Scientific and popular health knowledge in the education work of community health agents in Rio de Janeiro shantytowns

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Abstract

Health education for socially marginalized populations challenges the efficacy of existing strategies and methods, and the pertinence of the educational and philosophical principles that underpin them. The Brazilian Community Health Agents Initiative (CHAI) hires residents of deprived marginalized communities to undertake health promotion and education in their communities. The ultimate goal of the CHAI is to connect populations with the public healthcare system by promoting social re-affiliation, protecting civil rights and enhancing equity of access to health services. In this article, we present the education work of community health agents through interplay between popular and scientific health knowledge in nine Rio de Janeiro shantytowns. A critical ethnographic research design, using thematic analysis, allowed us to explore agents’ education work to enhance family health literacy in shantytowns. Local culture and social practices inspire Agents to create original strategies to reconcile forms of health knowledge in their work.

Introduction

Health education for people confronting powerlessness and social marginalization should work toward equity of knowledge and power, and acknowledges people’s health practices [1] as well as appreciating health-related hopes, priorities and decisions [2]. Health education for people who may have little access to avenues for education, health, social well-being and employment should have the same main aim as popular education: harmonizing professional and popular knowledge [3]. In this article, we report findings from a critical ethnographic study conducted in São Carlos Community (SCC), a compound of nine shantytowns located in the north zone of city of Rio de Janeiro, Brazil. Shantytowns, although marked by social, economic and environmental weaknesses, are also full of opportunities for human potential, trust, solidarity and reciprocity to bloom [4]. We examined the work of community health agents (CHAs) in expanding health knowledge to promote family health in these shantytowns and suggest mechanisms for their effectiveness that stem from augmenting or correcting popular thoughts about health.

CHAs are professionals affiliated with the Brazilian Community Health Agent Initiative (CHAI), created in 1991. The CHAI advances social inclusion through health education and promotion, two mandated tools for improving the health of communities nationwide [5]. The CHAI functions in most municipalities simultaneously with Brazil’s Family Health Strategy, and most CHAs were born, raised and still live in the
communities they serve [6]. In 2002, CHAs were recognized as professionals and their education is currently provided by regional schools of public health [7].

The uniqueness of this article considering the main difference between the worldwide workforce of community workers and Brazilian CHAs is that the latter are officially recognized professionals within a national unified, integrated primary healthcare system targeting all population strata [5–7]. Moreover, CHAs master some scientific knowledge (due to their formal education) and share popular health knowledge with the served population. Here, we report CHAs’ respectful attitudes towards both forms of knowledge.

**Study setting and the Brazilian CHAI**

SCC has a history of resisting government power from the 1950s to the 1970s, mainly by sheltering persecuted political leaders and students during the military dictatorship [8]. São Carlos has welcomed a mixed population: descendents of slaves, poor people, migrants, socially marginalized individuals and low-paid workers [8]. The community comprises urbanized and non-urbanized areas. During the 1900s, due to a ‘modern policy of city modernization and sanitation’, old houses were demolished, new streets were opened [9], and São Carlos Hill was occupied. Nearby, areas of prostitution and a working class neighbourhood were settled during the 1970s [8, 10, 11]. At the time of the fieldwork, SCC was not yet covered by the Pacification Police Unit (UPP in Portuguese), a taskforce whose main goal is to preserve social order and protect citizens’ lives and properties through neighbourhood-based, full-time policing, building resident-police mutual trust and engaging with communities [12].

In SCC, the CHAI aimed to contribute to two aspects of health service reorganization, integration of healthcare professionals’ activities and liaison between communities and health organizations, by having CHAs collaborate with Family Health Strategy teams and local residents to identify health problems, provide health information, and refer residents to health professionals [6]. Furthermore, CHAs follow up with their clients, to ensure successful treatment and to protect, promote and restore their clients’ health [6]. CHAs are increasingly being asked to develop health promotion activities tailored to the community [13]. This new responsibility (unfortunately not supported structurally or financially) incorporates health education aims to enable residents to perceive their social reality, think critically about their social environment, and conceive alternative ways to intervene in their social reality [14].

**Literature review**

According to the National Health Conference, a landmark in Brazilian primary healthcare reform, Brazilians understand health not only as access to health services but also as the outcome of working conditions, education, income, environment, transportation, employment, leisure, freedom, access to land and land ownership [14, 15]. In the 1980s, Brazil’s CHAs were recognized nationwide as popular health educators who link popular and scientific health knowledge [16]. Paulo Freire’s educational philosophy of critical consciousness [3] underpins many of the CHAs’ education programs [14].

According to Ávila [17] and Trape and Soares [18], CHAs use a formal lecturing style when delivering health information to residents, along with prescriptive and normative educational approaches (e.g. blaming and frightening clients). These approaches, which had deleterious effects, revealed CHAs’ less-developed skill in thinking critically about causes of the phenomena they encountered in their practice. But, when trained in critical thinking, CHAs become more beneficial to their communities [17, 18]. Costa, Brito and de Souza [19] trained CHAs to recognize, acknowledge and critique popular traditional knowledge about water quality, understand the context of popular health practices and transfer scientific knowledge to residents. This collaborative, collective learning endeavor significantly reduced cases of diarrhea among infants and toddlers.

