FACTORS INFLUENCING COMMUNITY COLLABORATION IN PUBLIC HEALTH INITIATIVES IN DEVELOPING COUNTRIES: A SYSTEMIZED REVIEW

by

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Abstract

Safe drinking water is a basic necessity that remains out of reach for many people living in developing countries. Rural regions of Latin America are the least likely to have access to clean drinking water resulting in high morbidity and mortality (UNICEF, 2014). The World Health Organization (2015) urges community collaboration to address issues related to unsafe drinking water. For the past 12 years ECU College of Nursing has been working with community partners in Guatemala to address safe drinking water. Yet, it is unclear what factors contribute to the effectiveness and sustainability of community collaboration in public health initiatives, such as safe drinking water.

A systemized review of the literature was conducted to ascertain the current state of the science of community collaboration in public health initiatives in developing counties. Five databases were searched: PubMed, CINAHL, Embase, Sociological Abstracts, and SocINDEX. A total of 552 citations were retrieved and after deduplication, 524 citations remained. Three research team members independently reviewed the titles of articles. After exclusion criteria were applied to titles and abstracts, 77 articles were identified for the full-text screening. After the application of inclusion and exclusion criteria, 24 full text articles were included in the final review. The nine principles of community-based participatory research were used to rank level of community collaboration in the studies. Few studies (n = 3) had a high level of community collaboration, while most studies (n = 21) had a low to moderate level. High level community collaboration included empowering pre-existing leaders and strengthening pre-existing community networks. This review suggests ways to increase community collaboration in public health initiatives in developing countries and demonstrates a need for further research to determine effectiveness and sustainability through community collaboration in research.

Introduction

Global health is one of the four priority areas for nursing science in the 21st century (Eckardt et al., 2017). Safe drinking water is a basic necessity that remains out of reach for many people, and nurses working in global health have an obligation to address this need. According to the World Health Organization (2017), 844 million people still lack safe drinking water (World Health Organization, 2017). Particularly rural regions of Latin America and Africa to be least likely to have access to clean drinking water (UNICEF, 2014).

Contaminated water and inadequate sanitation and hygiene contribute to the high incidence of infant and child morbidity and mortality in developing countries (Musoke et al., 2018). Infrastructure projects can address improvements in water, sanitation, and hygiene (WASH), such as piped water usage, latrine coverage, treatment of drinking water, and reduction of unprotected water sources (Musoke et al., 2018). However, the World Health Organization (2015) maintains that community collaboration is a key strategy for effective and sustainable public health initiatives, such as safe drinking water (World Health Organization, 2015).

In a study that included three African nations, investigators found positive community outcomes when community members collaborate and participate in public health initiatives ((Martin et al., 2017). In this study, community engagement and community dialogue on the demand and utilization of case management services and planning for individual and collective change were key to successful outcomes (Martin et al., 2017).

Other community engagement strategies to improve the sanitation and hygiene in developing countries include subsidies to increase ownership. In a study in the Dominican Republic to evaluate how functioning latrines reduce childhood diarrhea, Cha et al. (2017), found that having to pay subsidies to obtain latrines increased ownership, use, and sustainability.

Ownership over latrines included training in how to repair latrines in case of malfunction. Bennett et al. (2015) assessed the use of hand washing stations and safe drinking water in health care facilities in Kenya. Investigators found that with the availability of these resources along with community training, female heads of household improved knowledge and use of these facilities. Ulibarri, Betanzos, Betanzos and Rojas (2017) studied the effectiveness of integrated interventions to enhance mosquito control in Guatemala. They found that the training of healthcare workers from the community paired with engaged community members helped to improve sustainability. Sociocultural issues were important findings to strengthen community participation in the mosquito control (Ulibarri et al., 2017). By working side by side, community members believed organizations to be more trustworthy and genuine in their provision of assistance.

The World Health Organization (2015) worked with the country of Honduras to link improved nutrition with improved water and sanitation infrastructure. The interventions implemented in this case included actions such as a food aid program (food distribution, training of farmers, and home counseling), rehabilitation of water and sanitation infrastructure and a mechanism for both operation and maintenance (World Health Organization, 2015). This resulted in a high level of collaboration between the local government departments, which allowed everyone to work together and lead to an increase in both funding and local volunteers (World Health Organization, 2015). Successful collaboration in a developing country suggests the importance of this strategy for sustainable public health interventions. The increase in both funding and volunteers suggests that once successful interventions are identified, the resources necessary to keep them sustainable will be acquired.

There are country-specific factors that influence what approach a researcher should take when attempting to implement a sustainable intervention in another country. A study on the analysis of stakeholder management in relation to mega construction projects in developing countries considered characteristics important for collaboration to be successful, which included stakeholder interests, influences, and community engagement (Mok, Shen & Yang, 2015). When these factors are integrated into community interventions, trust and genuine partnerships are established with community members. However, trust and partnership development are country-specific, and this can vary depending upon cultural diversity (Mok et al., 2015). In a study about international collaboration patterns and the collaboration levels of emerging technologies, such as 3D printing and graphene technology, Bai and Liu (2016) found that the size of the country and geographic proximity to the intervention influenced collaboration patterns among 20 different countries. Further Bai and Liu (2016) found that strategies and policies put into place would be useful in establishing better connections between the communities and the companies.

