groups, suggesting comparable health literacy among individuals receiving services through tailored primary care and those accessing care as usual. However, individuals receiving services through a tailored primary care ($M = 3.032$, $SD = 0.573$) demonstrated significantly greater appraisal of health information than those receiving care as usual ($M = 2.575$, $SD = 0.455$, $t(72) = 2.293$, $p = 0.025$, $d = 0.533$, 95% CI=[0.067, 0.995]).

The appraisal of health information subscale captures how well individuals are able to critically assess health-related information, such as identifying trustworthy sources, recognizing misinformation, and resolving conflicting advice. A higher score in this domain reflects greater confidence in evaluating, verifying, and applying health information to make informed decisions. The significant difference observed in this domain indicates a higher level of confidence in evaluating and applying health information among participants in the tailored primary care group.

While other HLQ subscales did not show statistically significant differences, two demonstrated moderate effect sizes despite non-significant p-values: "Having sufficient information to manage health" ($d = 0.448$) and "Understanding health information well enough to know what to do" ($d = -0.423$). These patterns may reflect meaningful differences that could be explored further in larger or longitudinal studies.

The highest mean scores were observed in the domain "Ability to actively engage with healthcare providers" (EA) ($M = 4.146$, $SD = 0.834$ and $M = 3.897$, $SD = 0.699$), indicating strong engagement abilities in both groups. The lowest scores were seen in "Social support for health" (SS) ($M = 2.914$, $SD = 0.708$ and $M = 2.805$, $SD = 0.561$), suggesting limited perceived social support in managing health across both groups.

Qualitative arm

Seven participants who received tailored primary care and sixteen participants who received care as usual participated in a focus groups or interviews. Focus groups

Table 2 Health literacy questionnaire (HLQ) scores across CCHC and treatment-as-care as usual groups

HLQ Subscales	Tailored primary care		Care as usual		t(42)	*p*	d
	M	SD	M	SD			
HPS	3.264	0.637	3.081	0.595	1.273	0.207	0.296
HSI	3.182	0.516	2.946	0.540	1.925	0.058	0.448
AMH	3.146	0.627	2.935	0.512	1.585	0.117	0.368
SS	2.914	0.708	2.805	0.561	0.728	0.469	0.169
CA	3.032	0.573	2.757	0.455	2.293*	0.025	0.533
EA	4.146	0.834	3.897	0.699	1.391	0.169	0.323
NHS	3.716	0.836	3.676	0.755	0.216	0.830	0.050
FHI	3.638	0.824	3.870	0.717	-1.294	0.200	-0.301
UHI	3.697	1.090	4.086	0.710	-1.820	0.073	-0.423

HSP = Feeling understood and supported by healthcare workers, HSI = Having sufficient information to manage health, AMH = Actively managing one's health, SS = Social support for health, CA = Appraisal of health information, EA = Ability to actively engage with healthcare providers, NHS = Navigating the healthcare system, FHI = Finding good health information, UHI = Understanding health information well enough to know what to do, * indicates statistical significance and interviews were conducted between November 12, 2021, to September 11, 2023. Participant demographics are presented in Table 3.

Two overarching themes emerged (Fig. 2). The first theme encompassed the process of healthcare system navigation, which included subthemes of: (i) trial and error, and (ii) reaching an understanding of the health system and how to navigate it. Our second theme pertained to the inappropriate use of the healthcare system and emergency services. This second theme in cluded two sub-themes: (i) health literacy being inappropriate for their current care context, and (ii) using health literacy to get access to care.

Theme 1: process of healthcare system navigation. According to participants' reports, healthcare system navigation was inextricably linked to health literacy. The process of learning and eventually understanding