CHAs undeniably spurred public participation in democratizing Brazil’s health policy [20]—perhaps
because of their close identification with the communities they cared for, their concern about social solidarity [11] and their interpersonal-relationship assets [21]. However, in an effort to achieve a more positive professional identity, CHAs increasingly downplay this important social competence while emphasizing their scientific competence [22]. CHAs’ education work deserves in-depth investigation, to demonstrate the contribution that informal health education can make to community-health promotion [17], because CHAs may not understand the link between power and knowledge in health [23, 24].

Worldwide, community health workers, agents, promoters or advisors in frontline positions promote, jointly with communities, the health and social inclusion of socially vulnerable populations. They do so with insufficient program funding, restrictive institutional policies, and a lack of culturally appropriate health resources [25]. This happens under inconsistent training [26], unstable work conditions, irregular supervision, undefined professional status, low remuneration, as well as limited opportunities for career development [27–30]. CHAs develop health education initiatives with at-risk and socially vulnerable populations that require meaningful, in-service education to ensure the appropriateness of scientific-knowledge-transfer to their clientele [7, 31]. Relevant also to the population is CHAs’ advocacy for community capacity building, changes to communities, advocating for social justice and reduction of health inequities through challenging institutional policies and management structures [32–35]. This advocacy is mainly due to their understanding that social determinants of health is the root of health promotion [36, 37].

Despite an increasing number of Brazilian studies about CHAs, the nuances of CHAs’ education work remain largely unidentified. Chief among these nuances is the dialectic (conflictual or harmonious) in their praxis, between scientific knowledge (the basis of CHA training) and popular health knowledge (which is built or reinforced in their daily interactions with local residents). There is a gap in the literature concerning CHAs’ popular-health-educator role in shantytowns—where turbulent forces generated by social inequity, urban violence, selling and consuming illicit drugs, unemployment and poverty, greatly complicate access to primary healthcare.

**Study goals**

Our study aimed to identify CHAs’ educational philosophies and the practices they used to promote health-education activities with shantytown individuals and families.

**Conceptual framework**

Freire’s [3] philosophy of education as a path to posing problems and critical consciousness was the conceptual framework that oriented all the phases of this study. Problem-posing was used to uncover the educational approaches during interviews with CHAs. According to Freire [38], educators should concentrate their attention not only on the attainment of educational goals but also on the education process. In fact, learners’ understanding of how their social reality affects learning will help them recognize the need for defiance, consider possible alternatives and then establish learning goals related to the education outcomes they want. Challenging their social reality guides learners’ search for solutions to problems they identify [39, 40]. This process Freire [41] calls ‘critical consciousness’. In Brazilian culture this term refers to a process that allows learners to critically recognize their world and thus take part in transforming it [42].

**Method**

The original study (of which the work reported in this article was part) used a critical ethnographic approach [43]. The Queen’s University (Kingston, Canada) Research Ethics Board and the Ethics Committee, Institute of Psychiatry, Federal University of Rio de Janeiro (Rio de Janeiro, Brazil) approved the research project. Both ethics bodies accepted our justification of the need for an optional oral-consent procedure, because of the secrecy culture in shantytowns as well as past memories of a
military dictatorship that created a collective fear of signing nonofficial papers. Authorization for CHAs to participate in the study was obtained from the Municipal Secretary of Health of Rio de Janeiro (MSHRJ).

Prospective participants were recruited after the first and third authors presenting the research project at a session for 45 CHAs, all of them affiliated with a Municipal Health Centre (MHC). After a general discussion about the research project with the presenters, 24 CHAs volunteered to participate. A minimum of 4 months of work as a CHA in São Carlos was the only criterion for inclusion in the sample. Participation was unpaid, and no other compensation was provided. The study lasted from June 2003 to December 2005 (including two fieldwork trips to Rio de Janeiro).

Data collection started with observation. During three visits to São Carlos [44], the first author spent 12 hours engaged in participant observation of nine shantytowns, guided by six CHAs. She also conducted the interviews. Participants were invited to choose either individual or group interviews. Most participants decided on group interviews with colleagues who worked in the same shantytown. At the beginning of individual and group interviews, the first author and the participants jointly read the informed consent form, and participants were informed about the possibility of providing an oral consent to audiotape the interview. All participants signed consent forms. At the beginning of each interview, an interview guide containing 12 open-ended questions was presented to the participants. Our democratic beliefs, respect for autonomy, freedom of speech and open dialog among health workers underpinned our decision to offer a choice of questions to the participants. In addition, the interviewees spontaneously introduced 10 other topics. The general topics discussed in the interviews and group discussions are presented in Table I. One week later, participants each received a sealed envelope containing a photocopy of their signed consent form. Two individual interviews and five group interviews with 22 other CHAs by the first author were conducted. Empirical saturation was reached after five group interviews.

