Journal of Immigrant and Minority Health (2025) 27:778–786
https://doi.org/10.1007/s10903-025-01732-8

ORIGINAL PAPER

Training to Act (*Formar para Actuar*): Peer-to-Peer Education to Promote Health Among Vulnerable Immigrant Women in Barcelona (Spain)

H. Ouaarab-Essadek[1] · M. Fornaguera[2] · M. Navarro[1] · A. Salomón[1] · P. Peremiquel-Trillas[3,4,5] · J. Gómez i Prat[1]

Accepted: 22 June 2025 / Published online: 7 July 2025

Abstract

"*Formar para actuar*" (FxA; "*Training to act*") is an innovative peer-to-peer educational program that employs a training-action model with a gender and intercultural perspective. The program aims to enhance knowledge and empower immigrant women to advocate for health promotion within their communities. This study assesses FxA program's impact on knowledge acquisition and participant satisfaction. Conducted across four FxA editions (2018, 2020, 2021, 2022), this before-and-after intervention study evaluates a structured two-module approach implemented consecutively in each edition. In Module 1 (Training), migrant women with leadership and community ties attended 12 h of training led by healthcare professionals, covering sexual and reproductive health and communication strategies. Those identifying a peer group advanced to Module 2 (Action), acting as peer educators and leading workshops. Self-reported questionnaires covering sociodemographics, knowledge and satisfaction, were collected from both peer educators and participants. Knowledge impact comparisons before and after the intervention were performed using paired t-tests. Module 1 of the FxA program trained 29 migrant women as peer educators; 20 continued in Module 2, delivering workshops to 166 participants who faced higher vulnerability levels, including language barriers, fewer years in Europe, and lower educational levels. The study revealed significant knowledge improvements, particularly among women participants. Overall satisfaction was high. This study highlights the program's effectiveness in transmitting health promotion messages within vulnerable environments by training immigrant women as peer educators. The findings provide valuable insights to implement the program in other regions and further reinforce its application in public health programs.

Keywords Health promotion · Peer-education · Community participation · Vulnerable populations · Sexually transmitted diseases · Immigrants

H. Ouaarab-Essadek, M. Fornaguera Contributed equally to this work and share first authorship.

✉ J. Gómez i Prat
jordi.gomez@vallhebron.cat

[1] Community & Public Health Team (ESPIC), Drassanes-Vall d'Hebron International Health Unit and Infectious Diseases, Institut Català de la Salut, Av. de les Drassanes, 17-21, Barcelona, Catalonia 08001, Spain

[2] Preventive Medicine and Epidemiology Department, Vall d'Hebron University Hospital, Barcelona, Spain

[3] Cancer Epidemiology Research Programme, Catalan Institute of Oncology, Barcelona, Spain

[4] Bellvitge Biomedical Research Institute - IDIBELL, Barcelona, Spain

[5] Consortium for Biomedical Research in Epidemiology and Public Health - CIBERESP, Carlos III Institute of Health, Madrid, Spain

Introduction

Since 2000, Catalonia has experienced a continuous significant increase in its immigrant population, which accounted for over 17% of its total population in 2022. Barcelona is the major city in the Catalonian region, with a total of 1.68 million of population living, among those, 414.063 (24%) are migrants, specifically 203.893 (49% among those migrants) are women [1]. Initially, migratory movements predominantly involved men, but over the last decade, the number of female migrants has surpassed the number of men [2]. This trend of feminization in immigration has led to notable changes in health indicators. Data from the Health Survey of Catalonia highlights that there are evident disparities in several health indicators and self-perceived health between immigrants and the native population, considering both gender and social class [3–5].

The scientific literature has consistently demonstrated that the health of immigrant populations is at risk due to the existence of multiple barriers. In this sense, the most vulnerable groups face numerous barriers preventing their participation, including a lack of awareness and limited access to resources needed to engage in these programs [6]. The Geneva Well-being Charter on Health Promotion [7] also highlighted the urgency of achieving equitable health, which demands focusing health promotion models on empowering, inclusion, equity, participation, and meaningful learning for the population. The classic model of the social determinants of health by Dahlgren and Whitehead [8, 9], evidences that social and community networks influence lifestyle. These networks play a pivotal role for socially vulnerable populations, highlighting the importance of identifying proactive individuals and empowering them to serve as catalysts for positive change in promoting health among their peers [10].