Not all community collaborations have been successful. Investigators of several different studies have reported the failure of water filtration systems from being effective due to hidden infrastructure problems, technical failures and social failures (Larson, Hansen, Ritz, & Carreño, 2016; Stark et al., 2013). Larson and others (2016) found that in a Guatemalan village more secure household flooring (cement vs dirt) would promote the stabilization for use and storage of household water filter systems. Starkl et al. (2013) found that in three developing countries, India, Mexico and South Africa, water system failures were attributed to improper use of guidelines. Other reasons for water system failure was the unsafe technology, such as during rainwater harvesting and the possibility of contamination (Starkl Brunner, & Stenström, 2013). There also needs to be further investigation on the aspect of social franchising in community

engagement in developing countries. Social franchising is considered the application of principles of commercial franchising in order to provide a widely distributed health service (Beyler, Cruz & Montagu, 2013). This has allowed strengthening in some elements such as client volume and satisfaction in private sector healthcare, but it is necessary to evaluate the equity and cost effectiveness of these interventions in order to understand what it takes for developing countries to be more accepting of outside help (Beyler et al., 2013).

Interventions to obtain safe drinking water in developing countries need to be practical, sustainable and cost-effective to have the best outcome. Interventions that have been previously tried, such as chlorine tablets and piped water systems, have had limited effects (Andreolli, Giovannini, Fatone, Kyamunyogonya & Yatuha, 2015). Factors such as the environmental conditions, health status of community members, and their hygiene practices have had an impact on the sustainability of these interventions (Andreolli et al., 2015). Two studies that conducted research in developing countries on the acceptability and use of tabletop water filtration systems in developing countries suggested that diarrheal infections decreased following distribution of household water filtration systems (Larson, et al., 2016; Johanson & Claypool, 2017). Community collaboration was demonstrated indirectly in these studies. Larson et al. (2016) had community members participate in interactive workshops using the RANAS (Risks, Attitudes, Norms, Abilities, and Self-regulation) model in exchange for a tabletop water filtration system. Johanson and Claypool (2017) recruited the heads of each household involved to attend a translated teaching session on basic hygiene principles in order to receive a water filtration system. Both of these studies involved community members in training and demonstrations to engage in the proper use the water filtration systems.

In a study on assessing the health risk that is associated with drinking water from different sources in Sierra Leone, West Africa, Jimmy et al. (2013), found that fecal contamination is the greatest health risk associated with drinking water. By demonstrating inexpensive methods of disinfecting water and raising hygiene awareness through community education on the placement of latrines, fecal contamination was reduced and drinking water improved (Jimmy et al., 2013). Community involvement was seen through this study in its educational component and community members engaged in inexpensive ways to clean the water coming from these sources.

These studies provided background information on community collaboration to sustain public health initiatives in developing countries. In summary, it was found that there are several interventions that are successful in reducing the health effects of drinking unsafe water, as well as how to make these interventions sustainable through community involvement. By involving training community members and educating the population, it was more likely to establish trust and therefore sustainable interventions. However, problems found in this literature was in defining community collaboration or engagement and its intended effects. Sometimes, studies are not actually partaking in community engagement but rather simply providing a community with an intervention. What is unknown is how communities engage or participate in a public health intervention, to achieve an effective and sustainable health outcome.

Preliminary work

In 2008, a community-university partnership was established between La Union Centro Linguistico, a community-based health organization (CBO) in Guatemala, and East Carolina University College of Nursing to give health talks in rural villages concerning topics such as clean drinking water, oral hygiene, and healthy eating. The partnership then further expanded to

include a water filtration initiative in one rural Mayan village. Since that time, the Clean Water Project has expanded from one village to five villages (Larson et al., 2016). This project has reported on the clinical and practical significance of tabletop water filtration systems in reducing the incidence of diarrheal disease. Still, 29% of the participants had problems with using the water filters (Larson et al., 2016). This lead to a follow-up study to explore an indigenous explanation of health and illness. Braxton and Larson (2018), focused on how Maya caregivers explained health and illness in the context of this same village in Guatemala. In this study health was explained as access to food and clean drinking water, while illness was explained as behavioral changes and bodily symptoms (Braxton & Larson, 2018). Interviews with these Maya caregivers suggest a more collective approach to research is necessary rather that an individual approach.

The purpose of the current study is to build on these two previous studies and explore the impact of community engagement on the sustainability of public health initiatives, specifically in this case the use and impact of table-top household water filtration systems. In summer 2018, Corazon de los Niños, a non-profit community-based organization in Guatemala joined the La Union-ECU partnership when the Clean Water Project received financial donations to purchase and distribute 40 tabletop water filtration systems. The Director of Corazon de los Niños identified three Mayan communities in need of safe drinking water. The Director proposed the distribution of 10 water filters in Community A, 10 water filters in Community B, and 20 water filters in Community C (the largest village). She then suggested that families "collaborate" with the community-university partnership, by providing a contribution of 40 *quetzales* (US$5.50) to Corazon de los Niños. The Director explained that the contribution would make families take ownership of their water filters and to be used to cover the medical and dental expenses of

families in need. Selected families then received instruction on the care, assembly, and storage (away from animals and in reach of children) of the water filters. Each filter was marked with the date for replacing the filter (May 2020).

Research Question

The research question was: How does community collaboration influence the effectiveness and sustainability of a public health issue in a developing country?

Methodology

A systematized review was conducted using keywords and subject headings searched across five databases: PubMed CINAHL, Embase, Sociological Abstracts, and SocINDEX. Figure 1 shows the full search string that was used for PubMed. The search for all five databases was completed on 31 January 2019, and filters were applied for "last five years" and "English language." A total of 552 citations were retrieved. After deduplication, 524 citations remained. An Excel spreadsheet was created and utilized independently by researchers to allow for unbiased evaluation. Titles and abstracts were evaluated by two nursing faculty and one honor student with the health science librarian serving to resolve conflicts. Following this process, 77 articles were identified for the full-text screening. The following criteria were used to evaluate and exclude articles: not a quantitative or qualitative study; not about community engagement; not researching a developing country; not a public health initiative; and not written in English. Citations of the remaining 77 articles were transferred to Covidence to allow for unbiased selection in the full-text screening process. After the aforementioned exclusion criteria were applied to the full text articles, 53 articles were excluded, which left 24 articles to be included for coding by one faculty and the honor student.