To protect participant anonymity, interviews were scheduled according to CHAs’ convenience and conducted in a facility near the MHC. The quality of a review of the data understanding by the interviewer immediately after each interview was assessed by the participants. Interviews were transcribed by two Brazilian research assistants. Transcripts were coded by the first author using the qualitative software ATLAS ti, Version 4.2 [45]. This procedure generated 110 codes. Access to raw data in the audiotapes was only granted to first and fourth authors, who analyzed the findings. These researchers met in person in Montreal, Canada to discuss their interpretations of the findings and draw conclusions.

The data-analysis process started with playing the audiotapes. To check the accuracy of each transcript, the first author compared them with (i) notes she had made after each interview (where she identified concepts that could suggest new directions for data collection) and (ii) observations during her visits to the shantytowns. This comparison was fundamental to identifying key concepts that, in turn, guided the choice of themes for the analysis. Findings were explored in depth by selecting and ordering them according to the conceptual framework and the ideological context [46] of education as critical consciousness [3]. Thematic analysis was used to [47] to identify groups of descriptive or explicative representations, classify units of meaning and, from these, create categories of meaning. Thematic analysis [48, 49] unfolded within the merging of three conceptual themes.

All the interview data were analyzed in Portuguese by the first and fourth authors. Four months after data collection, the first author met with five of the participants, who had volunteered to review her synthesis of the preliminary data analysis. In January 2005, the interpretation of findings was complete; however, none of the participants verified the final interpretation, because the original team had changed and the first and fourth authors had no more contact with most of them. Despite this problem, we believe that the democratic process of recruiting prospective participants—offering them a detailed overview of the research project, allowing them to
choose individual interviews or group interviews
with peers, allowing them to choose which questions
to answer and continuous contact with them dur-
ing the fieldwork—ensured the trustworthiness of
our findings, their epistemological validity [50]
and their catalytic validity [51, 52]. Interviews
quotations were translated into English by the
first author and another Brazilian-born health
professional.

Table I. Topics explored in the individual interviews and group discussions

<table>
<thead>
<tr>
<th>Topics proposed by interviewer</th>
<th>New topics introduced by CHAs</th>
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<tbody>
<tr>
<td>Decision to become a CHA and professional identity</td>
<td>Communication between clients and physicians, and CHAs’ participation in medical consultations to facilitate clients’ verbalization of health complaints</td>
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<tr>
<td>Reflections on the training</td>
<td>The process the municipal health center uses to receive referred clients</td>
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<tr>
<td>Personal views about the CHA’s role as health educator</td>
<td>The culture of solidarity in the shantytowns</td>
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<td>Nature of the CHA’s relationship with families and individual clients to establish learning goals</td>
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<tr>
<td>Strategies CHAs used to stimulate criticism, curiosity and questioning among clients, and to search for solutions to problems identified by clients</td>
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<tr>
<td>Views on families’ use of information to transform their health conditions</td>
<td>Government aid for CHAs’ work</td>
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<tr>
<td>Strategies CHAs used to help families decode health information</td>
<td>CHAs’ work satisfaction and frustrations</td>
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<td>CHAs’ understanding of family struggles to find meanings in health information</td>
<td>Education about illicit drugs and the drug trade in relation to clients’ economic needs</td>
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<td>Strategies CHAs used to help clients learn about health and self-care</td>
<td>Partnerships with churches and local leaders</td>
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<td>Interaction between CHAs’ scientific knowledge and popular health knowledge</td>
<td>Scarcity of material resources</td>
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<td>Changes in families’ attitudes after gaining health knowledge and awareness of their potential for self-care</td>
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<tr>
<td>CHAs’ strategies to sustain clients’ health literacy</td>
<td>Development of CHAs’ personal skills to work with the clients</td>
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The interviews. Three conceptual themes did guide the analysis: (i) CHA view of their role within shantytowns, (ii) ways and actions to introduce and integrate scientific and popular health knowledge into a shantytown culture and (iii) approach to harmonize scientific knowledge with popular health knowledge.

Findings from observations

The information collected in the visits was obtained through rapid informal dialog with local residents who did not identify themselves as informants; for safety reasons, findings gained from personal communications are anonymous. It is noteworthy to say that our study took place in a time of social instability in SCC.

Visiting the shantytowns

The shantytowns were visited three times by the first author. During the first two field visits, she accompanied two university-educated nurses and a group
of six CHAs on their home visits. She observed that
the lower parts of the shantytowns were urban, with
paved streets, masonry houses and intense commer-
cial activity. As she walked up the hills, there were
no more streets. According to the CHAs, this lack of
streets forced hillside residents to move individuals
in urgent need of medical care by using improvised
transportation chairs. Moreover, the hillside paths
were very dirty, with open sewers and rats, and lit-
tered with garbage.

