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ORIGINAL RESEARCH

Mamás de la Frontera: Empowering perspectives of Indigenous community health workers along the Putumayo River in the Peruvian Amazon

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ABSTRACT

Introduction: Indigenous peoples in Peru have experienced significant disparities in health and social well-being due to ongoing settler colonialism. Despite significant progress in maternal and neonatal health, regional disparities persist. In response to these challenges, the *Mamás de la Frontera* (Mothers of the Border) program was developed in collaboration with Indigenous communities in the Peruvian Amazon. The program involved training and advocating for community health workers (CHWs) to improve culturally appropriate maternal and child healthcare. This study focuses on the experiences of CHWs as they transitioned from training to community practice.

Methods: Ten CHWs from participating communities near the district of San Antonio del Estrecho were interviewed individually in a semi-structured manner. The transcripts underwent qualitative hybrid coding, integrating an inductive and deductive approach to thematic analysis. The CHWs also participated in a workshop designed to collect their experiences and expectations regarding program training, roles and direct service translation.

Results: Upon applying thematic analysis, four primary themes emerged: (1) roles and responsibilities, (2) cultural practices, (3) training, translation and dissemination, and (4) barriers and needs experienced by CHWs. Each theme included respective sub-themes, providing more detail and specificity. The photo workshop complemented the formalised qualitative findings, further emphasising the perceptions and feedback of CHWs regarding topics such as role satisfaction, community dynamics and belonging.

Conclusions: The findings reinforce the existing empirical evidence on the experiences of Indigenous CHWs, emphasising the components of program implementation and the adaptation of healthcare delivery in rural Amazonian settings. CHWs play a vital role in promoting maternal and child health and community well-being. The implications of this work are to further inform culturally integrative, strength-based community health programming, prevention strategies, advocacy, resource development and health system reform, with the aim of better supporting Indigenous populations in Peru.

Keywords: Indigenous, community health workers, maternal, child, prevention, Amazon, Peru.

Abstract in Español at the end of the article

INTRODUCTION

Colonialism has impacted both shared and unique experiences for Indigenous peoples around the world. Colonialism perpetuated into the present day has led to the disruptions of the natural environment and kinship systems, to the fragmentation of cultural knowledge systems, languages, spirituality, and ceremonial practices [1,2]. The historical and contemporary impacts of settler colonialism in countries such as Australia, New Zealand, Denmark, Norway, Sweden, Canada, and the United States on the health, social, economic, and cultural outcomes among Indigenous peoples in recent years have been documented in the empirical literature [3]. However, perspectives from the regions of Latin America are limited, and expansions to critical discussions about how Indigenous experiences and critical analyses expand settler colonial theorizing is needed [4]. Decades of forced silence and exploitation have severely altered the dynamics of vulnerable communities, especially those in Peru.

From the Amazonian basin to the Andes, the Indigenous peoples of Peru have endured oppression, racism, cultural disconnection, epistemicide and genocide since the arrival of the Spanish conquistadors in 1532. The introduction of the Spanish language, currency, religion and Eurocentrism has altered the lives of Indigenous peoples ever since. Active persecution and the intensely negative stigma of being and identifying as Indigenous continues to this day. It was not until 2001 that Peruvian Indigenous communities received acknowledgement in the national constitution, almost two hundred years after gaining independence from Spain. Today, these communities still experience infringements of their civil liberties, particularly with regard to rural health and education [6].

As perpetuated by the settler colonial agenda, regional health inequalities persist despite national improvements in Peru, specifically in relation to birthing practices and neonatal outcomes. Neonatal mortality remains high in the Amazon rainforest. Poor hygiene and infections are a leading cause of death in Indigenous communities. The COVID-19 pandemic further exacerbated these outcomes [7,8]. The United Nations Interagency Group for Child Mortality Estimation (UNIGME) reported that in 2020, 5 million children under the age of five died in Peru, half of whom were newborns [9]. At the same time, certain progress has also been achieved. Between 2000 and 2020, neonatal mortality was reduced from 16 to 7 per 1000 live births [9]. Moreover, gaps in care, such as skilled birth attendance and antenatal care, are being addressed [10]. This success has been attributed to overall improvements in addressing social determinants of health, socio-economic programs, and targeted maternal, neonatal, and child health interventions [11,12]. However, not all have benefited from this progress equitably. Significant socioeconomic and health inequalities persist, especially among those experiencing poverty and living in rural areas [13].

The setting

Loreto is Peru's largest department. Located in the Amazon rainforest basin in the north of the country, it is home to a large and diverse Indigenous population spread across vast, remote areas. It has one of the region's worst maternal and neonatal health indicators [14]. According to the 2010–2012 Demographic Health Survey (DHS), the estimated neonatal mortality rate is 19 deaths per 1,000 live births, with approximately 55% of these deaths likely under-registered [12]. Further evidence from the World Health Organization International Standard Verbal Autopsy Questionnaire among women in Loreto suggests that neonatal mortality among Indigenous communities may be even higher, with infections presented as the leading cause of death [15,16]. Thus, a focus on emphasizing protective factors, birth justice, and community-engaged intervention strategies to mitigate adverse drivers of Indigenous health is imperative within the context of decolonial diverse Indigenous communities [17,18].

In response to the unmet need in underserved and rural Indigenous populations, the *Mamás del Río* (Mothers of the River) program was developed by a research team at the Universidad Peruana Cayetano Heredia (UPCH) in collaboration with 79 Indigenous communities in the rural districts of Nauta, Parinari and Saquena of Loreto department [19,20]. The intervention provides training of community health workers and traditional birth attendants, collectively referred to as *Agentes comunitarios de salud*, or herein referred to as community health workers (CHWs). The program, initially implemented in 2015, aims to integrate contemporary clinical care with traditional and cultural practice considerations to provide community evidence-based health education, tablet-enhanced home visitation, and improved home births. The intervention has proven effective in promoting essential newborn care (ENC) practices for in-home births, increased access to hospital facilities, and rural health emergency plans, healthy behavior changes among mothers related to thermal care, cord care and breastfeeding improved. Moreover, changes were sustained over time, despite the onset of the COVID-19 pandemic and respective timeline and implementation shifts [7]. The project has been recognized for its innovative approach and its ability to adapt to the cultural and contextual needs of Amazonian communities.

Through the recent success of the *Mamás del Río* program, the *Mamás de la Frontera* (Mothers of the Border) program was developed and launched in 2020. Phase one involved program curriculum, protocol, and material adapted and has been successfully implemented in 30 communities along the Putumayo River in El Estrecho and Soplín Vargas in Peru, and Puerto Leguízamo and El Encanto-San Rafael in Colombia [21]. The innovation of the program is rooted within the training and service of 30 CHWs between men and women (1 per community), 43 midwives, and 56 health professionals. Measuring the knowledge of CHWs in both

countries before and after the training resulted in a near doubled score in health indicators of maternal-neonatal care. Additionally, the integration of project supervision and support visits confirmed the consistency and effectiveness of CHW practices [21]. Phase two of the program is currently being implemented in a total of 38 communities, including 22 in Peru (10 in the Putumayo district, with San Antonio del Estrecho as its capital, and 12 in the Teniente Manuel Clavero district, with Soplin Vargas as its capital), and 16 in Colombia. The *Mamás de la Frontera* training curriculum is implemented at three points. The initial training occurred in January 2024 and most recently again in July 2024.

The current study

The current manuscript outlines a qualitative study aiming to advance the empirical literature by engaging 10 Indigenous CHWs to better understand the application and functions of program implementation and transitions, training translation and practice, cultural inclusion, and emotion regulation. Due to the high presence of guerrilla warfare in Teniente Manuel Clavero, CHWs from those 12 communities in Colombia were not able to engage in the current study. Thus, participating CHWs were from the 10 communities in Peru near the district of San Antonio del Estrecho. CHWs traveled from their respective communities to gather in San Antonio del Estrecho for 8 days of training in January 2024 and 4 days of training in July 2024. The purpose of the January training was to provide information on CHW functions and to train in leadership, pregnancy and newborn care, pregnancy test administration, home and institutional births, tablet use, and the objectives of each home visit. The purpose of the July training was to review the content covered in January, with a special emphasis on issues identified during the five months of fieldwork. Training included maternal breastfeeding, oral health, violence prevention, anemia, and contraceptive methods, as well as reviewing home visits and services provided in between the training sessions within their respective communities.