The nine core principles of community-based participatory research (CBPR) were used to rank level of community collaboration in each study (Israel, Eng, Schulz, & Parker, 2013). The nine core principles are: the community is a unit of identity, builds on community strengths and resources, equitable partnership in all phases of research, promotes co-learning and capacity-building, achieves a balance between research and action, emphasizes local relevance of public health problems and attends to the multiple determinants of health, involves systems development through an iterative process, all partners involved in dissemination of findings, and long-term process and commitment (Israel et al., 2013).

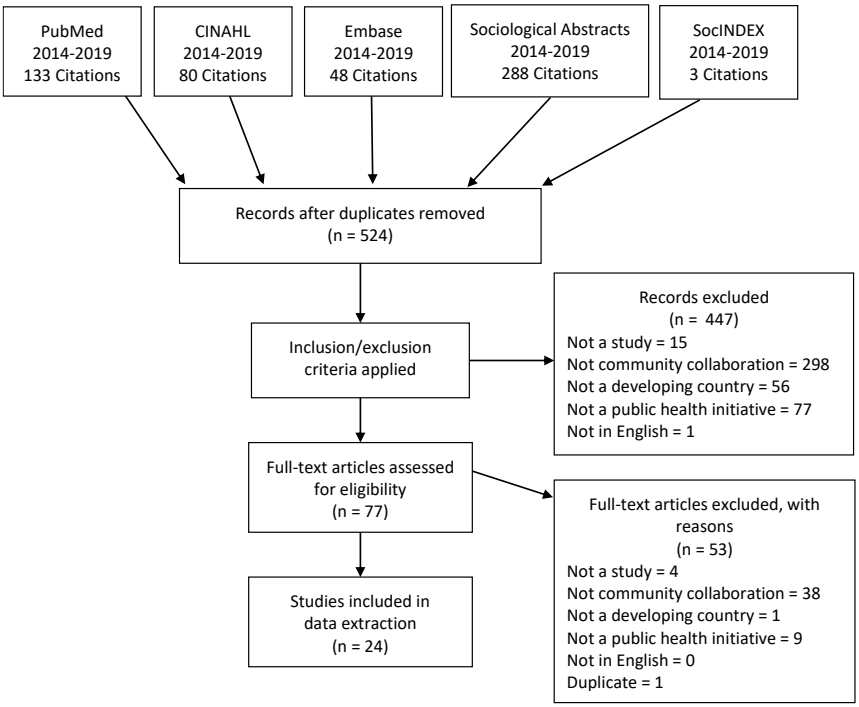
Figure 1. Full search string used for PubMed

("Community Participation"[Mesh] OR "community engagement"[tiab] OR "community involvement"[tiab] OR "community participation"[tiab] OR "community collaboration"[tiab] OR "community collaborations"[tiab] OR "community organizing"[tiab] OR "community partnership"[tiab] OR "community partnerships"[tiab] OR "community intervention"[tiab] OR "community interventions"[tiab] OR "school intervention"[tiab] OR "school interventions"[tiab] OR "community-based organization"[tiab] OR "community-based organizations"[tiab] OR "community buy-in"[tiab] OR "community funding"[tiab] OR "collective identity"[tiab] OR "sense of community"[tiab] OR "activist engagement"[tiab]) AND ("Public Health"[Mesh] OR "Public Health Practice"[Mesh] OR "Health Communication"[Mesh] OR "Health Promotion" [Mesh] OR "Community Health Planning"[Mesh] OR "Hygiene"[Mesh] OR "Hand Disinfection"[Mesh] OR "Sanitation"[Mesh] OR "Waste Management"[Mesh] OR "Water Supply"[Mesh] OR "Water"[Mesh] OR "Water Resources"[Mesh] OR "Water Quality"[Mesh] OR "Water Purification"[Mesh] OR "Drinking Water"[Mesh] OR "Mosquito Control"[Mesh] OR "public health"[tiab] OR "public health initiatives"[tiab] OR "water"[tiab] OR "water supply"[tiab] OR "water supplies"[tiab] OR "water system"[tiab] OR "water systems"[tiab] OR "drinking water"[tiab] OR "drinking water supply"[tiab] OR "safe drinking water"[tiab] OR "clean water"[tiab] OR "poor water"[tiab] OR "unprotected water source"[tiab] OR "unprotected water sources"[tiab] OR "water quality assessment"[tiab] OR "water quality assessments"[tiab] OR "point-of-use chlorination"[tiab] OR "sanitation"[tiab] OR "sanitation system"[tiab] OR "sanitation systems"[tiab] OR "sanitation improvement"[tiab] OR "poor sanitation"[tiab] OR "hygiene promotion"[tiab] OR "hygiene promotion intervention"[tiab] OR "hygiene promotion interventions"[tiab] OR "poor hygiene"[tiab] OR "WASH"[tiab] OR "mosquito control"[tiab] OR "mosquito-borne disease"[tiab] OR "mosquito-borne diseases"[tiab] OR "capacity building initiative"[tiab] OR "capacity building initiatives"[tiab] OR "hand-washing"[tiab] OR "hand washing"[tiab] OR "solid waste management"[tiab] OR "sustainability"[tiab] OR "sustainable planning"[tiab] OR "health communication"[tiab] OR "health intervention"[tiab] OR "health interventions"[tiab] OR "cultural grounding"[tiab]) AND ("Guatemala"[Mesh] OR "Central America"[Mesh] OR "South America"[Mesh] OR "Latin America"[Mesh] OR "Guatemala"[tiab] OR "South America"[tiab] OR "Central America"[tiab] OR "Latin America"[tiab])

Results

The screening process used for the systemized review are shown in Figure 2. From the databases searched, a total of 524 articles were retrieved after removing duplicates. Of the 524 articles, the inclusion criteria were applied and 24 of the studies were recent quantitative or qualitative studies that addressed community collaboration and therefore were eligible for inclusion in this review.