Multiple studies have highlighted the need to integrate a gender perspective to mitigate these vulnerabilities and address health disparities effectively, specifically targeting interventions towards those women who require greater support due to their low labor market participation and social isolation within their households [11]. Simply relying on the intervention of health professionals to educate these women is insufficient, and there is a need for more effective strategies to engage and support these women [12].

Peer or peer-to-peer education is based on a horizontal model of communication that highlights the importance of community involvement in the educational process [13]. It has demonstrated successful outcomes across diverse areas such as infectious diseases [14, 15], nutrition education [16], substance abuse [17], and self-care for cancer patients [18], among others. Despite the proven health benefits and positive results associated with the peer education model within particular contexts and specific groups, Spain currently lacks comprehensive programs that empower these women to become peer educators and promote health among other women within their communities [15, 19].

In Barcelona, the Public and Community Health Team (ESPIC) of the Drassanes - Vall d'Hebron International Health Unit (USIDVH), in collaboration with various civil society organizations, has been implementing "Formar para actuar" program (FxA) since 2018. FxA is an outreach and citizen participation program based on peer education and meaningful learning for health promotion from a gender and intercultural perspective [20]. This program adopts a dynamic training-action approach based on peer education and incorporates a gender perspective. Its objective is to empower immigrant women at the community level as peer educators in health promotion, particularly in the field of sexual and reproductive health, including sexually transmitted infections, enabling them to effectively transmit knowledge to other women in the community—especially those who are typically not reached through traditional services or channels—within the spaces where they carry out their daily activities.

The FxA program is carried out through a course that alternates modules of theoretical training (training module) with practical actions, involving the transfer of acquired knowledge to the community setting (action module), working with other immigrant women in different meeting spaces. It utilizes various educational tools that have been co-created through participatory research in collaboration with vulnerable immigrant groups and validated as pedagogical support (www.espictools.cat) [21].

This study aims to comprehensively describe and assess the effectiveness of FxA in enhancing knowledge, thereby demonstrating its practical utility and providing insights to guide its further implementation. Our hypothesis is that the FxA program improves knowledge levels among both immigrant peer educators and workshop participants, particularly those who are typically not effectively reached through traditional services or channels.

Methods

Study Design

This study presents a descriptive and analytical overview of the implementation of the FxA program across four editions. FxA is a community-based intervention based on peer-to-peer education addressed to immigrant women, using a before-and-after design.

Description of the Intervention and Participants

The study population comprises participants from the four FxA editions held in 2018, 2020, 2021 and 2022. The FxA program is structured into two modules, implemented consecutively in each edition:

Module 1 - Training

Through collaboration with civil society organizations working with immigrant women in Barcelona, were the ESPIC team is based, the program was promoted, and women were recruited for the training. Personal interviews were conducted to select women who met the inclusion criteria: adult women of immigrant origin, proficient in Spanish, communicative abilities, leadership and contact within their community. The selected women underwent 12 h of training distributed over three sessions of four hours in length, delivered by healthcare professionals (doctors and nurses) from the ESPiC team. The training was structured as participatory sessions with group dynamics grounded in meaningful learning. They covered concepts of sexual health and certain infectious sexually transmitted infections (STIs), such as viral hepatitis or human immunodeficiency virus (HIV) through pedagogic tools (HEPARJOC, SIDAJOC, CONTRACEPTION vs. STI PREVENTION METHODS). Also, guidance was provided to improve their communication skills and interaction with others.

Module 2 - Action

From the group of peer educators instructed in Module 1, those most motivated and who actively identified a peer group were selected to conduct a workshop in their respective community spaces. Before the workshop, an ESPiC team member conducted a review and consolidation session of the theoretical concepts covered in the training with these women. Peer educators who were selected (from now on, 'Active peer educators') then organized and conducted workshops in various settings (private homes, cultural and community centres, women's associations, religious centres…) with vulnerable immigrant women within their communities. Each workshop lasted 1–2 h per group and utilized one of the tools taught during the training. The active peer educators led the workshops, with a nurse from eSPiC present as an observer.

Questionnaires and Data Collection

The same three questionnaires (sociodemographic, knowledge, and satisfaction) were collected from peer educators and workshop participants in both modules of the program. The questionnaires were in Spanish, self-reported and collected on paper.