CHWs participated in semi-structured individual interviews at both training timepoints pertaining to their training and transitions into their roles in the community, how they have translated their training into practice, evaluations of training materials and content, cultural inclusion, and emotion regulation through the following research questions: Firstly, what is the sociocultural and demographic profile of the CHWs included in the scope of the *Mamás de la Frontera* project? Secondly, what are the perspectives and experiences of Indigenous CHWs during training and in their work within Indigenous Amazonian communities?

Theoretical framework

Interculturality has been conceptualised from three perspectives: The relational, functional and critical perspectives. Relational interculturality refers to the connections, exchanges and interactions between cultures, emphasising the relationships between groups that hold different cultural practices, knowledge, values and traditions, which are often understood in terms of equality or inequality. Functional interculturality recognises diversity and cultural differences as they are integrated into social structures. It promotes and fosters dialogue related to coexistence and tolerance, based on the impact of existing and dominant systems where inequalities and the systems themselves are not questioned. Critical interculturality recognises cultural differences as they are shaped by a racialised and hierarchical social structure and matrix. In this study, we adopt an intercultural approach, viewing it as a framework, tool and process supported by diversity and the complex interconnections between people. Interculturality is underpinned by the transformation of social structures, institutions, relational dynamics, and the unique and diverse construction of conditions for being, thinking, knowing, learning, feeling and living differently [22].

This study is guided by an intercultural framework encompassing relational, functional and critical dimensions. This framework has informed the design of the study, the collection of data and the interpretation of findings. From a relational perspective, we understand the experiences and perceptions of CHWs as shaped by their daily interactions with families, community authorities, and health personnel. Accordingly, purposive sampling prioritised communities in the region of focus, and interviews explored the trust built through their work, as well as spaces for coordination and conflict resolution. The functional dimensions inform the investigation into how traditional knowledge is incorporated into program materials and resources, and the semi-structured interview guides include questions about adaptations to practice by CHWs and their limitations. Finally, from a critical perspective, the results highlight the devaluation of local knowledge, and ethical procedures include the administration of informed consent. Interpretation of the results is organised around the recognition of ancestral knowledge and proposals for structural transformation.

METHODS

Positionality

Consistent with critically transforming qualitative methodologies and self-reflexive praxis in relation to Indigenous communities, we acknowledge and highlight the identities and backgrounds of the researchers as they relate to the current study and to the Indigenous communities involved [23, 24].

ROA is a psychologist based in Lima, Peru. Her professional background includes working with social programs under the Ministry of Women and the Ministry of Development and Social Inclusion, focusing on vulnerable populations. She also leads social responsibility projects supporting community mental health among university students from Indigenous backgrounds. She balances clinical practice—treating adults with depres-

sion, anxiety, and grief—with her academic role as an assistant professor at the School of Psychology at UPCH.

MR is a citizen of the Haliwa-Saponi Tribe and of Indo-Fijian descent, residing in the Pacific Northwest, USA. For nearly a decade, she has worked with rural and urban Indigenous communities, supporting culturally informed health promotion and prevention strategies through Indigenous research methodologies and systems of care. She joined the *Mamás de la Frontera* project as a fellow through the Indigenous Wellness Research Institute at the University of Washington, which connects Indigenous early-career researchers with Indigenous communities globally. She is currently an Assistant Scientist at the Center for Indigenous Health at Johns Hopkins University.

AAF is a licensed nurse and public health specialist in Lima, Peru, with experience in maternal and child health programs across rural Amazonian communities. She collaborates with national and international partners on health research focused on maternal and neonatal outcomes, pharmacovigilance, and community health strategies. AAF currently serves as the Regional Coordinator of the *Mamás de la Frontera* project.

GGB teaches in Intercultural Bilingual Early Childhood and Primary Education programs and in graduate-level courses on reading and writing didactics. She has worked on early childhood policy at Peru's Ministry of Education and trained in-service teachers across levels. She is currently a faculty member at UPCH's Faculty of Education.

HLT, an Aymara anthropologist and educator, focuses on intercultural education, sociolinguistics, public policy, and community health. He has taught at various institutions in Peru and Bolivia and is currently a specialist at the Ministry of Education of Peru and a lecturer at UPCH.

CAR is a Quechua physician and public health professor with expertise in interculturality, migration, and border health. He has served as a consultant for PAHO and teaches at UPCH. His recent work includes digital vaccine innovation and training for Indigenous health agents across Andean-Amazon border regions.

MMB, a Quechua public health physician, directs the *Mamás del Río* program and leads Indigenous health advocacy at UPCH. Her work centres on community-led, culturally grounded health approaches in the Amazon and national-level advocacy to integrate community health workers into Peru's health system.

Community-based research

Mamás de la Frontera was developed using community-based research methods, which prioritise community partnerships as the foundation for research practice. These approaches are collaborative, engaging community and academic partners to develop strategies and objectives in response to community needs and to develop methods and dissemination strategies appropriate to the respective communities and populations. These efforts are guided by the objective of promoting positive social change, which is fostered through research that seeks to empower communities and effect changes in policy and practice. Community-based research is inclusive, recognising the unique strengths and perspectives of collaborators and the community. It is used alongside dominant academic approaches to implement projects which often use multiple, innovative data collection and analysis methods that reflect the diverse expertise, cultural contexts, Indigenous worldviews and experiences of those involved. Furthermore, community-based research is defined as research conducted with and for, rather than on, members of a community [25].

The program was developed in collaboration with Indigenous community partners and various stakeholders, including academic institutions and the Ministries of Health of Peru and Colombia, as well as the Ministry of Foreign Affairs. The aim of this cooperation was to encourage all parties involved to commit to improving maternal and child healthcare and reducing neonatal mortality by training CHWs. The training curriculum was designed based on World Health Organization (WHO) guidelines on maternal and neonatal health. Regarding child health, the information was structured according to the standards and manuals of the Peruvian Ministry of Health (MINSA). Prior to commencing phase two of the *Mamás de la Frontera* project, a population census was conducted across 26 communities in Putumayo and Teniente Manuel Clavero in November 2023. During this process, each community was assessed, and local leaders (caciques) were visited to present the project. Community members were invited to select a CHW, preferably a woman who had the community's approval. Fourteen of the communities were already familiar with the project from phase one, where most CHWs were men. In this new phase, there was generally support for appointing women to the role, although some communities still opted for male promoters.

CHW training

The training process is a structured series of educational activities designed to facilitate learning and prepare CHWs to provide timely care to pregnant women and newborn babies (see Figure 1). In this sense, the training enhances and reinforces the knowledge, skills and relational dynamics necessary for functioning as health promoters during in-person service visits with families. An overview of the topics covered in the January and July training sessions can be found in the supplementary materials. The training is best understood as community health education, developed within the community and informed by its respective culture and worldview, to support informed and accurate health communication and autonomy, and to promote human development [26]. The training process is androgynous, with CHWs actively participating in and exchanging knowledge with one another. They also actively provide and analyse information. In this learning process, there-

fore, there are no hierarchies between facilitators and participants; they are on equal terms in the exchange of knowledge through open dialogue. Given the diverse roles that these individuals assume in their lives, the training process is flexible and adapted to each participant's circumstances and schedule. Finally, the shared content is accompanied by topics, questions or prompts that are presented or detected in real time. In this way, the learning environment enables CHWs to address and solve real problems in their community with the support of their peers [7].

The training process involves identifying knowledge gaps and learning modalities among CHWs, so that the training can be adapted to their needs and circumstances. Two relevant aspects are considered within the training process. One is the context of diversity as a characteristic because knowledge and understanding are embedded differently within cultures. The training process includes cultural context and knowledge practices so that learning is relevant, significant and respectful, and so that the CHWs can act as mediators between the community and official educational culture [25, 26]. Thus, an Indigenous worldview and approach to acquiring and defining modalities of acquiring knowledge are emphasised. For Indigenous peoples, experiences encompass all the senses in order to understand a phenomenon, acquire knowledge, and interpret it. Contrary to Western notions of objectivity and positivist reasoning, integrating diverse perspectives, subjectivity, multiple ways of knowing and being, experience and emotions support the holistic acquisition and sharing of knowledge through traditional methods [2, 27, 28].