Figure 2. Flowchart of search results



The 24 studies included in this review were conducted in Central America (n = 12), South America (n = 10), Asia (n = 1) and Africa (n = 1) (Table 1). Most studies focused on community collaboration in infectious disease prevention (n = 13) (Table 1, article numbers 1, 2, 5, 6, 7, 8, 10, 13, 18, 20, 21, 23, 24). These studies ranged from a low to moderate level of community engagement involved in their study. Three studies focused on drinking water (n = 3) (Table 1, article numbers 14, 17, 19). Interestingly, each of these studies were ranked differently. Kuzdas

et al. (2014) ranked as having low community collaboration, Larson et al. (2016) ranked moderately, and Gentry and Metz (2017) was ranked high. There were 3 studies that concerned general health promotion (n = 3) (Table 1, article numbers 4, 15, 22), and one of these (Aizenberg, 2014) showed a high level of community collaboration while the other 2 articles showed a moderate level. Two articles concerned malnutrition (n = 2) (Table 1, article numbers 12, 16), both of which had a moderate level of community collaboration. Two studies evaluated community engagement (n = 2) (Table 1, article numbers 3, 9). Ahmad and Abu Talib (2015) was ranked low due to inconsistencies in the charts when compared to the data described in the report, and de Toledo and Luiz Giatti (2014) had a high level of community involvement. The last article that was utilized in this search concerned mental health and was ranked at a moderate level of community collaboration (n = 1) (Table 1, article number 11).

Few studies demonstrated a high level of community collaboration (using the CBPR criteria). Low level community collaboration (n = 9) demonstrated the use of three of the core principles of CBPR (Israel et al, 2003) (Table 1, article numbers 3, 6, 7, 8, 10, 17, 18, 21, 24). This means that they implemented community forums and workshops to educate the population and the facilitation of data collection (Lardeaux et al., 2015). A majority of the articles utilized a moderate level of community collaboration (n = 12) using six of the core principles (Israel et al., 2003) (Table 1, article numbers 1, 2, 4, 11, 12, 13, 15, 16, 19, 20, 22, 23). In these studies, there was community education sessions and community wide events such as parades, festivals, peer monitoring and clean-up campaigns, but these interventions failed to incorporate the communities into the evaluation and sustainability of said interventions (Arostegui et al., 2017). Only three articles used all 9 of the core principles of CBPR (n = 3) (Israel et al., 2003) (Table 1, article numbers 4, 9, 14). This included interventions such as empowering pre-existing leaders

and strengthening pre-existing networks within the community, while keeping the community involved throughout every step of the intervention (Aizenberg, 2014).

In this review, multiple infectious disease studies were related to the same research initiative, for example four studies concerned a program known as Camino Verde on the prevention of Dengue, Nicaragua and Mexico (n = 4) (Table 1, article numbers 1, 2, 5, 20). Most studies used a quantitative study design (n = 11), followed by a qualitative study design (n = 10) and mixed methods (n = 3) (Table 1). There were 10 studies that were conducted regarding vulnerable populations, four concerned women and children, and six concerned indigenous populations. The studies involving vulnerable populations were of interest to the researchers regarding the preliminary work that they had been involved in.

Table 1. Characteristics of included studies

ARTICLE	COUNTRY	DESIGN: SAMPLE:	PURPOSE: METHODS: FINDINGS:
1. Andersson, N., Nava-Aguilera, E., Arosteguí, J., Morales-Perez, A., Suazo-Laguna, H., Legorreta-Soberanis, J., . . . Harris, E. (2015). Evidence based community mobilization for dengue prevention in Nicaragua and Mexico (Camino Verde, the Green Way): cluster randomized controlled trial. *Bmj, 351*, 1-9. doi:10.1136/bmj.h3267	Nicaragua and Mexico	DESIGN: Pragmatic open label parallel group cluster randomized controlled trial SAMPLE: 60 clusters in Nicaragua and 90 clusters in Mexico, 85,182 residents in 18,838 households	PURPOSE: To assess the added value of evidence-based community engagement in dengue prevention- in Managua by scaling up already tested strategies, in Mexico by implementing these strategies in environments less hospitable to them, and in both places in a random sample of census enumeration areas METHODS: baseline study, intervention groups (separate for women and men), brigadistas, community events to raise public awareness like puppet shows, clean up campaigns, introduction of fish into water storage containers (Mexico only) FINDINGS: risk reduction of dengue in children by 29.5%; evidence-based community mobilization can add effectiveness to dengue vector control. Each site implementing the intervention in its own way has the advantage of local customization and strong community engagement; lower risk of infection using CE
2. Andersson, N., Arosteguí, J., Nava-Aguilera, E., Harris, E., & Ledogar, R. J. (2017). Camino Verde (The Green Way): evidence-based community mobilisation for dengue control in Nicaragua and Mexico: feasibility study and study protocol for a randomised controlled trial. *BMC Public Health, 17*(Supply 1), 11-20. doi:10.1186/s12889-017-4289-5	Nicaragua and Mexico	DESIGN: Cluster randomized controlled trial SAMPLE: 150 total clusters each with 137-140 households	PURPOSE: To reduce dengue risks through evidence-based knowledge translation. An explicit objective is to develop a sustainable community-oriented vector control approach that reduces the need for pesticides in water used in or around homes or areas that children frequent, or likely to be used with food or even as drinking water. METHODS: SEPA, baseline of household questionnaire, entomological assessment and saliva samples of children. Feedback of evidence from baseline, brigadistas, structural interventions to change Aedes aegypti ecosystem, intercommunity visits FINDINGS: Discussion of need for non-pesticide approach, need for strong community approach, and how it will be evaluated- look to next Camino Verde articles