The languages used for the entire training of peer educators in Module 1 were Catalan and/or Spanish, as all participants had proficiency in these languages. The workshops conducted in Module 2 were held in the language of the respective community to which the peer educator belonged. These languages included Spanish, Romanian, Urdu, Wolof, and Arabic.In most cases where language barriers existed, there were also literacy challenges. Consequently, the community health agent from the ESPiC team provided oral translation and assisted participants in completing the questionnaires. Additionally, in Module 2, reinforcement sessions were conducted for peer educators to standardize translations and interpretations into these languages, thereby minimizing variations in oral translation during the workshops.

Knowledge was assessed before and after the intervention using specific structured questionnaires for each educational tool, and the same questionnaire was collected before and after the intervention (Supplementary Appendix 1). These questionnaires consisted of 8 to 20 questions, mainly dichotomous, related to disease/infection characteristics, etiology, transmission, prevention, and treatment (Supplementary Appendix 1). The satisfaction of the workshop facilitators and the participants was measured using structured questionnaires (Supplementary Appendix 2).

Statistical Analysis

For descriptive analysis, proportions with 95% confidence intervals (CI) were used for qualitative variables, while measures of central tendency (mean) and dispersion (interquartile range) were used for quantitative variables. Sociodemographic characteristics among peer educators and participants were assessed using Fisher's exact test or a non-parametric median test, as appropriate.

Only correct responses were scored positively to assess knowledge improvement after the intervention while missing and incorrect responses were not scored. The percentage of correct answers was calculated by adjusting the number of answers in each questionnaire. The comparison of the percentage of correct responses between before-and-after questionnaires was performed using paired t-tests. All probabilities were two-tailed, and p-values < 0.05 were considered statistically significant. The analysis was conducted using R Studio software [22].

Ethical Considerations

The study followed the standards established in the Declaration of Helsinki and obtained approval from the Clinical

Research Ethics Committee of the Vall d'Hebron University Hospital (PR(AG)273/2023). Before involvement, all participants received detailed information regarding the study and its procedures and were informed about the confidentiality of their responses. Each participant willingly to participate gave informed consent. No data containing personal or identifying information from the participants has been published.

Results

In the overall assessment of the four FxA editions, a total of 29 women underwent training in Module 1 (instructed peer educators), of whom 20 actively engaged in Module 2 (active peer educators), encompassing a broader cohort of 166 women participating in the workshops (workshop participants). The distribution of participants varied across the four editions, with 2018 edition exhibiting the highest involvement, with 94 participants (48%).

Seventeen associations dedicated to women and immigration were actively involved in the study: four in 2018, three in 2020, four in 2021, and six in 2022. These associations played a crucial role, referring a significant portion of women to training (59%) and providing spaces to conduct workshops within the community.

Demographic Characteristics

Sociodemographic characteristics of participants, both Module 1 and Module 2, are detailed in Table 1. Notably, among Module 2 participants, statistically significant differences emerge between active peer educators and workshop participants across all studied variables, excluding age and country of origin. It is worth highlighting that women born in Southern Asia and Northern Africa were the highest represented, especially those from Bangladesh, Morocco, and Pakistan (28%, 17%, and 14% respectively). All active peer educators had secondary or higher education and did not encounter any language barriers. In contrast, lower educational levels among workshop participants and language barriers were observed amongst more than half of the participants (56%). The average length of stay in Spain was notably longer among active peer educators than workshop participants (15.9 years vs. 8.5 years, respectively). Differences among both groups concerning the reason of migration as well as the employment status were also observed. Notably, 60% of the peer educators were involved in civil society associations, whereas this collaboration diminished to 17% among women participating in the workshops. The place of residence (city, neighbourhood) of the instructed peer educators and workshop participants were similar, highlighting the existing social networks within the communities (Data not shown).

Knowledge Assessment

The knowledge evaluation before and after the intervention with the three educational tools is shown in Table 2. All instructed peer educators and 99% (165/166) of workshop participants completed both knowledge surveys. A statistically significant difference is observed between the before and after assessments for all evaluated knowledge domains and both instructed peer educators and workshop participants (Table 2).