Semi-structured interviews

Two semi-structured interviews were conducted with CHWs using the respective interview guides for the training sessions in January and July (see *Supplementary materials*). The first set of interviews, which focused on knowledge interpretations, meanings, emotions, thoughts and identity construction, was conducted immediately after the initial training in January. The second set of interviews in July covered the same topics but focused on how the training materials and content had been applied and sought insights into their evaluative value in relation to cultural and traditional knowledge. The interviews lasted between 30 and 90 minutes and were facilitated by ROA and GG. MR observed the July interviews. The interviews were conducted in Spanish and took place in or near the location where the training had been held. Two interviews with CHWs in July were conducted within their respective communities, in line with the research team's site visits.

Participatory workshop on visual records

As part of the training schedule, a participatory workshop was held to collect the CHWs' expectations and emotions regarding their role and the training process. The workshop also aimed to explore the meanings, emotions, perspectives and construction of identity through the CHWs' positions and relationships within their respective communities. The workshop lasted approximately 1 hour and 30 minutes and was facilitated by ROA and GG. Visual records in the form of photographs taken by the CHWs between January and July were presented, and the CHWs described the challenges and most rewarding moments they had experienced in their work thus far. The workshop was guided by prompts such as: Why did you choose this photo? What were you doing in the photograph? What is the story behind the services provided in this photo? How did you feel at that moment?'

Participant eligibility

Written invitations to participate in the program were sent to the communities, who were also asked to select a CHW. The chosen CHW had to reside in the community and be willing to undergo training and work as a volunteer, either with or without prior health experience. Ideally, the CHW would be a woman. The selection process required the recognition and approval of community leaders to ensure that the candidate was well integrated into and accepted by the local environment.

Participant consent

CHWs were selected by their respective communities and reported to *Mamás de la Frontera* program coordinators. The team sent an invitation to each CHW to participate in training workshops held in January 2024. At the start of the training, each CHW received an informed consent form, which included photo release and research findings dissemination agreements. Any questions the CHWs had were addressed, after which they signed the document to indicate their voluntary consent to participate.

The CHWs, who were selected and recognised by their respective communities, reported to the coordinators of the *Mamás de la Frontera* program. The team sent an invitation to each CHW, inviting them to participate in training workshops held in January 2024. At the start of the training, each CHW received an informed consent form authorising the use of images and audio recording of the interviews. The consent form was read aloud and explained in detail. It was also provided in written form, and all questions were addressed before each participant signed individually. During the Photography Workshop, explicit permission was given for the use of images for research and publication purposes. The process emphasised participant autonomy, including the option to refuse to be photographed or recorded, or to withdraw authorisation at any time without facing any consequences for participating in the study or program activities. Participants were also informed about confidentiality, as well as how recordings and other materials would be safeguarded and stored securely.

Data analysis

Hybrid coding

A hybrid approach was employed that uses both inductive and deductive coding strategies [29]. Deductive coding is a top-down method in which codes are determined by a particular theoretical framework or by what is already known about the literature on which the research questions are based [30]. In this case, the codes were developed a priori, emphasising interculturality and multiple worldviews, as well as cultural and social diversity [22, 31]. Inductive coding is a bottom-up method whereby codes are developed through textual data analysis to identify domains and themes and derive meaning from the data [30]. Therefore, the codes were developed a posteriori rather than a priori [31]. Hybrid coding involves combining codes generated from the data with theory-informed and research-question-driven codes. It also involves modifying theory-driven codes and creating sub-codes from those generated by inductive coding [29]. A codebook was developed to include primary codes (umbrella codes encompassing main ideas) and secondary codes (sub-codes falling under primary codes). The codebook acted as a living document to keep track of the iterative coding process and ensure validity by outlining primary and secondary codes, along with their definitions and examples [32, 33]. The coding procedure involved two members of the research team: the first and second authors.

Inclusion of two coders ensured reliability in view of the sample size indicative of saturation [34, 35]. Dedoose 9.2.12, qualitative data analysis software, was used for data management and analysis. Further reliability and validity measures were integrated through the software's code-specific inter-rater reliability; results are reported using Cohen's kappa statistic [36]. Cohen's kappa statistic evaluates inter-rater agreement based on each coder's application of the codes to determine the agreement rate. Dedoose adopted a pooled kappa statistic to summarise coder agreement across multiple codes [37]. There are various standards for evaluating the 'significance' of a Cohen's kappa value. Measuring nominal scale agreement among multiple coders suggests the following kappa values: <.40 = poor agreement; .40–.59 = fair agreement; .60–.74 = good agreement; and .75–1.0 = excellent agreement [38, 39].

However, the most appropriate standards for a particular research project are determined by the research team and the contexts through which the data are collected, analysed, and reported. In the current study, hybrid coding was employed and coders tested inter-rater reliability using the most common a priori codes, achieving a rate of 0.69 which indicates 'good agreement'. Given the generative nature of the hybrid coding process, continued conferencing, code naming and application shifted throughout the analysis process to support the development of posteriori codes, which emerged and were confirmed after the initial testing phase. To mitigate bias and enhance interpretive transparency, researchers maintained reflective memos and discussed positionality during coding and theme development. Throughout the hybrid coding process, RA and MR discussed code names, definitions, and applications to identify where and why agreement or disagreement occurred, before moving on to the next stage of the analytical protocol.

Applied thematic analysis

Further categorization and comparison emerged from the analysis, which was implemented using applied thematic analysis (ATA). ATA is an approach that identifies and examines themes surfaced from textual data. ATA can be employed for both primary and secondary data [40]. The primary focus of ATA is to comprehensively present the stories and experiences through the voice of participants [40]. ATA involves a systematic review of texts and excerpts to group specific words or domains, which in the current study were generated through hybrid coding and referred to as codes. Codes were used to develop descriptive themes that appear across the entire sample [41]. ATA was employed to identify patterns or unique circumstances in an abductive process, clustering descriptive themes to generate analytical themes [42,43].

Ethics and consent

This study was approved by the Institutional Research Ethics Committee (CIEI) of Universidad Peruana Cayetano Heredia, an autonomous body responsible for protecting the rights, well-being, and safety of individuals participating in research. Its primary role is to review and approve research projects to ensure compliance with ethical standards and both national and international regulations. This study received approval on October 10, 2023, under the code SIDISI 212324. The approval reflects compliance with the University's standards, scientific and ethical guidelines, risk/benefit assessment, qualifications of the research team, data confidentiality, among other criteria.

Additionally, the *Mamás de la Frontera* team requested permission from the respective communities to access and collect information during the intervention days. At the beginning of each workshop, informed consent was presented to the CHWs, explaining the purpose of the study and requesting permission to audio record and take photographs during the intervention and community visits.

RESULTS

A total of ten individuals, representing ten communities, participated in the training and agreed to become CHWs for the program. Six of these individuals were identified as women and four as men. The average age of the CHWs is 40 years, ranging from 19 to 58 years. The CHWs were assigned participant IDs; however, to ensure further anonymity, each CHW selected a pseudonym to be referenced in this manuscript. Additional demographic information regarding Indigenous affiliation,