Table 3 Focus group and interview demographics

	Tailored primary care(*n* = 7)				Care as usual (*n* = 16)			
	%	**M**	**SD**	**Range**	**%**	**M**	**SD**	**Range**
Age		49.9	11.5	35–65		46.1	14.1	28–70
Sex								
Male	57.1				81.3			
Female	42.9				12.5			
Living								
Alone	71.4				18.8			
With others	14.3				68.8			
Language								
English	57.1				100			
Other	42.9				0			
Education								
Primary school or less	0				6.67			
High school (not completed)	14.3				0			
High school (completed)	14.3				26.7			
TAFE/Trade	0				13.3			
University (Undergraduate degree/s completed)	57.1				6.67			
University (Postgraduate degree/s completed)	14.3				46.7			
Employment								
Working full-time	42.9				33.3			
Working part-time	14.3				6.67			
Home duties	0				13.3			
Full-time student	0				0			
Part-time student	0				0			
Retired	14.3				13.3			
Permanently unable to work/ ill	28.6				20.0			
Other								
Illness								
Physical illness	50.0				20.0			
Physical and mental illness	0				33.3			
Mental illness	50.0				6.67			
None	0				33.3			
Other	0				6.67			
Number of comorbidities				–				–
Private health insurance								
Yes	16.7				26.7			
No	83.3				73.3			
Health card								
Yes	100				85.7			
No	0				14.3			
Visited emergency in past 12 months								
Yes	50.0				66.7			
No	50.0				14.3			

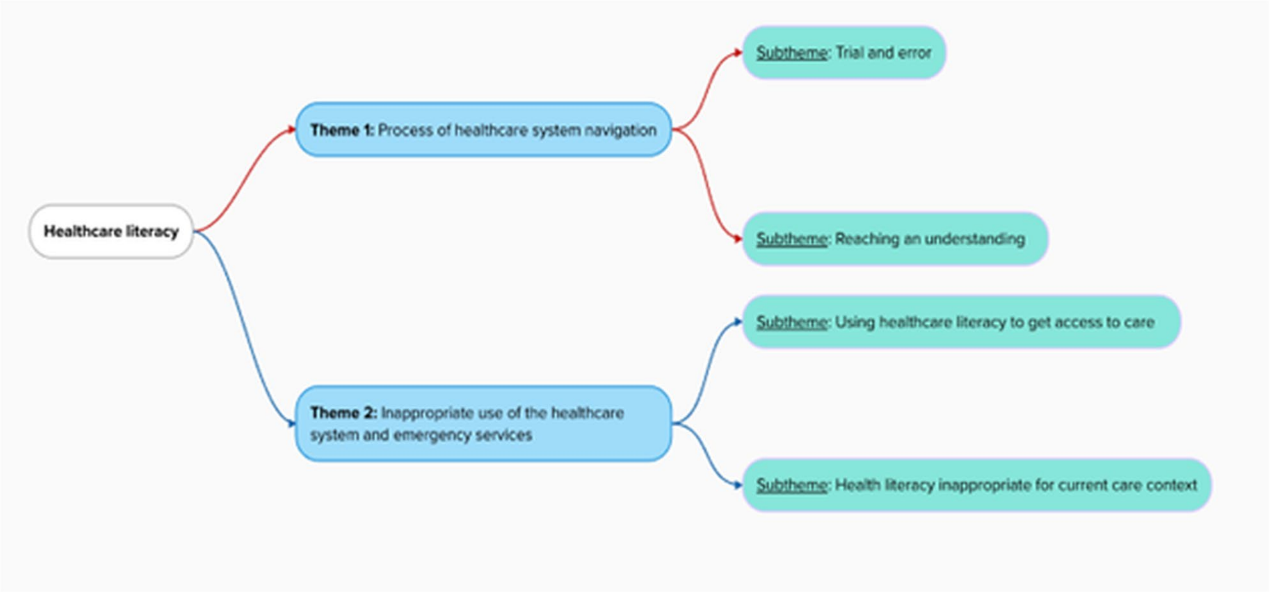

Fig. 2 Mind-map of themes identified from interviews and focus groups

how to access care for illness or injury (acute or chronic) contributed to health literacy. Throughout this process, participants often had to engage in numerous follow-up appointments with various healthcare providers.

Subtheme: trial and error

For both tailored primary care and care as usual participants, navigating the healthcare system involved a learning curve. Participants initially demonstrated limited knowledge on how to use the healthcare system to access care for illnesses or injuries. This knowledge gap decreased over time through trial and error in many cases. Both groups of participants needed to learn how to access the appropriate level of care as part of navigating through the system. During this learning curve, both groups described attempts in accessing emergency services for low acuity issues (e.g., coughs, headaches, twisted ankles), but then encountered lengthy wait times and limited relief following care receipt.