In the pre-intervention knowledge questionnaire, workshop participants showed a lower percentage of correct responses, with the lowest result being 24% of correct responses in the concepts related to methods for preventing STI. Conversely, instructed peer educators demonstrated higher pre-intervention knowledge outcomes, with the highest result reaching 81% in the knowledge concerning viral hepatitis but showing the lowest knowledge levels regarding STI prevention methods, with 51% of correct answers. In the post-intervention knowledge questionnaire, instructed peer educators showed more favourable results than workshop participants, achieving 99% correct responses for viral hepatitis, 97% for STI prevention, 92% for contraception methods and 88% for HIV. The mean difference in the percentage of correct responses before and after intervention, reached higher values in the case of STI prevention and contraception methods in both groups of participants (68% and 50% in the case of workshop participants, respectively, and 46% and 28% in the case of instructed peer educators). Notably, workshop participants knowledge reached 99% correct answers after the intervention with HEPARJOC, the same level as instructed peer educators, allowing an increase of knowledge of 48%, as shown in Table 2.

Satisfaction Assessment

Regarding satisfaction with the program, all participants completed the satisfaction surveys. The instructed peer educators reported excellent satisfaction levels (9.9/10) across the different aspects of the course, including course presenters, the relevance of topics, materials used, the level of knowledge acquired, as well as the course duration, organization, and schedules (Supplementary Appendix 3). All active peer educators valued the experience positively and expressed a desire to participate in it again. Workshop participants also showed an excellent level of satisfaction, with 95.7% rating the maximum score [5] on a scale from 1 to 5). Additionally, all participants expressed their interest in

Table 1 Sociodemographic characteristics of the participants in training/action module

Type of participants	Module 1: Training	Module 2: Action			
	Instructed peer educators	Active peer educators	Workshop participants	Total Module 2	*p-value***
N	29	20	166	186	
Age Mean (Q25 - Q75)	40.0 (33.0–46.0)	40.2 (33.0–46.5)	36 (28.0–43.0)	36.5 (28.0–43.8)	*0.08*
Age categories					*0.3*
<35 years	8 (28%)	6 (30%)	77 (46%)	83 (44%)	
35–44 years	9 (31%)	7 (35%)	53 (32%)	60 (32%)	
≥45 years	12 (41%)	7 (35%)	36 (22%)	43 (23%)	
Region of birth*					*0.5*
Western/Middle Africa	8 (28%)	6 (30%)	28 (17%)	34 (18.3%)	
Northern Africa	5(17%)	4 (20%)	33 (20%)	37 (19.9%)	
Eastern Europa	3(10,3%)	1 (5%)	5 (3%)	6 (3.2%)	
Central/South America	4 (13,7%)	2 (10%)	13 (8%)	15 (8%)	
Southern Asia	9(31%)	7 (35%)	87 (52%)	94 (50.6%)	
Level of studies					*0.011*
No studies	0 (0%)	0 (0%)	11 (6.6%)	11 (5.9%)	
Primary education	1 (3.4%)	0 (0%)	29 (17%)	29 (16%)	
Secondary education	14 (48%)	10 (50%)	89 (54%)	99 (53%)	
University studies	14 (48%)	14 (50%)	37 (22%)	47 (25%)	
Language barrier					*< 0.001*
Yes	0 (0%)	0 (0%)	93 (56%)	93 (50%)	
No	29 (100%)	20 (100%)	73 (44%)	93 (50%)	
Length of residence in Spain (years) Mean (25p -75p)	14.9 (8.0–22.0)	15.1 (7.8–22.3)	8.5 (3.0–13.0)	9.4 (3.0–15.0)	*< 0.001*
Length of residence in Spain					*0.002*
≤2 years	2 (6.9%)	0 (0%)	33 (20%)	36 (18%)	
3–5 years	3 (10%)	3 (15%)	43 (26%)	46 (23%)	
6–10 years	4 (14%)	4 (20%)	35 (21%)	39 (20%)	
>10 years	20 (69%)	13 (65%)	55 (33%)	75 (38%)	
Reason of migration					*0.04*
Economic / work	11 (38%)	7(35%)	26 (16%)	33 (18%)	
Studies	4 (14%)	3 (15%)	6 (3.6%)	9 (4.8%)	
Family reunification	11 (38%)	9 (45%)	128 (77%)	137 (74%)	
Political	0 (0%)	0 (0%)	3 (1.8%)	3 (1.6%)	
Other	3 (10%)	1 (5%)	3 (1.8%)	4 (2.2%)	
Employment situation					*< 0.001*
Continuous work	9 (31%)	7 (35%)	23 (14%)	30 (16%)	
Discontinuous work	6 (21%)	3 (15%)	19 (11%)	22 (12%)	
Housewife	0 (0%)	0 (0%)	62 (37%)	62 (33%)	
Unemployed	14 (48%)	10 (50%)	39 (23%)	49 (26%)	
Unknown	0 (0%)	0 (0%)	23 (14%)	23 (12%)	
Type of residence in Spain					*0.03*
Own housing	1 (3.4%)	1 (5%)	2 (1.2%)	3 (1.6%)	
Family/friends' housing	24 (83%)	17 (85%)	158 (95%)	175 (94%)	
Shelter housing	1 (3.4%)	1 (5%)	2 (1.2%)	3 (1.6%)	
Occupied housing	1 (3.4%)	0(0%)	2 (1.2%)	2 (1.1%)	
Other	2 (6.9%)	1 (5%)	2 (1.2%)	3 (1.6%)	