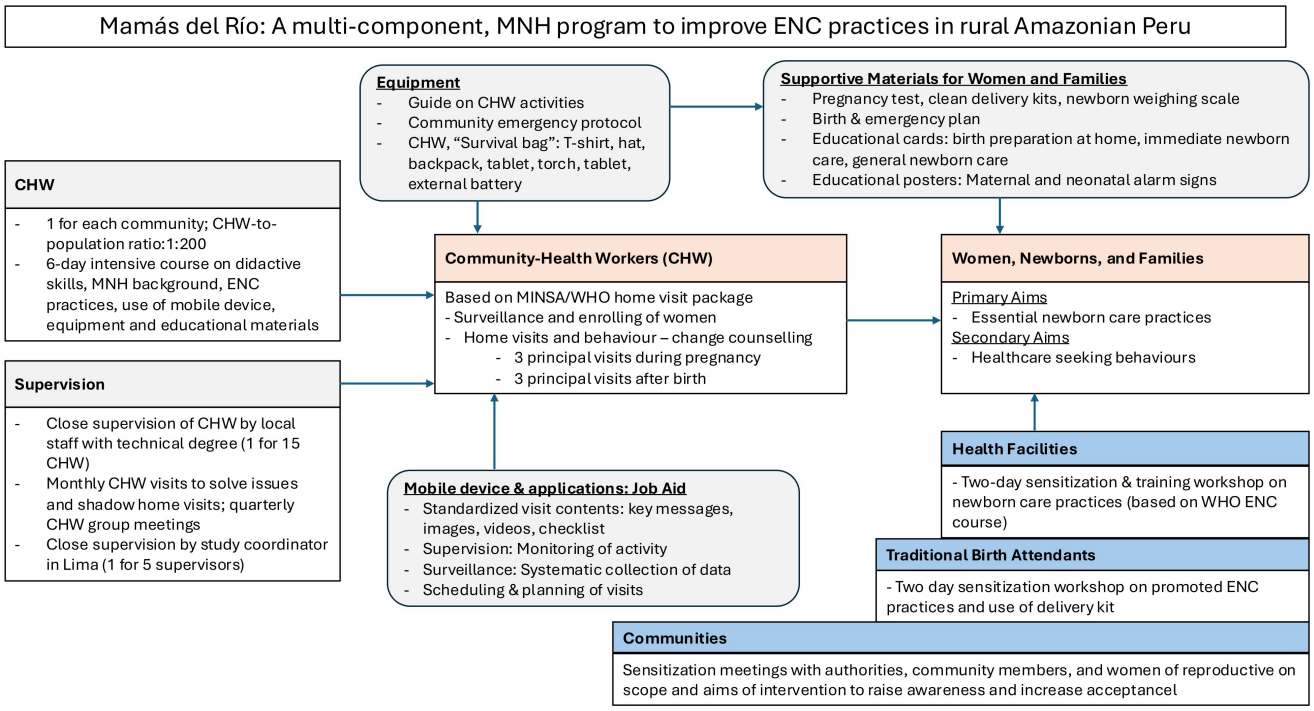

Figure 1. Graph outlining the CHW training process and pedological approach for the Mamás del Rio program emphasizing Maternal and Neonatal Health (MNH) and Early Newborn Care (ENC) [19].

language, education and occupation can be found in Table 1. All CHWs identified as parents caring for children. As the role of a CHW is voluntary, many reported having other primary income-generating occupations. Some had previous experience as CHWs, while others had worked in community health education and social service programs (e.g. vaccinations, birthing, anaemia, malaria, dengue, oral hygiene, etc.). All ten CHWs participated in the initial training in January 2024 and nine attended the follow-up training in July 2024.

Hybrid coding produced 10 primary and 6 secondary codes. The full codebook, along with its respective definitions, can be found in the supplementary materials. In line with ATA guidelines, quotes are presented throughout the thematic findings to provide examples of raw qualitative data directly quoted from participants. These are accompanied by interpretation and paraphrasing where appropriate. Quotations are used to capture the narrative richness and context of CHW stories and experiences, in line with the study's focus on illustrating participants' personal narratives. Upon ATA, four primary themes emerged: (1) roles and responsibilities, (2) cultural practices, (3) training, translation and dissemination, and (4) CHW barriers and needs. The following section describes and expands on each of these themes and their subsequent sub-themes in response to the research questions posed. Excerpts are included from both the January and July training sessions.

Theme 1: Roles and responsibilities

Theme 1 outlines the roles and responsibilities of CHWs as noted through participants' personal accounts. It specifically addresses how they came to fulfil the CHW position as representatives of their communities, and their commitment to providing services and meeting the needs of those they aim to support. Theme 1 is further delineated through the sub-themes of emotional response, empowerment and community education. One CHW describes the process of being nominated and selected for the program, and the community's expectation that they would learn and then offer their knowledge back to the community:

> *"Well, they told me…because [there] were several candidates, there were like three of us, and then what they told me…"we, madam, we trust you. Because you are not going to be like the other people who have been chosen…you are going to be the one who is going to bring us information…you are going to learn and [then] come and teach us."* (Santa María, January)

The emphasis on the community selecting their respective CHW is interpreted as a commitment to trustworthiness and community involvement. Many participants recounted how their selection as CHWs aligned with the communities' confidence in their ability to support mothers and families. They also emphasised that their role as CHWs is rooted in a responsibility to those who entrusted them with the opportunity to provide additional services to their community.

> *"I have my opinion on what they have chosen me for, first of all, it is because I like [this work], I think…because they had confidence in me, and I don´t want to disappoint them."* (Santa María, January)

Similarly, another participant spoke about their role as a CHW as being a commitment not only to their community, but also to themselves, in addressing first-hand the needs and gaps in care:

> *"That is what they are always telling me, but I, as I tell you, it is my obligation. I have committed myself…to the community, I have accepted this position, because I know what is needed here."* (Santa María, July)

CHWs described how their role and responsibilities extend beyond the aims of the program to include advocacy. They were personally invested in the well-being of their community members and often shared resources as they were able.

> *"...not only, as I was telling you, Mamás de la Frontera are not only going to fight for pregnant mothers, children under one year old. I´m obviously here for everything, I tell you, to support whoever it may be. I have a little bit of medicine there that I have left over, from what they´ve given me from the health facility, I offer it."* (Picaflor, July)

Emotional response

The subtheme of "emotional response" captures the emotional experiences of the CHWs as they transitioned into their roles and provided services. More specifically, it describes how they engaged in regulating their own emotions while learning and providing services. One participant shared how their engagement in the initial training in January has given them confidence in their role, which in turn has driven their desire to learn.

> *"I feel…very excited, because for the first time I am participating [as a community agent] and thanks to my community…they have chosen me with complete confidence. And that´s why I´m here. And it helps me to learn what I didn´t, more or less, know."* (Palomita, January)

Initially, many CHWs described feeling apprehensive about being selected as CHWs. They engaged in hands-on training, which was a new experience for many of them, and an opportunity in which they wanted to excel. Many mentioned feeling nervous and afraid to speak up during training sessions. However, between January and July, the CHWs explained how they had learned to overcome their nervousness and embrace the process of providing direct care.

Table 1. Participating CHWs, pseudonyms, and basic demographics.

CHW id	Pseudonyn	Community	Age	Gender	Primary language	*Indigenous affiliation	Level of education	Occupation
01	Santa María	Puerto Aurora	33	Female	Spanish	Kichwa	Incomplete Secondary	Homemaker
02	María	Nuevo Porvenir	33	Female	Spanish	Kichwa	Incomplete primary	Farmer
03	Riquelme	7 de Mayo	40	Male	Kichwa	Kichwa	Primary	Forager of local foods
04	Moa	Esperanza	58	Male	Spanish	Murui	Primary	Farmer
05	Palomita	Nuevo Horizonte	49	Female	Spanish	Kichwa	Incomplete primary	Fisherman
06	Mari-posita	Flor de Agosto	19	Female	Spanish	Kichwa	Incomplete Secondary	Homemaker
07	Monica	Ere	39	Female	Spanish	Murui	Incomplete primary	Farmer
08	Juan	Puerto Elvira	45	Male	Spanish	Murui	Primary	Farmer
09	Picaflor	Nuevo Perú	36	Female	Spanish	Yagua	Incomplete Secondary	Farmer
10	Sol	Siete de Agosto	56	Male	Maijuna	Maijuna	Primary	Farmer

> *"I was…nervous, the first time, you can´t even speak, you feel embarrassed... like you´re shaking, right? You don´t have that courage, that practice, of course. First time, you feel it´s hard, but then [with practice], like that, more or less, it goes by..."* (Juan, July)

Sharing emotional experiences throughout the interviews in January and July exemplifies growth in confidence and self-awareness strengthened over time. For many CHWs, the training provided educational opportunities that they described as rarely being offered to their communities. Even more rarely, these opportunities focused on centralising the voices of community members and offering support to strengthen the community's capacity and resources, rather than providing external support.

Empowerment

Several CHWs commented on the subtheme of empowerment. Many of them were mothers themselves and they attributed their contributions to the program to their personal experiences of childbirth, childcare, and overcoming resource barriers.

> *"More than anything, I think, as a mother myself, that it is a new thing that we have to learn for us to be more careful with our newborn, or during childbirth, let´s say, we as mothers, or mothers who are going to giving birth, for me it would be, I think about myself, right? that has to be practiced, we have to, I feel so committed to this issue…"* (Santa María, January)

Many participants said that training with the program had encouraged them to serve their communities better and to grow in confidence by engaging in health advocacy.