An authority parallel to the police was evident. In
several neighborhoods, she saw male teenagers on
motorcycles carrying walkie-talkies, cellular phones
and pistols. Once, she saw a group of these
‘watchers’ (guards) coming toward her and the
CHAs accompanying her as they descended a
steep street staircase. Suddenly, the watchers
stopped and silently opened their arms to block
other people’s way, undoubtedly giving the group
the privilege of passing through. They passed, and
the CHAs neither thanked nor looked at the watch-
ers. Later, a CHA explained the mutual code of si-
lence and that clearing the way was the watchers’
usual way of showing respect for CHAs and recog-
nizing the wellness they promoted in São Carlos.

All three visits to São Carlos allowed the first
author to observe the CHAs’ informal approach
with their clientele. The CHAs generously distrib-
uted condoms to women and men, and even to some
boys, who approached asking, ‘Uncle, do you have
candies for me…er…not for me, for my big
brother?’ Candies, of course, meant condoms and,
in the shantytown, their presence demystified sexual
activity and raised awareness of safe sex. In fact,
safe sex, a CHA reported, had become an issue for
everyone, no longer for youth or adults alone. CHAs
seemed to be unrushed by time constraints.
Apparently, clients were receptive to such an ap-
proach. The CHAs usually talked to a small group
of individuals while walking along shantytown
paths. They sat on house balconies, and chatted in
small bars, churches and stores. Through such en-
counters, the CHAs clarified misconceptions and
transmitted health information, mainly about pre-
vention of common diseases. They were welcomed
into São Carlos homes, and family members chatted
willingly with them.

Findings from interviews

CHAs’ views of their role within shantytowns
The following quotations illustrate some CHAs’
daily context of practice. In attempting to preserve
the local flavor in the original Portuguese quo-
tations, the translator bent some English grammar
rules. First, the CHAs describe their shantytown
clientele:

They cannot differentiate that well the
things…like, some people that are more re-
sistant [to us] are the people with less
information…For sure they [the clients]
feel like, more important. For them, it is
good that they feel important—‘Wow! The
health agent called me, the nurse came to
my house, the nurse came!’ —boosts their
self-esteem…. (Cristina, Group Interview 1)

This quotation depicts the challenges confronted
in CHAs’ practice settings as they faced resistance
with community members. But even within this re-
sistance, shantytown residents maintained a conflict-
ual position. Residents wanted to increase their
status within São Carlos by being associated with
both healthcare providers and CHAs but also
resisted CHAs. Further discussions with CHAs re-
vealed that the resistance of shantytown residents
was mainly due to their experience of domination
by the Western knowledge used by dominant
Brazilian elites as well as the marginalization they
experienced as a result of this domination.

Nobody does want to come here to see the
community’s reality. Are these life conditions
of human beings!? Neither a dog lives aban-
donied like that! How could I talk about fruits
and vegetables with this people? We do what
is possible… so much abandon, dirtiness, dis-
grace that I never imagined existing near close
to me. (Rodrigo, Group Interview 5)

Health somehow does represent the public au-
thority, government power, the society power.
They saw us like that power. The community
is not totally abandoned. I could not say that but the government could do a lot to help our work...more sanitation like in the city.

(Aldir, Group Interview 4)

Resistance was a means to challenge ‘scientific’ knowledge and Western conceptions of health and illness as well as government (or authority) figures. Despite the resistance faced, the efficacy of CHAs’ education works (sometimes barely acknowledged by themselves) and the impact of their own personal knowledge, reshaped peer–peer health teaching to make it more humane. Their somehow-idealistic persistence provoked subtle expressions of acceptance by the local community:

But as we were gaining trust from the community...but it took time, they opened their doors and started to talk about difficult things about their health and way they dealt with it...but they still are afraid that if we know about them, we may tell to their neighbours...they have a lot of concerns about their health and safety. (Aldir, Group Interview 4)

Power-sharing was also a source tension on both sides: SCC residents including CHAs, and professionals in the MHC:

My client was not able even to speak about her problems, for this reason, I opened the doctor office’s door and said: I am sorry but she is my client I am here to speak for her! I did not care about his reactions. I did insist that I had the rights to help her. I do this always...I go to hospitals, clinics with my clients when I do know that I must be there to speak for them...we are people from the poor community. (Rosa, Group Interview 4)

Reconnecting socially marginalized clients who had been disconnected from primary healthcare and promoting their social inclusion seemed to be a particular challenge:

She has three kids and she never went to a gynaecologist. I said to her to come here [the municipal health centre]...she came but my face was on the floor because when she came it was 7 am sharp and then, the security said: no more numbers for today consultation! She did not know how things worked here. She stayed a long time in the triage waiting. She went to the triage and I saw her and she said: I am here without breakfast...I trusted you, please, help me.