3. Ahmad, M. S. & Abu Talib, N. Bt. (2015). Empirical investigation of community empowerment and sustainable development: quantitatively improving qualitative model. *Qual Quant, 49*, 637-655. doi: 10.1007/s11135-014-0014-y	Pakistan	DESIGN: Quantitative study SAMPLE: 357 completed projects	PURPOSE: To clarify the connection between community empowerment and sustainability of CD projects and identify impact of the sense of community on the relationships between members of a CD organization METHODS: Community field theory, psychological sense of community theory and empowerment theory; adapted multiple scales for every construct. FINDINGS: Community capacity building, community participation, community access to information were positively related to sustainability of CD projects.
4. Aizenberg, L. (2014). Facilitating indigenous women's community participation in healthcare: A critical review from the social capital theory. *Health Sociology Review, 23*(2), 91-101. doi: http://dx.doi.org/10.1080/14461242.2014.11081964	Bolivia	DESIGN: Ethnographic approach SAMPLE: 5 indigenous communities	PURPOSE: To examine how indigenous women who receive EXTENSA develop cooperation networks & improve reproductive health. METHOD: Interview focus groups; observation FINDINGS: Empowering pre-existing leaders; strengthening pre-existing networks (Mother's Club); access to external resources (EXTENSA) – use of assets.
5. Arostegui, J., Ledogar, R. J., Coloma, J., Hernandez-Alvarez, C., Suazo-Laguna, H., Carcamo, A., . . . Harris, E. (2017). The Camino Verde intervention in Nicaragua, 2004-2012. *BMC Public Health, 17*(Supply 1), 115-123. doi:10.1186/s12889-017-4299-3	Nicaragua	DESIGN: Feasibility study SAMPLE: 3200 households from 30 neighborhoods	PURPOSE: explore key issues and test activities before designing and launching a complex intervention; validated the experience of the feasibility study and the ethical principles that guided it METHODS: several surveys, both baseline and to find breeding grounds, response to intervention; SEPA, used clean up campaigns, parades and festivals, brigadistas, meetings with public institutions, facilitators, SEPA blog, neighborhood peer monitoring FINDINGS: findings showed that evidence grounded in the specific reality of each household and community has greater potential for mobilization than any didactic material proposing recipes that are equally applicable for everyone; increase in neighborhood solidarity and served as a well-spring of new leadership
6. Basso, C. et al., (2015). Improved dengue fever prevention through innovative intervention methods in the city of Salto, Uruguay. *Trans R Soc Trop Med Hyg, 109*, 134-142. doi:10.1093/trstmh/tru183	Uruguay	DESIGN: Cluster randomized control trial SAMPLE: 2000 households from 20 clusters	PURPOSE: To implement/evaluate interventions that increased effectiveness of institutions working on dengue prevention and encourage participation and empowerment of citizens. METHOD: Entomological survey; com. campaign for removal of containers. Households informed received plastic bag. FINDINGS: 36% filled bags; 63% empty bags; Only sustainable if political/institutional responsible with policies.
7. Basso et al. (2017). Scaling up of an innovative intervention to reduce risk of dengue, chikungunya, and Zika transmission in Uruguay in the framework of an intersectoral approach with and without community participation. *Am. J. Trop. Med. Hyg., 97*(5), 1428-1436. doi:10.4269/ajtmh.17-0061	Uruguay	DESIGN: Cluster randomized control trial SAMPLE: 2000 households from 20 clusters	PURPOSE: To increase the impact of successful health interventions and promote public policy. METHOD: Information shared in communities with social groups, schools, and community organizations. Containers collected; household survey FINDINGS: 37% of households had received information, community engaged hindering factors: elections created uncertainty, few homes visits; community engaged favoring factors: 86% bags collected; 58% had un-used containers in homes despite campaigns.
8. Caprara, A. et al. (2015). Entomological impact and social participation in dengue control: A cluster randomized trial in Fortaleza, Brazil. *Trans R Soc Trop Med Hyg, 109*, 99-105. doi:10.1093/trstmh/tru187	Brazil	DESIGN: Cluster randomized control trial SAMPLE: 10 intervention clusters, 10 control clusters	PURPOSE: To control productive and discarded containers through an ecohealth approach; analyze effectiveness in reducing vector density. METHOD: Community workshops, clean-up campaigns, distributing IEC; entomological survey FINDINGS: History of community organization had high levels of leadership; low levels of leadership in communities without community organization