For some care as usual participants, the trial-and-error process resulted in learning that there were specific processes in places for accessing care (e.g., booking appointments, one issue per walk-in clinic visit):

> *"If you were to go to see a walk-in clinic, I don't know what happens to your records after, especially if you don't have a family physician to keep like a trail of your medical history. Secondly, they do not take multiple things. You can't come for a headache and skin care, you have to come for one at a time. … It's like being a student, you have to literally find your way into healthcare." (NCC2).*

Care as usual participants recounted their learning experience as being difficult as they had to find their way around a complex system without care navigation support (e.g., community health worker).

Meanwhile, participants in the tailored primary care group described both successes and difficulties in accessing specialty care. Though one participant noted the ease with which they managed to obtain a referral for a sleep study, another recounted their inability to access specialist care even after several attempts over four years. Participants from this group also noted having to learn how to manage chronic illnesses, including how to access monitoring equipment for their condition:

> *"I'm a bad diabetic; I went into shock twice this week … I got a monitor here, it's supposed to stay on for at least 2 weeks. But it fell off in the shower, the pharmacy said you have to wait a full 3 weeks before you get another one, and me, just believing it, said OK I guess I just have to wait. But then I saw [my primary care provider] today, … and she says you could've just come here, and I would've given you another one. I need to monitor cause if I don't know what my sugar levels are … And if my sugar levels are too high and I drop it, I can go into diabetic shock, and I could go into a coma and die." (UOCCHC1).*

Despite this client having to learn about how to access new glucose monitors for the future, this client appeared to understand the importance of having and using the monitor to avoid adverse events.

Subtheme 2: reaching an understanding

The learning process in which participants engaged in with regards to access to care and health management ultimately contributed to a greater understanding of the healthcare system and health care navigation.

Both tailored primary care and care as usual groups emphasized the importance of preventative care (e.g., pap smears) and monitoring of chronic conditions (e.g., asthma, diabetes, high blood pressure) through primary care.

> *"I have hypertension, so I check my blood pressure when I come here [to the clinic] … I have thyroidism so I do my thyroid function test every 3 months … I don't want to have a crisis. So, I make sure to check that." (NCC1).*

On the other hand, tailored primary care participants appeared to have a more nuanced understanding of illness management for chronic illnesses relative to the care as usual participants. For example, these participants highlighted the importance of lifestyle changes and the use of community programs for managing chronic conditions:

> *"… healthy eating, healthy food can bring people some health. There's a program here [at the community health center] called the GoodFood program, and they have a dietician there … Because they were showing us healthy food and stuff…" (UOCCHC2).*

Participants from the tailored primary care group also noted that their lifestyle changes (e.g., reduction of salt consumption, exercise) at times made it possible not to have to take medications (e.g., blood pressure medications).

Overall, following their initial learning curve, both groups of participants largely demonstrated improved health literacy with respect to appropriate use of emergency department. For example, participants from the tailored primary care group reported using the emergency department as a last resort after exploring other care options (e.g., walk-in services) with sick children. Similarly, care as usual participants noted using other care services (e.g., clinic they could access at their workplace) or over the counter medications (e.g., Tylenol) for their children's coughs and headaches, rather than going to the emergency department.

Theme 2: inappropriate use of the healthcare system

Both the tailored primary care and the care as usual participants demonstrated instances of using the healthcare system in strategic ways to access services. In these instances, participants either demonstrated health literacy that was inappropriate for the local care context or used their health literacy to find ways to access care efficiently.

Subtheme: inappropriate health literacy for current care context

Participants across both groups demonstrated health literacy that did not align with the expectations and structure of the Canadian healthcare system. Care as usual participants described using emergency services (e.g., going to the emergency department or calling an ambulance) due to limited knowledge about how to access appropriate care. Additionally, some expressed expectations around antibiotic prescribing that conflicted with current Canadian clinical guidelines. One participant explained:

> *"I mean, culturally, from where I'm coming from, my son has a cold, and they give antibiotics. But here [in Canada] how do you get antibiotics for a kid? I'm expecting some form of antibiotic … And you go and it's the same story; you are told to wait and see." (NCC5).*