> *"I had those dreams when I was young, of being, belonging to what is health. But, due to life circumstances, I have not achieved it. And then, now when they appointed me to be an agent, for me it has been a step towards my dreams that I had. And then, as I return and repeat, as I told my mother, for me my dreams came true, because now I belong to what is health, although not all areas, but in some things yes. So, for me it is very important and I love it a lot."* (Santa María, January)

CHWs described that taking part in the program and providing direct services further fuelled their passion for health promotion and supporting women in their communities:

> *"I´ve always been [involved] in terms of women´s rights. I tell you, we all have the same rights. Here there is no man or woman, we have the same rights, and we all must be respected, we must all be heard."* (Picaflor, July)

In particular, the men emphasised their responsibility to serve in this capacity, supporting mothers and promoting risk prevention within families.

> *"[I am] collecting knowledge, for the right…to defend my community, more than the mothers…From this training we can present ourselves as, thus speaking, health promoters, who we are as men…We have the obligation to do this."* (Sol, January)

Empowerment was also centred on receiving training to deliver community education and working alongside the community to deliver services. As one CHW noted, "The community must be there with us" (January). Another participant shared that:

> *"...in my assembly, I cannot hide anything in my population, if [I am given] something to give them, I give it to them…Because of their trust. I come to [trainings] to receive more guidance, more teachings, more learning, to educate my mind more than I am sometimes closed. Because I have never expected [I would do this work]."* (Picaflor, January)

Participants described feeling empowered and autonomous in their role as CHWs, contributing to the well-being of their communities, supporting mothers, and improving access to reliable and efficient care in rural settings. CHWs said that this opportunity has not only brought them joy and fulfilment, but also a greater confidence in knowledge sharing.

Theme 2: Cultural practices (strengths-based, positive)

Theme 2 highlights the cultural practices inherent in strength-based approaches and the positive outlook of CHWs, placing a strong focus on cultural and traditional knowledge in maternal and child healthcare. Many emphasised the importance of cultural revitalisation and fostering cultural connections as integral to providing care. While Western medicine has provided effective care, the paradigms and services associated with this approach are not inclusive of, and often dismiss or invalidate, traditional practices that have supported community well-being for many generations. "Culture is important because we do not want to give up our customs; some of them are valid" (July). CHWs call for the broader integration of cultural knowledge in health training and education. This has also been promoted by government entities and grassroots organisations, not only to ensure cultural integration and continuity, but also to guarantee that the content and resources resonate directly with Indigenous populations.

> *"...the Ministry of Culture asks us, the state, the government, that we should not clear [i.e., move away from, stop practicing] our customs in the culture of the people. Based on that…I am also registered internationally, Colombians are an institution of the culture of the Colombian people, then it is necessary to register [i.e., identify as*

> *Indigenous]...I am like the wise man…I know my cultural dances, I know how and what [medicinal] drinks we have, we consume our original foods...*" (Sol, January)

Another participant noted that cultural knowledge should be better integrated into the training program as a whole, providing a direct example:

> "*...very little of [our] cultural knowledge had been included and that this knowledge had basically been collected in workshop conversations, but that [is not] seen much in the materials…the topic of the herbs…helps a lot... that is, they are used after childbirth…so that they can remove the placenta or those blood clots. There are [those] in the community [who] take [these herbs] warm after giving birth to clean what is left and would consider that this could be included in [training too].*" (Moa, January)

Traditional medicine

The subtheme of traditional medicine acknowledges the cultural significance of plant-based remedies, which are widely recognised as effective and safe, particularly in areas where health posts and clinically trained providers are not easily accessible. The majority of CHWs specifically mentioned herbs and natural teas as aids for childbirth and pain management.

> "*...when a pregnant woman is going to give birth, they give her those cotton leaves. With that, it warms us more and helps the baby.*" (María, January)

Another shared about plant medicines that specifically target rehydration:

> "*There is a medicine…the banana plant... when they cut it, they dig the root, that...water sprouts. That water is also very effective for diarrhea. And we have also practiced that with our children. Before, well, we did not have the [health] post.*" (Moa, July)

With regard to incorporating training, knowledge and medicine into culturally inclusive, coordinated care, CHWs suggested that open dialogue be encouraged to support training materials and resources developed by Western-trained and traditional practitioners alike. More specifically, community leaders and clinicians should work together to identify effective strategies.

> "*I would say…[include] traditional doctors. They [i.e., experienced professionals and community leaders] should decide which ones are good, which ones are not. In a... let´s say, in a meeting…to make a single decision…to talk, because dialogue is also sharing knowledge.*" (Picaflor, July)

CHWs emphasised the need to better incorporate cultural and traditional knowledge systems into health education, training and broader knowledge sharing. They described how Indigenous communities and their families have passed down practices that have sustained their well-being across generations. They also argued that more intention and opportunities should be given to combining ways of knowing in order to advance evidence-based, culturally inclusive approaches to care and prevention strategies.

Theme 3: Training translation and dissemination

Theme 3 describes the experience of CHWs in receiving their training, and how this training is translated and disseminated in practice with their respective communities. This theme is further delineated through the sub-themes of "strengthening skills" and "barriers to care". CHWs noted that participating in the training helped them to strengthen their skills and acquire new knowledge, enabling them to engage more effectively in providing direct care. Despite having to travel considerable distances from their communities to participate, many CHWs maintained an open mind and a strong willingness to learn. At the January sessions, CHWs were asked specifically how they envisaged utilising their skills and training in practice, in anticipation of the follow-up session in July. One participant specifically hoped that there would be supportive knowledge transfer to younger generations to carry forward community health practices.

> "*Well, I see myself in my role six months from now, right? Working with them hand in hand, that is what I want most, to work hand in hand with them, and see how to serve them, give them what I have learned, and most of all, with the children. Seeing a child being trained with, let´s say, all the procedures or all the topics that we have learned, seeing that little one being trained, for me, it would be, truly, quite nice to see…I would love it.*" (Santa María, January)

Many described the process of training and disseminating services and resources as coming naturally. This is because being both a representative of their communities and a trusted community member supports the receptive integration of information.

> "*The easy part for me has been to be there with the community. They already know me more than anything else, and as I told them, I am going [to the training] to learn and to be able to bring them some positive information, and…they have accepted me a lot and they have collaborated with me.*" (Santa María, July)

Strengthening skills

CHWs specifically spoke about the opportunities they had gained from expanding their knowledge base and skill sets in order to provide care to the community, as well as the applicability of the training to other components of their lives. They also spoke about how they had grown in confidence and embraced their knowledge base between the initial training and the follow-up training:

> *"First workshop in January, I was in the clouds, I didn´t know what I was going to do or what I was going to say. Now I know…they ask me questions and I already know what I´m going to answer…I have some knowledge. First time... I felt like I was caged, not knowing what I was going to do. Locked in knowledge, but now I can move around more…."* (Picaflor, July)

Participants recounted how they used the tablet provided through the program to access training modules, videos, client services tracking and related materials. They said that they would return to the tablet in between training sessions and client visits to refresh their knowledge.

> *"…sometimes, twice a week, before the visit, I also check to remind…everything there on the tablet, how to explain [i.e., provide services], right? Everything about... what one is going to be taught, what one takes on the first, and on the second visit. The visit guide is also for that. That has been more useful for me, the tablet. Because there…we have videos of how to teach. In other words, they are virtual trainings."* (Mariposita, July)

CHWs also identified how, through this opportunity, they were strengthening bonds with their own familial and community relationships:

> *"I feel like I´m going to learn to express [myself] more, I´m going to be able to talk more (laughter), and actually be more confident."* (Mariposita, January)

Barriers to care

CHWs also discussed the barriers to providing direct care to the community with regard to community members' apprehensions and perceptions about receiving care. Specifically, mothers and families are hesitant to visit health centres, not only because of the distance, but also because they have either not received respectful and adequate care themselves or have heard negative accounts from others. One CHW shared that, during her visits, she provides education and preventive care, but there is a lack of continuity of care within formal clinical settings. They describe:

> *"…how to care for the newborn and... and, um, how can I tell you, give the mother confidence that they can go, give birth at the health center. Because some don´t want to go, because they don´t give them good care; others don´t want to go because they don´t want to be seen. Just as she is a first-time mother, she told me that she doesn´t want to, that she is a little embarrassed that the nurses, or the obstetrician are seeing her..."* (Mariposita, July)

It was also mentioned that there was a general scepticism about external programs, especially those being tested or evaluated.