Table 1 (continued)

Type of participants	Module 1: Training	Module 2: Action			
	Instructed peer educators	Active peer educators	Workshop participants	Total Module 2	*p-value***
Collaboration with a migrant association					*< 0.001*
	17 (59%)	12 (60%)	29 (17%)	41(22%)	

* According to Standard country or area codes for statistical use proposed by the United Nations (https://unstats.un.org/unsd/methodology/m49/). Countries included in each region are: **Central / South America**: Salvador, Honduras, Bolivia, Colombia, Ecuador, Paraguay. **Eastern Europe**: Rumania, Rusia. **Northern Africa**: Argelia, Egypt, Morocco. **Southern Asia**: Bangladesh, India, Pakistan. **Western/ Middle Africa**: Gambia, Nigeria, Senegal, Guinea Ecuatorial

** p-value was calculated comparing instructed peer educators to Workshop Participants; Kruskal-Wallis rank sum test, Fisher's exact test, Wilcoxon rank sum test, Pearson's Chi-squared test, according to the type of data

engaging in similar activities on different topics (Supplementary Appendix 3).

Discussion

This article outlines and assesses an innovative and pioneering health promotion strategy in the field of community health aimed at migrant women in Europe. Through peer-to-peer education and tools developed through collaborative creation processes, this strategy enhances the health literacy of immigrant women living in vulnerable areas of Barcelona. This work is based on over a decade of experience, during which the approach to peer-education training and subsequent actions have been carefully deliberated and improved over time. The close collaboration with various immigrant associations has been instrumental in effectively implementing this strategy.

One of the most significant outcomes of this study is the successful integration of health into the agendas of migrant associations, positioning it at the forefront of health promotion efforts. The involvement of these associations has grown over the editions (4 in 2018, 6 in 2022). Additionally, these associations contributed to 59% of participants attending the Peer Educator training (Module 1) and provided their facilities, resources, and community networks to conduct the workshops during the action phase (Module 2). This involvement of the associations was possible thanks to the participatory pedagogical tools used. The ongoing use of these tools within their respective environments, even beyond the program's annual editions, enhances the sustainability of health promotion messaging. The findings presented are consistent with existing research emphasizing the importance of involving associations or social entities, wherein peer educators facilitate the integration of these communities by fostering a sense of belonging and community integration [23–25].

The sociodemographic profile of the participants reveals differences between the Peer Educators and the workshop participants. These differences were expected, given the distinct profiles of the women involved in each module. In Module 1, women were already active in their communities and demostrated leadership traits, a key criterion for their selection. In contrast, workshops participants were selected by peer educators from within their communities, which made them harder to reach. Thus, we observe that the academic level of Peer Educators is high, with half of them having university studies and the rest, secondary education. In terms of origin, there is a notable prevalence of participants women in both groups, peer educators and workshop participants, from Bangladesh, Morocco, and Pakistan, aligning with the countries boasting the largest resident populations in Barcelona [1], particularly in vulnerable areas like the Ciutat Vella district. On the contrary, when considering the workshop participants, a socioeconomically vulnerable profile emerges. Many of them faced a language barrier (56%), the majority (77%) migrated for family reunification reasons, have spent fewer years in Europe. Those women predominantly possess medium or low educational levels, domestic workers were significantly represented within this group, and showed a limited affiliation within any migrant association. Although comparing with other similar studies is challenging due to the unique characteristics of each program, the broader scientific literature indicates comparable characteristics of peer educators to other peer education initiatives in other regions [26], especially whether the focus is on health promotion or chronic care management, as evidenced by programs like the "Expert patient program" [27].