9. de Toledo, R. & Luiz Giatti, L. (2014). Challenges to participation in action research. *Health Promotion International, 30*(1), 162-173. doi:10.1093/heapro/dau079	Brazil	DESIGN: Action Research SAMPLE: 2700 inhabitants from 440 households	PURPOSE: To understand challenges/experiences related to community participation in research. METHOD: multiple-community question/interviews, participant observation, talking map, photo panel, geo-referencing, parasite investigation, study of solid waste, soil samples, talks/short courses, meeting to present results, research report, demands-petitions. FINDINGS: Direct/immediate feedback – encourages social participation in real time, evidence of how results provide adaptation; indirect/non-immediate feedback: participation at a later moment. Challenges to overcome: social mobilization: group acts on common objective; co-operation: equitable participation; appropriation: apprehend the local knowledge; proactive stance: moving forward to push necessary policies
10. de Urioste-Stone, Pennington, P. M., Pellecer, E., Aguilar, T. M., Samayoa, G., Perdomo, H. D., Enriquez, H., & Juarez, J. G. (2015). Development of a community-based intervention for the control of Chagas disease based on peridomestic animal management: an eco-bio-social perspective. *Trans R Soc Trop Med Hyg, 109*, 159-167. doi:10.1093/trstmh/tru202	Guatemala	DESIGN: Situational analysis SAMPLE: 472 households among 30 communities	PURPOSE: To address T, dimidiata infestations through an integrated approach to ensure sustainable Chagas disease control METHOD: Education with community member on rodent control, organic waste management, spraying, and transmission FINDINGS: Sustainability will depend on collaboration between the health center, local NGOs, other government agencies and community members.
11. Espinoza, E. C., Rivera-Holguin, M., Pacheco, M. S., Sotelo, E. A., & Bejar, P. U. (2015). Women's participation in a postconflict community in Peru. *J Prev Interv Community, 43*(4), 279-290. doi:10.1080/10852352.2014.973298	Peru	DESIGN: Participatory intervention, qualitative SAMPLE: 100 participants: 75 women, 25 men	PURPOSE: To describe and analyze the actions and results of a community mental health (MH) project in Peru to address conflict aftermath of war. METHODS: 2-month familiarization time period; Participatory strategies to identify communities' prioritized problems, established actions appropriate to the cultural characteristics of the population, and implemented creative and recreational initiatives. Six MH initiatives- actively involving the community FINDINGS: Participants created their own sense of security that facilitated taking control and power in their lives; active citizenship allowed the exercise of rights.
12. Farfán, J. C., Marulanda, S. C., Zapata, I. C., & Cainas, N. E. (2018). Community perspectives about sociocultural conditions associated with children's health among the Nasa people in Colombia. *Prog Community Health Partnership, 12*(3), 279-288. doi:10.1353/cpr.2018.0052	Columbia	DESIGN: Community Based Participatory research (CBPR)-Qualitative SAMPLE: 23 participants	PURPOSE: To study the Iquira Nasa community perspectives about socio cultural conditions influencing children's health. METHODS: Needs assessment with community members via discussion group to identify major health problems; refined using tree problem analysis in additional focus group-photovoice also utilized as third assessment tool. FINDINGS: Community participants perceive an increase in disease and children's death associated with changes in their ways of life related to moving closer to mestizo people after displacement
13. Garcia-Betancourt, T., Gonzalez-Uribe, C., Quintero, J., & Carrasquilla, G. (2014). Ecobiosocial community intervention for improved Aedes aegypti control using water container covers to prevent dengue: lessons learned from Girardot Colombia. *Ecohealth, 11*(3), 434-438. doi:10.1007/s10393-014-0953-8	Columbia	DESIGN: Qualitative, participatory research SAMPLE: 111 participants	PURPOSE: Engage the community in an Ecobiosocial approach to an intervention of container covers to reduce incidence of Dengue. METHODS: Ecobiosocial approach- transdisciplinary study of vector density baseline, then construction, implementation and evaluation of curtains on windows, doors and water containers FINDINGS: Community involvement in the creation and elaboration process was crucial for the acceptance of the project and to achieve an intervention that can be sustainable and replicable.
14. Gentry, J. & Metz, B (2017). Adjusting photovoice for marginalized indigenous women: Eliciting Ch'orti' Maya women's perspectives on health in Guatemala. *Human Organization, 76*(3), 251-263. doi: 10.17730/0018-7259.76.3.251	Guatemala	DESIGN: Photovoice method SAMPLE: 470 households	PURPOSE: Explore community perceptions of health and environment in eastern Guatemala to guide the EWB-USA project and build trust and compile photos for education and the elicitation of donations. METHODS: Open meeting-17 women volunteered by community leaders; intro workshops; Kodak Easy Share digital