> *"One woman said, "Why do they only come with studies and studies? Why do they only come with some things that we practice?" Before, these things didn´t exist, we didn´t look at all of this…and why do they only come with studies now?."* (Santa María, July)

Given the history of mistreatment and unethical research practices in Indigenous and rural communities, CHWs emphasised the importance of building relationships and trust as part of the programs. Although they are members of the communities they serve, their capacity as CHWs has sometimes been called into question. This is especially the case when CHWs do not have the resources to provide food or other items for families, which is a cultural norm when visiting someone's home or asking them for something (e.g. participation in a voluntary program activity). One CHW described this as follows:

> *"When I did... activities... I felt bad. They told me that... when I have a meeting, they say to offer you something, well, I don´t have anything that I can offer you."* (Mariposita, July)

The CHWs spoke about their responsibilities and the cultural protocols they follow. If someone invites others to a session, meeting or home, for example, it is customary to offer gifts, food and drink, and other appropriate items. However, CHWs do not have the funds or resources to provide such offerings. While some external programs suggest that attending sessions and learning opportunities benefits program participation, certain cultural nuances and practices should be acknowledged and honoured. However, CHWs have outlined the necessary needs and resources to minimise such barriers to care.

Theme 4: CHW barriers and needs

Theme 4 highlights the barriers experienced by CHWs, their expressed needs, and the resources and support they requested in order to provide better care to their communities, as well as to support the future participation of CHWs in programming and sustainability.

CHWs emphasised that this role is voluntary and requires an additional time commitment on top of their other responsibilities, such as paid work, caring for their children and families, or participating in other programs themselves.

> *"We do everything we can at a given time, [but] we are also parents, we have commitments. But that space is left, we do everything we can to fulfill the tasks that we were given."* (Moa, July)

CHWs also said that the support they provide to community members is reciprocal. CHWs can provide better care when community members are receptive, supportive and open to the program and its offerings. Although community members do request services and sessions, CHWs commented that there are evident barriers to providing care due to transport issues and the rural location of the area.

> *"...the community always supports me, and sometimes the difficult thing is, as I say, the transportation…but they understand, I tell them sometimes I will not be able to come this week, because it will be difficult for me, so I will be on the way, at least half the week I will be on the way, but they wait for me that day because I want to go visit, [but the rurality]..."* (Santa María, July)

Image 1. Photo of community engagement provided by Maria from Nuevo Porvenir.

As noted in theme 3, CHWs experienced barriers to care with regard to cultural norms. It is customary for someone who is visiting a home or providing a direct service to gift items or food. But, many CHWs do not have the funds or resources to provide this:

> *"They say, "because paper can´t be eaten." What are we going to do?...and they said they wanted me to treat her to a [beverage when I visit a mother]. Where am I going to treat her if I don´t earn a penny."* (Mariposita, July)

Some community members and individuals receiving care have misconceptions about the role of a CHW, suggesting that CHWs are paid to carry out services. However, these roles are voluntary and CHWs fulfil them to benefit the well-being of mothers and families in their communities. They offer support grounded in the values of kindness, equality and well-being:

> *"That´s your job, because you´re earning a salary', I don´t earn a salary, but I fight for my patients, I told [them] that. I´m not earning a salary, but I´m still saving lives in my community…To have a position, you have to have that kindness, that compassion with everyone... whoever it is, whether Colombian, foreign, Brazilian… We all have to be equal, I didn´t like that."* (Picaflor, July)

The CHWs recognised that limited funding impacted on the barriers they and their clients experienced. However, they continued to support the project and its mission to support Indigenous families, despite these challenges. They expressed hope that the *Mamás de la Frontera* program would continue and expand to provide additional training opportunities, building capacity, resources and educational development within their rural communities. They specifically requested:

> *"That [we] would continue to [have] more workshops so that we can continue to improve, to be more of a person than we know ourselves to be. Because sometimes, here we express ourselves among ourselves, but we don´t know how to express ourselves in front of the public, all that. That´s why some people are nervous, they are embarrassed."* (Mariposita, July)

The need to advocate for resources, salaries and cross-border policies to support CHWs was emphasised in order to provide better care for mothers, children and families, and to honour the time, commitment and responsibility of those serving as CHWs.

Participants expressed the strong need to advocate for adequate resources, stipends/salaries, transport support, ongoing training and culturally relevant materials. They also called for mechanisms to enable formal recognition and cross-border policies that would allow CHWs to deliver better care to mothers, children and families, while acknowledging the time, commitment and responsibility their roles entail. These needs are exacerbated by persistent barriers including rurality, travel costs, time constraints, considerations regarding cultural norms such as offering gifts during home visits and community misconceptions about the voluntary nature of the position. All of these factors may influence CHWs' service provision and the sustainability of programming.

Photo workshop in July

During the July training session, a workshop was held to share the experiences and emotions of the CHWs. Participants brought a photograph representing an activity they had carried out during those months. They answered questions about what it means to be a CHW and the challenges they face. They shared stories about their role, such as educating pregnant women and children under one year old and emphasised the importance of being a role model and maintaining a commitment to the community. For instance, Image 1 shows María at her

first community meeting, where she used posters to explain program content and present the various materials provided. In Image 2, Mariposita can be seen using the poster "Signs of Danger During Pregnancy", explaining its content to a pregnant woman. These experiences of community sharing and teaching were highly satisfying, generating feelings of empowerment and strengthening participants' knowledge and communication skills.

Image 2. Photo of community engagement provided by Mariposita from Flor de Agosto.

Additionally, specific challenges were identified dur-ing the workshop, including limited phone signal resulting in poor communication in emergencies, difficulty adapting to tablet use, and concerns that families might not follow the provided recommendations. Despite these difficulties, participants expressed feelings of pride and satisfaction at achieving milestones such as encouraging pregnant women to visit the health centre, learning to use the tablet and experiencing joy when receiving appreciation from their communities. This has motivated them to continue in their role. They also shared stories about the emotional challenges of raising awareness in the community, as they sometimes encounter rejection and negative responses from certain individuals. The agents shared how patience and program supports have been essential in helping them to overcome these challenges. Initially, they expressed feelings of worry and sadness due to a lack of acceptance and trust from some families. However, over time and with practice, they developed a deeper connection to their role, which has given them energy and motivation. CHWs emphasised their strong sense of belonging to the program, feeling identified with and valued for wearing clothing and using materials that distinguish them as CHWs. Furthermore, some mentioned that community support and participation during visits brought them joy and satisfaction, especially when they observed families' interest in and commitment to following their recommendations. For example, Image 3 shows Picaflor teaching a family the step-by-step childbirth process, incorporating practices learned during program training. The photograph also shows the family's active participation in this process. In line with the thematic findings, some agents suggested providing food at meetings, as people are not always solely interested in receiving information. They emphasised that creating spaces for interaction and closeness strengthens community bonds and enriches their experience as agents.

Image 3. Photo of community engagement provided by Picaflor from Nuevo Peru.

DISCUSSION

This study engaged 10 Indigenous CHWs to explore their roles in program implementation, cultural inclusion, training translation, and emotion regulation. Using a hybrid coding approach, researchers identified four key themes: CHW roles, cultural practices, training and dissemination, and barriers. CHWs highlighted their commitment to serving pregnant women, children, and families through health education and support. They valued their role as community role models and reported improved skills and empowerment through real-time training between January and July.

The *Mamás de la Frontera* program implemented various strategies to empower CHWs. One of the core components of the program is the training process. Although some participants initially found this challenging, it helped CHWs recognise, acknowledge and manage emotions such as fear and worry. Through the activities included in the training sessions, and thanks to their commitment to their role and motivation to learn, the CHWs were able to overcome challenges that fostered feelings of empowerment. Another key factor in their empowerment is the work they do within their communities. During home visits, CHWs share their knowledge with pregnant women and their families, fostering positive relationships and facilitating the sharing of culturally relevant information. This recognition reinforces their sense of belonging to the program and encourages them to continue in their role. Additionally, the program focuses on developing and enhancing the communication skills of CHWs, enabling them to convey key health information effectively, build trust, and

strengthen their ties within the community.

The photo workshop identified the following five key themes in the experiences of CHWs: (1) role satisfaction and empowerment; (2) the challenges they face; (3) the emotional impact of community rejection; (4) their sense of belonging and recognition; and (5) proposals for improvement. Using photography facilitated open dialogue, promoting active listening and empathy for shared experiences, as well as providing an opportunity to verbalise their stories. These dynamics strengthened their sense of belonging to the program and the community, fostering greater confidence and empowerment in their role.