Regarding the changes identified concerning the knowledge acquired during training or community workshops, there is noticeable improvement in knowledge and a high level of satisfaction among both groups, peer educators and workshop participants. These results recognize the peer educators' role and their capacity to promote health messages effectively in diverse community settings [19, 28]. These findings are consistent with similar studies conducted in vulnerable contexts [29]. Another important aspect highlighted by our study is the significant impact of actively

Table 2 Participants' knowledge enhancement before and after the intervention

Educational tool	Knowledge assessment	Instructed peer educators (Module 1)						Workshop participants (Module 2)					
		N	Before	After	Mean dif.	CI 95%	*p*-value*	*N*	Before	After	Mean dif.	CI 95%	*p*-value*
HEPARJOC	Viral hepatitis	21	81%	99%	18%	10 – 26%	*< 0.01*	76	51%	99%	48%	41 – 56%	*< 0.01*
SIDAJOC	HIV	8	69%	88%	18%	2–36%	*0.05*	14	52%	80%	28%	17–40%	*< 0.01*
Contraception vs. STI prevention methods	STI prevention	8	51%	97%	46%	18–73%	*< 0.01*	75	24%	93%	68%	61–75%	*< 0.01*
	Contraception	8	64%	92%	28%	8–47%	*0.01*	75	36%	85%	50%	42–55%	*< 0.01*

CI: Confidence interval; HIV: human immunodeficiency virus; STI: Sexually transmitted infection

The p-value was calculated by comparing the results obtained before and after the intervention in each group using a paired t-test

trained peer educators in disseminating acquired knowledge to various groups of immigrant women within the community, many of whom live in vulnerable neighbourhoods. It is noteworthy that these 20 active peer educators successfully conveyed messages about sexual health to a total of 166 workshop participants across various community settings, particularly within Barcelona's Ciutat Vella district, known for its challenging low health-related outcomes [30]. This underscores the influential role of peer educators, leveraging their proximity, recognition, and influence to effectively disseminate health promotion efforts among their peers, especially in socially vulnerable contexts [31–33].

It is important to mention some limitations our study presented. Firstly, the COVID-19 pandemic substantially curtailed program participation, particularly evident during the years 2020 and 2021. Secondly, the biases inherent in the pre-post methodological design significantly impact the evaluation of knowledge improvement and have been meticulously considered for the prudent interpretation of results. Specifically, historical bias complicated the exclusion of concurrent events that may have influenced the observed outcomes, while testing bias introduces the potential for altered scoring due to exposure to assessments. Additionally, there may be an assisted response bias, as women facing language barriers received assistance from ESPiC team members and/or peer educators when completing the questionnaire, which could condition their responses in the questionnaires and potentially lead to an overestimation of correct answers. Regarding the limitations of the intervention itself, a difficulty that has been addressed over the years is the positioning of the instructor in the context of peer education and interculturality. The instructors involved need to be competent in conveying theoretical and practical content in a rigorous yet simple manner, allowing for its transfer to the community setting by the peer educators. This requires significant coordination and, above all, supervision of the practical periods. Finally, it is important to highlight that the associations have had difficulties in maintaining the continuity of the actions of the peer educators. For this reason, it is crucial to promote the continuation of these actions, given their usefulness, with some type of incentive at the individual level and recognition for the associations that support them.

Conclusion

Our study findings suggest that the FxA program, grounded in peer-to-peer education within vulnerable urban environments, effectively enhances knowledge and disseminates health promotion messages among vulnerable immigrant women which are difficult to reach due to their low

participation in the labour market and social isolation. These results underscore the importance of developing dynamic and participatory programs like FxA which can help mitigate these vulnerabilities in accessing health promotion programs.

Supplementary Information The online version contains supplementary material available at https://doi.org/10.1007/s10903-025-01732-8.