			cameras; demonstrated US problems in the environment as examples; 48-hours taking photos of anything that affects community health FINDINGS: Ten themes – physical structures, water, insects, health, roads, sanitation, school, malnutrition, resp. issues, solid waste, and diarrhea. Interviews plus photos: physical structures, water, malnutrition, sanitation, resp. infections, diarrhea problems taken for granted.
15. Haubert, J., & Williams, G. (2015). The Rocha Nicaragua Project: Using research to build relationships in international service learning. *Humanity & Society, 39*(2), 170-188. http://dx.doi.org/10.1177/0160597615570941	Nicaragua	DESIGN: Descriptive SAMPLE: 35 households in Rocha and 33 households in Tierra Blanca	PURPOSE: To assess past projects and identify future needs while emphasizing the importance of research related to ISL. METHODS: Surveys, oral histories and community meetings to determine the communities' perspectives and needs related to community service-learning projects. FINDINGS: 1- Holistic understanding of the community is necessary for successful ISL collaborations. 2- Time, patience, and dedication needed to do quality work, whether service work or research. 3-Building supportive, reciprocal relationships make ISP work more relevant & sustainable.
16. Kadetz, P. (2014). Positive deviance: Employing an assets-based approach to foster community agency and reduce chronic malnutrition in indigenous Guatemala. *Social Development Issues, 36*(3), 56-72. Retrieved from http://search.proquest.com.jproxy.lib.ecu.edu/docview/1660145537?accountid=10639	Guatemala	DESIGN: Mixed-methods SAMPLE: 260 participants from 12 communities	PURPOSE: To identify whether the employment of an assets-based development approach to malnutrition may yield different assessments and outcomes than a needs-based approach. METHODS: Food survey, ethnographic participant observation, interviews, surveys FINDINGS: Positive deviance within communities (families with good nutrition); positive deviance between communities (San Juan La Laguna – educated, young mayor, entire community makes decision, restricted tourism). Community capacity and community agency**.**
17. Kuzdas, C., Wiek, A., Warner, B., Vignola, R., & Morataya, R. (2014). Sustainability appraisal of water governance regimes: the case of Guanacaste, Costa Rica. *Environ Manage, 54*(2), 205-222. doi:10.1007/s00267-014-0292-0	Costa Rica	DESIGN: Qualitative, sustainability appraisal SAMPLE: 58 interviews with businesses and 29 participants at 3 workshops	PURPOSE: 1-To provide a sustainability appraisal of the water governance regime; 2- To reflect on potential impacts resulting from the appraisal and draw conclusions for future water governance and sustainability; 3- To identify challenges and opportunities for water sustainability efforts. METHODS: interviews and stakeholder workshops FINDINGS: TWO critical points for sustainable water governance: devising alternative governance schemes for improved groundwater management and protection and renewed efforts and investments to reconcile with rural communities. Opportunities- investing in existing grassroots organization that already make positive impacts and leveraging "policy windows" to disperse more authority to local, regional, and basin-scale actors.
18. Lardeux, F., Depickere, S., Aliaga, C., Chavez, T., & Zambrana, L. (2015). Experimental control of Triatoma infestans in poor rural villages of Bolivia through community participation. *Trans R SocTropMedHyg,109*(2),150-158. doi:10.1093/trstmh/tru205	Bolivia	DESIGN: Descriptive, situational analysis, quantitative data review SAMPLE: 4 villages, 100 households per village	PURPOSE: To investigate the ecological, biological and social factors that may contribute to a sustainable approach towards Chagas vector control using ecosystem approach. METHODS: Social and entomological surveys were carried out in four villages to identify risk factors for house infestation, implementation of low cost vector control (mud walls, cleaning, removal of poultry in homes). FINDINGS: Community participation is a key factor.
19. Larson, K. L, Hansen, C., Ritz, M., & Carreño, D. (2017). Acceptance and impact of point-of-use water filtration systems in rural Guatemala. *Journal of Nursing Scholarship, 49*(1), 96-102. doi: http://dx.doi.org.jproxy.lib.ecu.edu/10.1111/jnu.12260	Guatemala	DESIGN: Descriptive correlational design using theory-based community participation model RANAS SAMPLE: 71 households	PURPOSE: to examine the uptake of tabletop water filtration systems in reducing the incidence of diarrheal disease in Maya community in Guatemala. METHODS: Community forums for instruction and distribution of water filters, community leaders endorsed water filters, demonstrations by community partners, agency contacts provided. Household survey regarding: family health and water filter usage. FINDINGS: Water filters were both practically and clinically effective in reducing diarrheal disease in the study population. 70% use, 30% non-use.