Similar findings were reported by Samsamshariat et al. (2023) in their study with CHWs in the Peruvian Amazon. The photovoice methodology enabled participants to share their experiences with both peers and policymakers, providing them with a platform to make their voices heard [44]. Similarly, Musoke et al. (2020) found that photographic documentation and group discussions among CHWs in rural Uganda encouraged reflection on their concerns and work-related challenges. These discussions also enabled critical dialogue, creating a safe space where CHWs could share their experiences and strengthen their collective identity [45].

In Guatemala, the National Reproductive Health Program aims to improve sexual and reproductive health, prioritising the reduction of maternal and neonatal mortality. Within this framework, traditional midwives play a vital role in Mayan communities, providing maternal care and working alongside the public health system. The program recognises and values Indigenous traditional medicine, promoting collaboration between midwives and institutional health services. It also empowers women to take on leadership roles within their communities and facilitates access to family planning and contraception services, particularly for adolescents and vulnerable groups. The program implements e-health tools such as telemedicine to improve the early detection of risks and ensure timely care in rural and hard-to-reach areas, strategies that are consistent with the current study.

Moreover, culturally informed, evidence-based home visiting program in Indigenous communities have been proven to promote health and well-being. The Family Spirit program, for example, is similar to the *Mamás de la Frontera* program in that it is designed to support Indigenous caregivers during pregnancy and early childhood. It is delivered by community-based health educators who teach families the skills and knowledge needed to promote their children's physical, cognitive, emotional, language and self-help development. The core curriculum comprises 65 lessons delivered from pregnancy until the age of three, with extensions up to the age of five and additional modules tailored to specific family needs. It was developed in 1995 by the Center for Indigenous Health at Johns Hopkins University in partnership with sovereign tribal nations, specifically the Navajo, White Mountain Apache and San Carlos Apache tribes. Since then, the program has expanded nationwide, serving 184 Indigenous and seven non-Indigenous communities, with technical support and training provided by community-based teams and research staff [47, 48]. The Family Spirit program has proven transformative and is an evidence-based model for addressing generational health inequities stemming from settler colonialism that can be adapted to diverse Indigenous contexts [49].

Notably, there has recently been a resurgence of traditional Indigenous birthing practices across Indigenous communities. Much like CHWs in the *Mamás de la Frontera* and *Mamás del Rio* program, Indigenous birth doulas are medical paraprofessionals who support pregnancy, childbirth and postpartum care. They prioritise cultural and advocacy elements in community health education and practice [7, 50]. Furthermore, in 2022, Doenmez and colleagues conducted a systematic review of Indigenous populations. Those who received doula support reported decreased pain and anxiety, shorter labour and fewer interventions (e.g. caesarean births) [51]. Doula and midwifery practices have long been practised in Indigenous communities and have been described as spiritual practices. In 2017, Corcoran and colleagues conducted a meta-synthesis reporting that midwifery care is particularly beneficial and effective for Indigenous women when services and programming are culturally grounded and developed with the community [53]. Indigenous birth justice efforts, as exemplified by the current study, are vital for the health and wellbeing of Indigenous caregivers, their children and their families.

This study makes valuable contributions to the field of community psychology. The experiences of CHWs demonstrate that active participation in culturally relevant programs strengthens individual capacities and fosters networks of mutual support, shared leadership and community resilience. These findings align with community psychology principles, which recognise active participation and empowerment as essential for collective well-being and sustainable change [57]. From this perspective, community members become social actors capable of critically reflecting on their reality, driving transformations and building well-being, in line with the critical and liberating vision that is characteristic of community psychology in Latin American contexts. Likewise, strengthening collective agency is essential for community development. In the present study, it was found that CHWs organise themselves and demand improvements in healthcare by sharing the same community interests. This strengthening, enhanced by training spaces and intercultural dialogue, contributes to building more cohesive communities with a greater capacity to influence decisions affecting their health and well-being [58].

As a theoretical and practical framework, interculturality is applied through community-based programming such as the current study. This approach empha-

sises the impact of social and structural inequities in healthcare systems [22]. Critical interculturality is a social, ethnic, political and epistemological approach that aims to transform and redistribute the conditions and mechanisms of power that perpetuate inequality, inferiority, racialisation and discrimination at the relational and structural levels. Functional approaches to interculturality acknowledge, value and engage with diverse cultures, supporting representation and community voice in proactive and constructive dialogue. Transformative approaches translate these functional steps into actionable measures that not only acknowledge, but also address shifts in social structures, institutions and dynamics, ranging from surface-level changes (e.g. cultural education and training) to systemic changes (e.g. policy reform), with the aim of better engaging with and supporting Indigenous communities. Moreover, interculturality is an ongoing, reflexive process involving multi-vocal dialogue and critical reflection, transcending Western notions of coexistence or assimilation into a dominant social order [59]. It is imperative to ground intercultural approaches in relationality and diverse ways of knowing and being, as well as in cultural continuity, in order to mitigate barriers to inclusive and holistic healthcare and expand access to it.

From this perspective, the sense of belonging expressed by CHWs through interviews and the photo workshop embodies the critical intercultural dimension of the program: their identification with both the community and the project strengthens collective agency. They interweave their learning from Western clinical and paraprofessional training with their own cultural and spiritual practices to generate solutions that are contextualised and culturally relevant, and which redistribute symbolic power within the health system. However, emerging tensions, such as the adoption of technology amid infrastructural limitations, gaps in digital literacy and initial emotional barriers, reveal the challenges of implementing an intercultural approach in contexts of structural inequity. Through constant practice and formative support, the CHWs have transformed fear into confidence, demonstrating that the appropriation of technology is also an emotional and empowering process. Their everyday work redefines the boundaries between technical knowledge and community experience. They use digital tools such as testimonial videos and visual posters to reinforce oral and narrative learning traditions. This enriches the intercultural framework by demonstrating how theory adapts, evolves and gains new meaning through practice.

Reclaiming Indigenous lifeways is crucial for promoting healthy development, identity formation, community health, community psychology and prevention science. Ultimately, this fosters generational healing among Indigenous peoples. The literature asserts that reclaiming and returning to cultural practices, cultural connectedness and traditional knowledge-sharing are protective factors against adverse health outcomes and are central to addressing Indigenous-specific social determinants of health that inform holistic well-being [54, 55]. Therefore, moving away from harmful Western frameworks and Eurocentrism by providing community-based and community-led direct services and programming is integral to decolonial efforts that advance research strategies which are culturally inclusive and in alignment with Indigenous ways of knowing, revitalisation and self-determination throughout Latin America and South America [56].

Limitations

The current study has several inherent strengths. These include the intercultural parity of our facilitation and interview conduct, our hybrid coding and thematic analysis, and our participatory approach to the photo workshop. However, the methodological approach does limit the scope of the study. Participation was limited to 10 self-identified Indigenous CHWs serving their respective communities who participated in the *Mamás de la Frontera* program. The Indigenous populations included in this study are Kichwa, Murui, Yagua and Maijuna. The findings are reported in the context of ten communities along the Putumayo River, located within ten hours by boat of the district of San Antonio del Estrecho, at the border between Peru and Colombia. While the findings may be applicable to other Indigenous communities, they cannot be generalised to all Indigenous populations in the Amazonian region.

It is important to consider the relationship between the researchers and the participants, since members of the research team conducted and facilitated the interviews and the photo workshop. Their presence may have influenced the participants' levels of engagement. The validity of the study findings could have been strengthened through member-checking, an adaptable process in which data (e.g. raw data, transcripts, codes and themes) are presented to participants for feedback prior to further analysis or finalisation [60]. However, the integration of this additional analysis method was outside the scope of the current study due to the additional time it would require from participants, the limited availability of funds to provide transportation support and travel accommodation, and the need to consider the availability of CHWs and the research team. Future phases of these efforts will aim to integrate participatory validation strategies, taking into account the outlined limitations and potential bias, in order to further strengthen rigorous research protocols consistent with community-based research approaches.

Implications

Despite efforts to be culturally inclusive, the study found that CHWs felt the training materials did not fully integrate traditional knowledge. This is a key consideration for the *Mamás de la Frontera* program and Ministries of Health, as these findings should inform updates to training to facilitate authentic intercultural dialogue, ensuring the content is culturally relevant and thereby in-

creasing the effectiveness and relevance of programs. It is therefore recommended that future iterations, expansions and adaptations of the *Mamás de la Frontera* program explicitly integrate traditional knowledge into training materials, including relevant medicinal practices and cultural protocols. The incomplete integration of traditional knowledge reflects persistent colonial power structures and knowledge hierarchies. Strengthening cultural relevance is consistent with an intercultural approach. Decolonizing community work requires the application of these study results to empower Ministries of Health to question established systems, validate Indigenous knowledge and create holistic and sustainable strategies.