Acknowledgements We extend our gratitude to every association, community health agent and healthcare professional involved in this program. And, of course, to all the women who actively engaged in the workshops and spearheaded interventions to enhance health literacy within their communities.

Author Contributions Conceptualization: Hakima Ouaarab-Essadek, Mar Fornaguera, Paula Peremiquel-Trillas, Jordi Gómez i Prat; Methodology: Hakima Ouaarab-Essadek, Mar Fornaguera, Paula Peremiquel-Trillas, Jordi Gómez i Prat; Data collection: Hakima Ouaarab-Essadek, Apolonia Salomón, Jordi Gómez i Prat; Formal analysis: Mar Fornaguera, Paula Peremiquel-Trilla; Investigation: Hakima Ouaarab-Essadek, Mar Fornaguera. Marta Navarro, Paula Peremiquel-Trillas, Jordi Gómez i Prat; Writing - original draft preparation: Hakima Ouaarab-Essadek, Mar Fornaguera; Writing - review and editing: Hakima Ouaarab-Essadek, Mar Fornaguera. Marta Navarro, Apolonia Salomón, Paula Peremiquel-Trillas, Jordi Gómez i Prat; Supervision and project administration: Hakima Ouaarab-Essadek, Jordi Gómez i Prat.

Competing interests Authors have no competing interests to declare.

References

1. Instituto de Estadística de Cataluña. Municipal register of inhabitants [Internet]. Available from: https://www.idescat.cat/indicadors/?id=basics
2. de Igualdad M. Gobierno de España. Migrant women [Internet]. Available from: https://www.inmujeres.gob.es/areasTematicas/multiDiscriminacion/mujeresMigrantes/home.htm
3. Generalitat de Cataluña. Observatorio del Sistema de Salud de Cataluña. Open data [Internet]. Avaliable from: https://observatorisalut.gencat.cat/es/observatori-desigualtats-salut/dades_obertes/
4. Observatorio de Salud de la Mujer. Social inequalities in health, lifestyles, and the use of health services in the autonomous communities, 1993–2003. Madrid: General Directorate of the Quality Agency of the National Health System; 2006.
5. Nielsen SS, Krasnik A. Poorer self-perceived health among migrants and ethnic minorities versus the majority population in europe: a systematic review. Int J Public Health. 2010;55:357–71.
6. Ramos A. Desigualdades en salud e inequidades en el acceso a los sistemas sanitarios públicos. Los colectivos socialmente desfavorecidos en Barcelona [Doctoral dissertation]. 2008.
7. World Health Organization. The Geneva charter for Well-being. Geneva: WHO; 2021.
8. Dahlgren G, Whitehead M. Policies and strategies to promote social equity in health. Stockholm, Sweden: Institute for Futures Studies; 1991.
9. Dahlgren G, Whitehead M. The Dahlgren-Whitehead model of health determinants: 30 years on and still chasing rainbows. Public Health. 2021;199:20–4.
10. Escartín P, López Ruiz V, Ruiz-Jiménez JL. La participación comunitaria En Salud. Comunidad. 2015;17:16.
11. de Sanidad M. Servicios Sociales e Igualdad. Comisión para Reducir las Desigualdades Sociales en Salud en España. Avanzando hacia la equidad. Propuestas de políticas e intervenciones para reducir las desigualdades sociales en salud en España. 2015.
12. Agudelo-Suárez AA, Gil-González D, Vives-Cases C, et al. A metasynthesis of qualitative studies regarding opinions and perceptions about barriers and determinants of health services accessibility in economic migrants. BMC Health Serv Res. 2012;1:2.
13. Conant B, Zimmer CG. The power of peer health education. J Am Coll Health. 1993;41(6):241–5.
14. Estrada JH, Escobar DN, Briceño JE. Educación de Pares Como estrategia de prevención de La infección Por El VIH En adolescentes: referentes Teóricos y metodológicos. Rev Gerenc Polit Salud. 2011;10(20):46–66.
15. Mazarrasa L, Blázquez MI, Martínez M, et al. Promoción de La Salud En Población inmigrante: participación comunitaria y educación Entre Iguales. En: La prevención de La infección Del VIH-Sida En La Población inmigrante. Madrid: Secretaría del Plan Nacional de Sida, Ministerio de Sanidad y Consumo; 2006. pp. 79–81.
16. Pérez-Escamilla R, Hromi-Fiedler A, Vega-López S, et al. Impact of peer nutrition education on dietary behaviors and health outcomes among latinos: a systematic literature review. J Nutr Educ Behav. 2008 Jul-Aug;40(4):208–25.
17. Naciones Unidas. Inter pares utilización de las estrategias de comunicación inter pares para prevenir el uso indebido de drogas [Internet]. Avaliable from: https://www.unodc.org/pdf/youthnet/action/message/handbook_peer_spanish.pdf
18. Panader-Torres A, Cerinza-León K, Echavarría-Arévalo X, Pacheco-Hernández J, Hernández-Zambrano S. Experiencias de educación interpares Para Favorecer El autocuidado Del Paciente oncológico. Duazary. 2020;17(2):45–57.
19. Aviñó D, Paredes-Carbonella JJ, Pereió-Péreza R. Projecte RIU: Cambios percibidos Por agentes de Salud y profesionales Tras Una intervención En Salud En Un Barrio En situación de vulnerabilidad. AtenPrimaria. 2014;46(10):531–40.
20. Ausubel DP. Significado y Aprendizaje significativo. Psicología educativa. Un Punto de Vista cognoscitivo. México: Trillas; 1976.
21. Ouaarab Essadek H, Borrás Bermejo B, Caro Mendivelso J et al. HEPARJOC-ACTÚA: Herramienta educativa Creada a través de Un Proceso de investigación-acción participativa Con colectivos inmigrantes vulnerables Para mejorar La accesibilidad al Diagnóstico de La hepatitis B. Rev Esp Salud Pública. 2020;94.
22. RStudio Team. RStudio: Integrated Development for R, Boston. MA: RStudio, PBC; 2020. Avaliable from: https://www.rstudio.com/