There was no similar finding for tailored primary care group participants. However, despite receiving education on how to navigate the healthcare system, some participants in this group still reported using emergency services for non-urgent conditions (e.g., coughs, colds) that are typically managed in primary care. In addition, participants described confusion around how pharmacies function in Canada. One individual explained:

> *"There are wait times at the pharmacy. Initially, I thought that when you gave your prescription, you would get the medication on the spot, but there is in fact a long wait time to get medication from the pharmacy." (NCCCCHC3).*

This participant appeared to misunderstand both the dispensing process and the role of pharmacies in Canada. Their expectation, that medication would be provided immediately, potentially without the need for a separate clinical consultation, suggests a different model of access in their country of origin, where prescriptions may be filled directly at the point of care or without delay.

Subtheme: using health literacy to get access to care

Some participants used their knowledge of the local healthcare system to strategically access services that they felt would offer faster or more comprehensive care. This subtheme emerged only among participants in the tailored primary care group. One participant explained:

> *"Before [at the clinic], you had to go through several tests before they gave you a prescription. With my children, I am able get medication on the spot. This is what we want. When doctors ask me to pass more exams, my child's condition has time to deteriorate. You must insist on getting the medication right away, and they give you an appointment to pass the tests. That is what I like about the emergency room." (NCCCCHC2).*

This participant demonstrated an understanding of the steps typically involved in primary care (e.g., clinical assessment, follow-up testing, and then prescribing), but perceived this process as inefficient or risky when their child's condition seemed urgent. For this reason, they viewed the emergency department as a more direct route to secure immediate treatment and necessary investigations. While this reflects a form of health literacy, knowing how to navigate the system to achieve desired outcomes, it was not always aligned with the intended structure of the healthcare system. Other participants in the tailored primary care group similarly reported calling ambulances or visiting emergency departments to circumvent long wait times.

Discussion

Health literacy is a fundamental determinant of health, shaping individuals' ability to make informed decisions and navigate healthcare systems. This study explored how tailored primary care influences health literacy among urban marginalized populations by comparing individuals receiving tailored services to those accessing care as usual. Findings suggest that tailored models enhance patients' ability to critically appraise health information, reinforcing the notion that health literacy is not solely a cognitive skill, but also a social and systemic construct shaped by access to support and resources [8].

Participants receiving tailored care scored significantly higher in the appraisal of health information domain of the Health Literacy Questionnaire (HLQ). They more often reported verifying information, comparing sources, and consulting providers, key skills amid rising health-related misinformation, which has been linked to delayed care, lower vaccine uptake, and poorer health outcomes [23–27]. These findings align with research showing that integrated, patient-centered care models can strengthen health literacy by providing structured support and trusted information [14].

This ability to appraise and verify information is not just functional, but protective, helping mitigates the harms of misinformation. In contrast, lower appraisal scores in the care as usual group may reflect greater difficulty in interpreting health information, increasing the risk of confusion and poor decision-making. Enhanced health literacy has been linked to improved chronic disease management, fewer hospitalizations, and greater empowerment; these out comes are especially critical for structurally disadvantaged populations [28, 29].

The only HLQ domain with consistently low scores across both groups was social support, reflecting the well-documented isolation faced by marginalized populations and its impact on healthcare access [1, 18]. As health literacy can function both as a protective asset and a potential risk factor depending on how it is applied [7], these findings underscore the importance of both individual and collective approaches to building health literacy. Qualitative data revealed that while both groups gained some system navigation skills over time, participants in the tailored primary care group demonstrated a more nuanced understanding of chronic disease management and referrals. However, limited awareness of care pathways remained a challenge across both groups, often resulting in the use of emergency departments for low-acuity needs, an issue common among marginalized populations with inadequate or misapplied health literacy [6]. Some participants used emergency services as a perceived "one-stop shop" to bypass delays in primary care, illustrating how deeper knowledge, in the absence of system responsiveness, can lead to inefficient care use. This points to a form of health literacy that, while adaptive, may result in misaligned or inefficient care utilization. Future interventions should therefore aim not only to improve navigation skills but also to strengthen social support and ensure that the health system is responsive and accessible, reducing the need for workaround strategies. These findings also highlight opportunities to refine the tailored primary-care model. In particular, strengthening social-support components and offering targeted navigation and appraisal support, especially for clients newly entering care, may further enhance health literacy outcomes.