This study strengthens the efforts of organisations, social actors and movements that advocate for the rights of CHWs. In Peru, as in other South American countries, their work is predominantly voluntary and often goes unrecognised, despite their crucial role in reducing disparities in healthcare access. CHWs are essential to ensuring primary-level care, particularly in rural, remote and Indigenous communities, where they serve as a vital link between the health system and the population. In this context, the leadership of *Mamás del Río* and *Mamás de la Frontera*, alongside the study's Principal Investigator (MMB), spearheaded the introduction of Bills No. 09150/2024-CR, 10071/2024-CR, and 11081/2024-CR before the Peruvian Congress. Following formal testimony provided by MMB and a CHW leader, the Health Commission officially approved the bills. These bills are now moving through the legislative process, currently pending a vote by the Economic Commission. The proposals seek to formalise and strengthen the role of CHWs by fully integrating them into the healthv system, expanding their scope of work, recognising their ancestral knowledge, ensuring fair remuneration, providing appropriate equipment and guaranteeing social protection. The proposals also include providing community medical kits and developing skills through continuous training tailored to contexts with limited internet connectivity.

In order to implement intercultural co-creation in CHW training, the Ministry of Health can convene parity co-design committees comprising CHWs, knowledge-keepers, traditional midwives, Indigenous leaders, technical teams and academics under a formal mandate. These committees would co-develop bilingual, context-specific training curricula that incorporate local cases and community practices. They would also define assessment criteria that value both biomedical competencies and ancestral knowledge, achieved through intercultural dialogue. Implementation is accompanied by intercultural formative supervision (e.g. peer mentoring and joint visits by CHWs and health staff), micro-credentials awarded for each module completed, and low-data virtual teaching resources (e.g. printed guides and educational videos in local languages). All of these elements are integrated into a continuous improvement cycle, with indicators such as cultural relevance, message comprehension, trust and adherence being agreed upon with the community.

To support the translation of research findings into practice, we recommend that Ministries: (1) create CHW accreditation frameworks with competency profiles that include cultural knowledge; (2) institute remuneration (e.g. salary or stipend) alongside transport reimbursement, per diems and insurance/social protection; (3) provide standardised supplies and equipment (e.g. community medical kits, materials and phones/tablets with data) with scheduled replenishment; (4) establish career ladders and pathways (e.g. competency-based promotion and mentor roles); (5) formalise community participation in governance (e.g. local health committees). Policy instruments may include ministerial resolutions, intersectoral agreements and budget proposals. Monitoring should rely on process and outcome indicators (e.g. CHW retention, certified training hours, supply availability, community satisfaction, service utilisation and care continuity), disaggregated by region, territory and Indigenous community.

The findings further amplify the voices and perspectives of Indigenous populations in South America, contributing to the lack of empirical literature on international Indigenous research collaboration beyond Western conventions. The implications of these efforts will inform program evaluation, improve educational and training materials, and support policy reform to promote the integration of CHWs and other health paraprofessionals into broader health systems. Future research could examine intercultural co-design mechanisms and conduct longitudinal impact evaluations, particularly in rural Indigenous contexts.

Conclusion

This qualitative study provides evidence of the experiences of CHWs who participated in the *Mamás de la Frontera* program, highlighting their experiences of implementing the program in borderland and Amazonian contexts. The findings show that the program promoted empowerment and the development of communication skills, strengthening the CHWs' community roles and positioning them as key figures in promoting maternal and child health within their communities. Participants also experienced a positive emotional impact, reflected in a heightened sense of purpose, pride, and connection to their work. Many participants experienced personal growth by overcoming situations that had initially caused them fear or insecurity, such as public speaking or using new technologies. This ultimately reinforced their empowerment and motivation to continue supporting other women and families in their communities.

However, the current study also reveals important tensions between the design of the training materials and sessions provided by the program and the CHWs' traditional knowledge. Despite efforts at cultural adaptation, including first-person storytelling by community

members, participants expressed a need for deeper intercultural dialogue to facilitate the effective integration of their ancestral knowledge. This gap highlights the importance of strengthening co-creation processes for content and training strategies that acknowledge and value traditional knowledge, thereby enhancing the relevance, sustainability and community ownership of interventions. The findings reaffirm that community health programs with Indigenous populations must be designed and implemented from an intercultural perspective, in close collaboration with the communities and their knowledge systems. By centering Indigenous CHWs as agents of decolonial practice, the current study highlights the importance of culturally grounded and community-based health strategies in fostering empowerment, amplifying ancestral knowledge and improving neonatal outcomes in underserved regions in the Peruvian Amazon.

DECLARATIONS

AI utilization
Not applicable.

Competing interests
All authors report no conflict of interest.

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Author contributions
Rita Orihuela-Anaya: Conceptualization, Methodology, Formal analysis, Investigation, Resources, Writing - Original Draft, Writing - Review & Editing, Visualization, Project administration, Funding acquisition. Meenakshi Richardson: Methodology, Formal analysis, Investigation, Resources, Writing - Original Draft, Writing - Review & Editing, Visualization, Project administration. Angela Alva: Resources, Writing - Review & Editing. Gladys Gamarra: Conceptualization, Methodology, Funding acquisition. Hernán Lauracio Ticona: Resources, Funding acquisition. Carlos Arosquipa Rodriguez: Writing - Review & Editing, Funding acquisition. Magaly Blas: Conceptualization, Investigation, Writing - Review & Editing, Supervision, Project administration, Funding acquisition. All authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Data availability
Not applicable.

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ABSTRACT IN SPANISH

Mamás de la Frontera: Perspectivas de empoderamiento de agentes de salud comunitarios Indígenas a lo largo del río Putumayo en la Amazonía peruana

Introducción: Los pueblos Indígenas en el Perú han experimentado importantes desigualdades en salud y bienestar social como consecuencia de un colonialismo persistente. A pesar de los avances significativos en salud materna y neonatal, las desigualdades regionales continúan. En respuesta a estos desafíos, el programa Mamás de la Frontera se desarrolló en colaboración con comunidades Indígenas de la Amazonía peruana. El programa incluyó la formación y el fortalecimiento del rol de agentes de salud comunitarios (ASC) para mejorar la atención materna e infantil de manera culturalmente pertinente. Este estudio se centra en las experiencias de los ASC durante la transición desde la formación hacia la práctica comunitaria.
Métodos: Se entrevistó de manera individual y semiestructurada a diez ASC de comunidades participantes cercanas al distrito de San Antonio del Estrecho. Las transcripciones fueron analizadas mediante una codificación cualitativa híbrida, integrando enfoques inductivos y deductivos del análisis temático. Además, los ASC participaron en un taller diseñado para recoger sus experiencias y expectativas en relación con la formación del programa, sus roles y la aplicación directa de los servicios en la comunidad.
Resultados: El análisis temático identificó cuatro temas principales: (1) roles y responsabilidades, (2) prácticas culturales, (3) formación, traducción y difusión, y (4) barreras y necesidades experimentadas por los ASC. Cada tema incluyó subtemas que aportan mayor detalle y especificidad. El taller fotográfico complementó los hallazgos cualitativos formalizados, resaltando aún más las percepciones y opiniones de los ASC sobre aspectos como la satisfacción con su rol, las dinámicas comunitarias y el sentido de pertenencia.
Conclusiones: Los hallazgos refuerzan la evidencia empírica existente sobre las experiencias de los ASC Indígenas, destacando elementos clave de la implementación del programa y la adaptación de la prestación de servicios de salud en contextos rurales amazónicos. Los ASC desempeñan un papel fundamental en la promoción de la salud materna e infantil y del bienestar comunitario. Las implicancias de este estudio apuntan a seguir fortaleciendo programas de salud comunitaria culturalmente integradores y basados en fortalezas, así como estrategias de prevención, incidencia, desarrollo de recursos y reforma de los sistemas de salud, con el objetivo de apoyar mejor a las poblaciones Indígenas del Perú.

Palabras clave: Indígenas, agentes de salud comunitarios, materna, infantil, prevención, Amazonía, Perú.

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