23. Brach C, Fraser I. Can cultural competency reduce Racial and ethnic health disparities? A review and conceptual model. Med Care Res Rev. 2000;57(1sup):181–217.
24. Castro-Rojas L, Crisanto M, Martín-García A, et al. Salud En Nuestra agenda: Guía Para impulsar acciones comunitarias En Salud desde Las asociaciones. Valencia: Generalitat Valenciana; 2016.
25. Mena M, Pla M, Masip M. Análisis de Redes de mujeres Inmigradas En cataluña: papel de Las asociaciones En El Mantenimiento de Su Salud. Psico. 2007;38(2).
26. Ramos C, Sastre PM, Álvarez B et al. Puesta En Marcha Del proyecto agentes comunitarios de Salud En El Distrito de Villaverde de Madrid. Comunidad. 2018;20.
27. González A, Fabrellas N, Agramunt M, et al. De Paciente Pasivo a Paciente activo. Programa Paciente Experto Del Institut Català de LaSalut. Innovación Sanitaria Y Atención Integrada. 2008;1:1–3.
28. Balcazar H, Perez-Lizaur AB, Escalante E, et al. Community health Workers-Promotores de Salud in mexico: history and potential for Building effective community actions. J Ambul Care Manage. 2016;39(1):12–22.
29. Khosravi N, Kolifarhood G, Shoghli A, et al. Effectiveness of peer education approach on improving HIV/AIDS related healthy behaviors among immigrant street children: A randomized controlled trial. Clin Epidemiol Global Health. 2018;6(3):115–21.
30. Borrell C, Pasarin MI, Diez E et al. Las desigualdades En Salud Como prioridad política En Barcelona. Gac Sanit. 2019.
31. Essadek HO, Mendioroz J, Guiu IC, Barcelona Health Region Tuberculosis Prevention and Control Programme Working Group, et al. Community strategies to tackle tuberculosis according to the WHO region of origin of immigrant communities. Public Health Action. 2018;8(3):135–40.
32. Ruiz-Giménez JL, Benito LF. Guía de promoción de salud para agentes de salud comunitarios. Madrid: Instituto Madrileño de Salud. Área 1 Atención Primaria; 2003. 2. Avaliable in; http://egavilan.files.wordpress.com/2010/05/guia-de-promocion-de-salud.pdf
33. Giraudo N, Chiarpenello J. Educación Para La Salud Basada En La Comunidad. Evid Act Pract Ambul F. 2011;14(4):142–8. 48.