(Albert, Group Interview 2)

CHAs talked about their conception of popular health education in the shantytown context, inspired by their understanding of popular health education and being aware of their growing acceptance by local residents, CHAs taught their clients how to improve their overall health, using their knowledge of São Carlos and language that residents understand:

Guide and prevent, guiding people so they will not get sick and, if they are already sick, to get a treatment...Because we are people from here and we have a little more of information, a little bit more of education, isn’t it? Not like that with scientific terms, they don’t get that. (Ana, Group Interview 5)

The CHAs acknowledged the impact of shantytown living conditions on their practice. Moreover, these conditions influenced expectations of their role. For example, local residents wanted free monthly food baskets from the local government and unrealistically expected CHAs to intervene to promote access to social programs for which they might not qualify. The CHAs acknowledged such needs, as well as the need for more health education and greater access to social programs. Participants believed that health-education priorities compelled them to honor their commitment to São Carlos residents. Furthermore, often times, community conditions (including extreme poverty) necessitated the CHAs to change their role, sometimes from providing health education to providing social support. A CHA described how the shantytown conditions affect his work:

Sometimes you go to a house where the people don’t have that much food to eat. Then there you are, not only a health agent...
but a kind of psychologist. She [the client] puts everything to you: ‘F***, I am without a job.’ (Robert, Group Interview 2)

Poor physical conditions combined with poverty created more challenges for CHAs. One CHA described a client’s home environment:

The conditions were not OK, because of the sewer that passes under the house. It’s a cabin, it’s a small ranch, you see. Then the sewage invaded the house so the family had to leave. (Samuel, Group Interview 4)

CHAs were not only concerned with physical environments in terms of hygiene, but they were also concerned with safety mainly to the risks of precarious wood houses and hills sliding during rainy season. This results from a huge accumulation of domestic garbage threatening the stability of physical structures. It is an issue that expands CHAs’ role as health educators to include the promotion of environmental health.

CHAs did not want to collaborate with drug lords or allow them to indirectly influence their work, because they wanted to protect their own families’ and relatives’ safety and freedom. They knew about the life-threatening issues faced by people under the drug lords’ control. Only a few CHAs overtly disclosed their opinion on this topic; many avoided commenting on it.

**Ways and actions to introduce and integrate scientific health knowledge into shantytown culture**

CHAs chose informal dialog to introduce health topics and create a favorable context for teaching and learning. Dialog also helped to establish informal bonds:

When I stopped by in a bar... I pay attention to the person, a lot of guys hanging out and the conversation flows. And I sit in the bar and start to talk to the guy near to me... Someone says: You should visit that house... I immediately have a doubt and go there. (Barry, Group Interview 2)

So that CHAs could get to know families and then (as CHAs described) prevent the withholding of any relevant health-related information, they utilized informal dialog and tactics:

If the client goes to the health centre and is not welcome what does happen with my work... lack of credibility. But the person says I was there because of you and I was not well cared. I will never come back there. Then, I try to contour, contour, contour the situation. (Branco, Group Interview 3)

They believed that friendly contact would help them to successfully approach clients who tended to neglect their health and felt threatened by the CHAs’ follow-up.

I started the conversation: Hi, what’s going... there is a lot of cases of gonorrhea going on in the community. The guy says: really... tell me about that. I replied: the situation today is difficult, so many people in contamination around and the disease is everywhere, a lot of teens sick. Are you seeing the danger around... so bad, for your friends. (Matrix, Group Interview 3)

CHAs used storytelling within their practice. Overall, storytelling restricted CHAs’ needs to ask direct or intrusive questions, nourished their clients’ curiosity, applied the concept of risk to actual health situations, taught about the need for clinical follow-up and showed that CHAs valued self-care. Clients also tended to assess their own clinical conditions and self-care behaviors, comparing them with the characters’ failures and successes.

I told the story of a pregnant teen like her who never did go to the pre-natal clinics because she was very stubborn, rebel and her baby did born in the street... Some cases are true but other not. She did listen about the case and asked me about herself. (Branco, Group Interview 3)

Their clients were continuously curious about the fictional characters’ adherence to medical treatment and their clinical evolution.
She [the teen] asked a lot of questions. Questions like parents taking drugs despite their health problems; how she could help if they’re in prison, how to help them to free themselves from drugs. (Magaly, Individual Interview 1)

CHAs used the shantytown’s cultural and social capital—interest in neighbors’ daily lives and the appreciation of storytellers and improvisational musicians—to integrate scientific and popular knowledge.

Yes, I like to invent stories. It depends on my inspiration...I improvise right there! (Barry, Group Interview 3)

Yes, it’s my Number 1 trick, such as ‘Last month, my neighbour passed away...a heart attack. Do you know why? He knew nothing about hypertension...he ate salty, fatty food, no exercise at all’...Sometimes, it is true; sometimes it is just a fake story. (Magaly, Individual Interview 1)

Certain diseases required more creative teaching methods. For tuberculosis, the CHAs prepared a picture album illustrating the advanced stages of the disease. For diabetes, high cholesterol levels, and arterial occlusion and hypertension, they drew metaphorical representations of body systems. The most common representation was the image of a house and its drainage pipes. To teach prevention of leptospirosis and dengue, they stressed community responsibility for keeping environments and homes clean, and for supporting the work of São Carlos’ garbage collector.