Emergency department use reflected both limited awareness of care options and frustration with delays in primary care. This aligns with evidence that people with lower system literacy often turn to emergency services by default [6]. While some used the ED to bypass barriers, this does not imply preference. Marginalized groups frequently report stigma and poor experiences in emergency department settings [30, 31]. That such concerns were largely absent in our data may reflect normalization of negative encounters or greater focus on structural barriers.

Together, these findings underscore the potential of tailored primary care to improve health literacy in urban marginalized settings. While such models enhance critical appraisal skills, broader strategies are needed to bolster social support and system navigation. As health literacy is increasingly recognized as a social determinant of health [1], future interventions should address both structural inequities and individual skill development. Continued research is needed to assess the long-term impact of health literacy interventions and to inform systemic approaches for reducing barriers to care.

Limitations

This study has several limitations. First, the sample size was small, reflecting challenges in recruiting participants from marginalized populations. Barriers such as transportation, work constraints, and confidentiality concerns limited engagement [18, 32]. Recruitment was further affected by timing, availability, and discomfort with video-based methods used during the COVID-19 pandemic, which may have reduced representativeness, especially in the qualitative component.

There were also imbalances between participants in the tailored primary care group and those in the usual care group. Despite outreach through community organizations and flexible participation options, recruitment remained uneven. This highlights broader difficulties in engaging underserved populations and the need for culturally responsive, trust-based strategies [18, 33].

Language was another constraint. Limiting participation to English or French speakers likely excluded some newcomer and refugee voices, groups often facing the greatest barriers to care and health literacy. Their underrepresentation may have narrowed insights into system navigation with limited language support.

Self-selection bias is also a consideration. Participants with particularly strong views or distinct experiences may have chosen to participate, which may have skewed findings and limited generalizability.

Finally, demographic differences between groups, such as age, housing status, or health conditions, may have introduced confounding factors, despite aligned inclusion criteria. Although descriptive demographic information was collected, the study was not powered to examine demographic predictors of health literacy or to conduct adjusted intergroup comparisons. As such, potential demographic influences could not be analysed within the scope of this study.

Conclusions

This study provides preliminary evidence that tailored primary care approaches may support the development of key health literacy competencies among urban marginalized populations, particularly the ability to critically appraise health information. While overall health literacy levels across both groups appeared moderate, the higher appraisal scores in the tailored primary care group suggest that integrated, trust-based care models may strengthen individuals' confidence in evaluating and applying health information.

The qualitative findings enriched this understanding, revealing that participants receiving tailored care often described deeper familiarity with system navigation, more proactive engagement with services, and clearer knowledge of chronic disease management. These insights underscore that health literacy is not only an acquired skill, but a lived, contextual experience shaped by provider relationships, system complexity, and structural barriers.

Persistently low scores in social support highlight the importance of community-based interventions that build both individual and collective health literacy. These findings reinforce the view that health literacy is co-produced by individuals, healthcare providers, and systems, and that strengthening it requires investment in both equitable service design and responsive, culturally grounded care. Future research should examine whether these benefits are sustained over time and explore how tailored models can be further adapted to meet the evolving needs of urban marginalized populations.

Abbreviations

CCHC	Centretown Community Health Centre
ED	Emergency Department
HLQ	Health Literacy Questionnaire
PHC	Primary Health Care
WHO	World Health Organization

Supplementary Information

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Supplementary Material 1

Supplementary Material 2

Supplementary Material 3

Supplementary Material 4

Supplementary Material 5

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Authors' contributions

AM, CG, AE conceived and designed the study. MK, CL, SK, coordinated data collection, performed qualitative analysis. AE, CG and LB contributed to interpretation and critically revised the work. AM and MK drafted the manuscript. All authors approved the final manuscript.

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Data availability

De-identified quantitative and qualitative datasets are available from the corresponding author upon request.

Declarations

Ethics approval and consent to participate

Approved by Ottawa Health Science Network Research Ethics Board (Ref 20190011–01 H, 21 Oct 2019). All participants provided written informed consent. This study adhered to the Declaration of Helsinki for medical research involving human participants.

Consent for publication

Not applicable – manuscript contains no identifiable personal data.

Competing interests

The authors declare no competing interests.

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