Considering their lack of specific training in teaching methods and developing educational materials, the CHAs acted intuitively when deciding to work with popular health knowledge and allowing their clients to talk about themselves. Such intuitive actions suited a dialectical context, where clients talking about themselves led to awareness of their own problems.

She does not believe she is sick. She believes that it is due to emotional disturbance because of the gang dispute. That’s why I listen to her so much. She does need to talk about that. It is difficult to explain her condition to her. (Albert, Group Interview 2)

...and sometimes when they learn they share information with their neighbours: ‘My neighbour went to the doctor, and I visited him and told to him everything you taught me about high blood pressure.’ They became multipliers of information! (Monica, Group Interview 5)

Very often clients brought up concerns about interactions between herbal teas and allopathic medicines. As the CHAs did not have pharmacology knowledge, they felt unable to differentiate the benefits and risks of such drug interactions.

In her case, she uses some leaves, medicinal herbs...so, I do not have any words to say to her at that moment, honestly, because if she ceased to use them I will not know which effect they had on her, so, I will not have words to say about that. (Fabiana, Individual Interview 2)

Because of these knowledge gaps, CHAs retreated from situations where they lacked authority to diagnose or to impose their opinions on clients:

Alright, you can take your tea but you must follow your treatment! But I cannot tell her if the tea is dangerous for her. She may say that I am younger than her and I do not know anything about life yet...so I said to her that’s fine. (Lili, Group Interview 1)

Clients themselves learned to analyze hypothetical clinical conditions and worst-case scenarios if they stopped self-care. Pictures and diagrams supported the CHAs’ teaching of illiterate learners about how to schedule taking medication (e.g. at sunrise, with meals or coffee breaks, at sunset, or at bedtime), treatment procedures and the unfavorable evolution of poorly treated conditions. To assess learning, CHAs asked clients to demonstrate self-care procedures, appraise their effectiveness, and explain the underlying reasons for their effect.
Maria: Yes, I do demonstrate... I say how she should do to help her to learn how to prepare it [the home made hydration solution for kids’ diarrhoea].

Rodrigo: In my way, I teach the person and I do with her. (Group Interview 5)

This approach also involved the use of a hypothetical case of disease progression, with a question–answer discussion about the consequences of stopping self-care.

To stimulate and provoke, I use a pith of fear... let’s suppose that her blood pressure is very, very high. ‘Did you eat bacon?’ Then, she replied: ‘Yes, I did but I really like to eat it... because I think that eat sometimes do not provoke any trouble’. I replied: ‘It may not cause trouble today but it can damage you, put you at risk of a heart attack’. So, she becomes afraid and more interested: ‘Why this will happen?’ The result is that I can explain everything to her. (Magaly, Individual Interview 1)

CHAs did not report using any materials or strategies for learning reinforcement. They frequently invited family members to participate in self-care training with clients, because they believed that family members would supervise and collaborate in the clients’ self-care.

Approach to harmonize scientific knowledge with popular health knowledge

In their work with clients, CHAs accommodated personal values and popular beliefs, and avoided prohibiting clients’ daily application of popular health knowledge, after Freire’s approach. They respected any prior knowledge and waited for clients to appraise the effectiveness of solutions the clients had chosen.

All the families I enrolled did not have a water filtering system; all of them did drink water in the tap. Today, most of them in my area do have a filter (Fabiana, Individual Interview 2)

If these solutions failed, then CHAs used the opportunity to introduce scientific health knowledge. Because their clients’ lack of scientific knowledge emotionally touched the CHAs, they were truly open to popular health knowledge and beliefs.

In the case of a lady undergoing TB (tuberculosis) treatment, her relatives regularly did separate her cutlery. We did learn that it was not to separate objects, we must boil them; keep the room with good air circulation, with open windows. I did teach them very slowly to help them to change their minds. In the community we have a lot of people like them. Prior to our work, a lot of people had a mind so narrow, closed. (Lili, Group Interview 1)

Because CHAs believed that their clients might not trust them in the future, they avoided giving them advice based on traditional medicine or belittling popular-knowledge therapies. To reconcile scientific and popular health knowledge, CHAs used five major strategies that will be described and illustrated by quotations in the next five paragraphs.

The first strategy used by CHAs was to assess the clients’ pre-existing popular health knowledge. They listened to their clients as they explained their current thoughts, meanings and beliefs about their health conditions. Then, CHAs utilized probing questions to better explore the popular health knowledge of clients:

She believes in herbs. Then I asked, ‘For which health problem Macaé tea is good for?’ She explained that the tea was good for several problems, including intestinal parasites when mixed with milk... works for abdominal pain. Other herbs when titrated with vinegar are good for back pain. (Albert, Group Interview 2)

Second, CHAs clarified misconceptions about client’s knowledge. This helped to identify gaps in client’s popular health knowledge and scientific health knowledge, so that both forms of knowledge could be harmonized to enable clients to improve their current health status. Clarifying
misconceptions often involved questions, which led to dialog. This reciprocal dialog enabled clients to achieve a new level of consciousness:

She compared herself with a neighbor who badly cared for himself and had huge complications. Then I asked, ‘Why do you believe he did relapse? (Claudia, Group Interview 2)

The third strategy used by CHAs was to acknowledge the benefits of popular-knowledge treatments. This involved the harmonization of scientific or pharmacological knowledge with popular or folk remedies. Herbal-tea treatment was a common form of knowledge that CHAs acknowledged helped clients to improve their health status:

Some teas can actually reduce the blood pressure... we can also learn with them and, by taking some tea, she may control her pressure. (Giovanna, Group Interview 3)

The fourth strategy used by CHAs was to illustrate the seriousness of diseases and the need for professional assessment or follow up. Illustrating the seriousness of disease ensured the clients prioritized their health and took action to improve it. Moreover, although CHAs acknowledged the use of herbs and teas while educating clients, they emphasized the importance of scientific knowledge and following health professionals’ recommendations:

I said to her, ‘It is not only taking the tea that your problem will be solved. You must also follow the treatment to be totally sure about which treatment is the best one. (Giovanna, Group Interview 3)

The fifth strategy involved interpreting clients’ beliefs about the causes of their diseases and setting attributed causes in a broader context. These involved taking into consideration social determinants of health (including physical environment) and other contextual influences. While interpreting clients’ attributed causes of disease, CHAs identified and demystified incorrect popular knowledge:

She got the St. Mary’s herb that blossom close to the sewage drainage. Then, when her child had a convulsion, she said that it was due to intestinal parasites because they live in a dirty environment. They believe that convulsion is always a matter of parasites! (Carla, Group Interview 2)

CHAs also did demystify overgeneralization of chronic disease consequences. They taught their clients about their health conditions and identified both scientific and popular health knowledge that their clients could use to maintain or improve their health:

It is not because your diabetic father had their legs cut off that you will have to undergo the same thing. His disease was uncontrolled! (Robert, Group Interview 2)

Discussion

The CHAs promoted equity in knowledge by bringing together the shantytowns’ social and cultural capital, cultural knowledge, social and historical contexts and solidarity network to understand, and act on their community’s social-determinants-of-health inequities. As knowers of the learners’ world [40], the CHAs were well positioned to become progressive educators (those who can seize the moment and be with their learners ‘here and now’) ([40], p. 45). In this way, the CHAs could help their clients to recognize themselves as capable of learning and gaining awareness of the potential transformations of their world. The practice of progressive educators (compatible with democratic dreams and ethical attitudes) incorporates curiosity, humility, tolerance, openness and enhanced critical ability into the creative art of teaching [17; 40]. Freire [41] emphasized that learning is not just consuming pre-conceived ideas but, instead, learning mobilizes learners’ potentialities. It can be done by creating capacity for learners to find their own responses to their questions, creating and re-creating their world within their socio-cultural contexts.

São Carlos residents did not fully acknowledge CHAs’ practice of progressive health education. Such residents resisted enrolling in educational initiatives, because they perceived CHAs as
instruments of dominant power and knowledge [24]. CHAs were seen as representatives of the local government and as health workers partnering with traditional healthcare providers.

Our findings corroborate Nunes, Trad, Almeida, Homem and Melo’s seminal findings [21] on CHAs’ unawareness of the efficacy of their own knowledge and their friendly approach to gain families’ cooperation. Our findings also corroborate Mack, Uken and Powers’ findings [53] on community workers’ efforts to rebuild trust between marginalized populations and the healthcare system. Like Buchabqui, Capp and Petuco [54], we found that CHAs took a highly affective approach (tenderness, hugs, touching and smiling) in their pedagogical encounters and felt that clients gave them permission to participate in their social reality.

Our findings demonstrate why and how CHAs’ strategies to tailor health communication to a socially marginalized population were effective. CHAs brought to their work their courage to be humane, to frame conditions of economic deprivation and human misery according to community, not institutional logic. For CHAs, knocking on a door asking if someone has a problem would not be enough; they felt that they must enter each home, sit down and chat [55]. To respond to each family’s uniqueness, CHAs made the health information they communicated relevant to each individual and tailored information exchanges and education work to each family’s unique reality. CHAs also contextualized health messages, supported knowledge transfer and encouraged clients to spontaneously compare their own attitudes, behaviors and conditions with others [56]. So, contrary to Ávila’s, and Trapé and Soares’ findings of authoritative and normative teaching approaches in CHAs’ praxis [17, 18], our observation and interview findings revealed teaching approaches that respected the culture and history of individual and collective life in shantytowns, particularly São Carlos, a well-known site of political resistance. The CHAs fundamentally respected common-sense knowledge and approached new issues as progressive educators [31]. This attitude required humility, acceptance of power limitations, awareness of conflicts in sharing power with MHC health professionals [57] and acknowledgement of CHAs’ own knowledge gaps.

CHAs play an intriguing role: mediator between scientific and popular health knowledge. They simultaneously transmit contradictions and possibilities for a profound dialectic between the two knowledge forms [58]. Because CHAs understand that health improvement is an investment in São Carlos’ future, health education in this shantytown responds to more than a need for immediate results [14]. The interplay between popular and scientific health knowledge evident in CHAs’ practice is an example of the CHAs realizing that scientific knowledge would change neither popular conceptions about nontraditional medicine nor cultural knowledge about health and illness. To reconcile these distinct forms of health knowledge, the CHAs respected popular knowledge as non-subjugated logic, equal and parallel to the logic of the formal healthcare system [59].

CHAs were sensitive to their clients’ negative past experiences with health professionals in traditional healthcare organizations. Consequently, herbal medicine predominated among socially marginalized people because of their historically limited access to healthcare services; they created this cultural knowledge to survive. Herbal medicine is a common way to treat illness within Brazilian shantytowns [60] and, even though Brazil’s Ministry of Health published a manual to help CHAs teach their clients the correct use of pharmaceutical medications, Nunes, Amador and Heineck [61] documented significant knowledge gaps among CHAs on how to use pharmaceuticals medications and when to respond to clients’ doubts about those pharmaceutical medications’ effectiveness. As Nunes, Amador and Heineck did, we found that CHAs wanted more training on this matter.

The CHAs struggled to awaken São Carlos residents’ consciousness about their potential for health literacy, which will overcome knowledge inequalities. The context of such education work necessitates redesign of interventions to deal with inevitable social-justice issues, and of lives not only deprived of opportunity and choice but also...
full of cultural and sociopolitical challenges and moral ambiguities [62]. For many in the shantytowns, both formal and health education invoked dreams of wellbeing, of freedom from the ignorance that constrained their access to the benefits to which they were legally entitled. However, CHAs’ democratization of scientific knowledge should not be interpreted as a populist act. Instead, it was a progressive, emancipatory act, because ‘it is impossible to democratize the choice of content without democratizing the teaching of content’ ([40], p. 110). CHAs’ democratization of knowledge is an example of critical education through networking and formation of a ‘community of knowledge’ ([63], p. 17).

Increasing power, equality and emancipation of socially marginalized people through informal health education were some of the underlying major issues of CHAs’ works. When the CHAs began, São Carlos residents did not have experience with the discourse needed to claim their civil rights; a ‘culture of silence’ predominated. In fact, meetings between CHAs and their clients created an education process that allowed both to grow [40]. CHAs led clients to transformative awareness of the need for social justice and equity of access to healthcare responsive to the shantytowns’ social reality. This awareness was preliminary sign of clients’ empowerment to begin ‘reading the world’ differently [63]. CHAs experienced São Carlos as a place to combine disparate kinds of health knowledge, discourse and practice. In shantytowns, unequal access to healthcare reinforces the need for an emancipatory, humanist paradigm, for critically rethinking public-health activities [64]. Such a paradigm allows healthcare professionals and clients to develop realistic understandings of how governments can ensure health equity and access to healthcare across all classes, ethnic groups and genders.

In summary, our results present a new knowledge on the need for programs to training CHA on how to harmonize scientific and popular knowledge to improve health. This has been neglected in the literature on this topic, in search for efficacy and effectiveness of scientific knowledge, with its resulting domination of western knowledge at the expense of what is really important to achieve excellent health outcomes.

Implications for health education practice and research, and recommendations

Our findings indicate the need to document in a future study the innovative products and processes that CHAs created (e.g. metaphors, fables, music lyrics and life stories) to acknowledge CHAs’ communication competence. Through this documentation, we may discover the essence of educational practices whose goals are to create autonomy and health literacy through egalitarian partnerships. Future studies should also examine and analyse the impact of dialectical listening through metaphor on teaching and learning, as well as CHAs’ motivations for using their personal life stories and improvising fictional health stories in pedagogy.

Our findings also reveal the incontestable need for health education initiatives to mobilize popular health knowledge, health practices and health beliefs in socially isolated and culturally bonded shantytowns. National and international programs should focus their training efforts to target not only scientific knowledge but also popular knowledge as well as the interplay and dynamics of popular and scientific knowledge through the reinforcement of popular knowledge as a core skill in the repertoire of knowledge required by CHAs. Popular health educators should be recognized as experts and strategic advisors in health education. Given shantytowns’ poverty and social marginalization, no outsider would be able to devise an educational program that matches the capabilities and potential of dispossessed learners. Popular educators must receive effective training to deal with health problems in their communities. Discussion by CHAs and Family Health Strategy team members should openly analyze the content of Brazil’s CHAI and identify the special skills needed by popular educators for communication, conflict management, risk appraisal and teaching. We recommend that professional health educators and health promoters
broaden their views about the effectiveness of popular health educators. Health education for socially marginalized people is a complex process [63, 64], demanding specialized knowledge developed in collaboration with the local people to empirically support simple, realistic health-education approaches.

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