20. Ledogar, R. J., Arostegui, J., Hernandez-Alvarez, C., Morales-Perez, A., Nava-Aguilera, E., Legorreta-Soberanis, J., . . . Andersson, N. (2017). Mobilising communities for Aedes aegypti control: the SEPA approach. *BMC Public Health, 17*(Supply 1), 403. doi:10.1186/s12889-017-4298-4	Mexico and Nicaragua	DESIGN: Descriptive SAMPLE: 140 households	PURPOSE: To explain the SEPA concept, giving examples of how it has been utilized in different countries and contexts, including the Camino Verde intervention. METHODS: SEPA Approach to education of communities: community brigadistas performed brief questionnaires and conducted entomological inspections in consenting households. Visiting brigadistas then presented their findings to the host brigadistas and together discussed adjustments to approaches being used. Meetings among facilitators and brigadistas from different communities helped assure commonality of purpose and process. FINDINGS: The SEPA approach is appropriate for mobilizing communities to combat diseases transmitted by the Aedes aegypti and is applicable in different community and country conditions.
21. Manca, M. C. (2017). 'Yassaba' or the fear of being abandoned: Adapting health-promotion messages to incorporate local meanings in Guinée Forestière. *Anthropology in Action, 24*(2), 9-14. doi: http://dx.doi.org/10.3167/aia.2017.240202	Guinea	DESIGN: Qualitative Descriptive SAMPLE: 30 Health Promoters worked in Ebola clinic and surrounding communities	PURPOSE: To present the authors reflections and experiences as a Health Promotion Coordinator related to thoughts and perceptions surrounding Ebola. METHODS: Focus group discussions and interviews with health-care workers, Ebola survivors, relatives of individuals with EVD. Health promotion messages and activities. FINDINGS: Three conceptual themes emerged: words, places and local networks that helped formulate health promotion approaches.
22. Porto, M. F., Cunha, M. B., Pivetta, F., Zancan, L., & Freitas, J. D. (2016). Extended communities for action-research as a tool for the emancipatory promotion of health: Conceptual and methodological bases. *Cien Saude Colet, 21*(6), 1747-1756. doi:10.1590/1413-81232015216.25802015	Brazil	DESIGN: Action research-ECAR: Extended Communities For Action Research SAMPLE: 3 territories	PURPOSE: To contribute to the methodological discussions on the "participation" pillar that guides strategies for Health Promotion. METHODS: ECARs created in three regions including a researcher, PIBIC receivers of grants, residents that receive extension grants, and young people that are in the vocational scientific programs, as well as an additional large ECAR with the goal of improving communication (creating a network) on how to promote health related to the problems in slum areas. FINDINGS: ECAR can be viewed as a move from a behavioral model to an emancipatory model in the promotion of health
23. Triana, D. R., Mertens, F., Zuniga, C. V., Mendoza, Y., Nakano, E. Y., & Monroy, M. C. (2016). The role of gender in Chagas disease prevention and control in Honduras: An analysis of communication and collaboration Networks. *Ecohealth, 13*(3), 535-548. doi:10.1007/s10393-016-1141-9	Honduras	DESIGN: Qualitative interviews SAMPLE: 108 individuals from 57 households	PURPOSE: To understand the role of men and women in the implementation of a com.-level intervention based on housing improvements to reduce mosquitos. METHOD: Ecohealth intervention implemented in the community (education and encouragement of remodeling walls, converting floors, etc.); semi-structured questionnaire completed in each of 57 households. Contained three categories: individual-level variables, network variables and knowledge of Chagas disease and adoption of housing improvement. FINDINGS: There were differences in how men and women responded to intervention training. Differences were tied to their socioeconomic status, knowledge of Chagas, transmission, community participation, and their social ties.
24. Ulibarri, G., Betanzos, A., Betanzos, M., & Rojas, J. J. (2016). Control of Aedes aegypti in a remote Guatemalan community vulnerable to dengue, chikungunya and Zika virus: Prospective evaluation of an integrated intervention of web-based health worker training in vector control, low-cost ecological ovillantas, and community engagement [version 1; referees: 4 approved with reservations]. *F1000Res, 5(*598), 1-22. doi:10.12688/F1000RESEARCH.8461.1	Guatemala	DESIGN: Qualitative & quantitative SAMPLE: 84 households, 16 focus groups	PURPOSE: To study the effectiveness of an integrated intervention of health worker training, a low-cost ecological mosquito ovitrap, and community engagement on Aedes spp. mosquito control over 10 months in a community at risk of dengue, chikungunya and Zika virus transmission. METHODS: The intervention included three components in an integrated fashion: training health workers in vector control, low-cost ecological mosquito ovillanta, and community engagement. FINDINGS: The three-component integrated intervention proved beneficial.

Discussion

This systemized review was able to explore the factors that influence community collaboration on public health initiatives in developing countries and determine the levels of community collaboration. These findings may alert researchers to the use of the nine principles of CBPR and serve as a step towards expanding the role of community members in research. Nonetheless, caution must be utilized when interpreting these results, given the nature of the small sample included in this study.

The few studies that had a high level of community collaboration demonstrated full potential of community collaboration. As stated in Aizenberg (2014), "community collaboration has been identified as the key to primary healthcare and is expected to bring about benefits such as better use of existing health services and increased sustainability of new services by allowing the community to be involved in the decision making of the development of the services." For true action research reciprocal relationships between academic or non-profit organization and the communities involved for sustainability. These relationships take years to develop and establish rapport between partners, which should be planned for in conducting community collaborative research. It is also extremely important that researchers attempt to strengthen pre-existing leaders and solutions already in existence in some the community (Kadetz, 2014). By doing so, this eliminates the need to bring in outside resources and capitalize on community assets.

There were three studies that included the nine principles of CBPR demonstrates important strategies for community collaboration. Gentry and Metz (2017) utilized a Photovoice technique among indigenous Guatemalan women to increase their awareness of current health problems in their community. Following training in photovoice, women took photographs of what they thought was a health concern (Gentry & Metz, 2017). The women discussed the

photographs and interventions that could be implemented to address health issues (Gentry & Metz, 2017). Keeping the population involved at every step during the research is a key element of establishing rapport and establishing a trusting relationship with the community, because this in turn will make interventions that are being implemented sustainable. Aizenberg (2014) empowered pre-existing leaders and strengthened pre-existing networks already present in the communities in order to allow interventions implemented to become sustainable, seeing that their resources would never run out. Empowerment allowed the community members to develop their own capabilities in order to join forces to achieve better results, in this case regarding their healthcare (Aizenberg, 2014). De Toledo and Luiz Giatti (2014) utilized a wide array of interventions, such as interviews, participant observation, talking map, photo panel, geo-referencing, talks and short courses, a community newspaper, and demands-petitions in order to elicit a maximum level of community collaboration.

The majority of the studies included community members by utilizing interventions such as community forums and education. Some of the educational workshops included activities such as parades, pamphlets, and other ways to get the information and education necessary to the community. They informed the community on what they thought they should be doing and told them how to implement it, community members were least likely to have an equitable part in the implementation and evaluation components of the intervention. In the three studies that were identified as high level CBPR, the communities were involved in every step of the interventions, which included the trouble shooting, the evaluation and next steps. It is vital that communities are involved during this part of the research process, doing so allows a relationship to be established and in turn make these interventions sustainable.

We did not discover any studies which included monetary buy-in with community members that would support community collaboration in a public health initiative.

Limitations

One limitation that the researchers faced was the time constraints on the period of time that was available to complete the systemized search. We did not use the search term "community based participatory research" which was another limitation.

Implications for Research and Practice

We suggest several avenues for future research in this area. We need a better understand of the impact of monetary contributions on the sustainability of public health initiatives in developing countries. A common definition of community collaboration in research, such as the nine principles of CBPR, is critical to advancing the science of community collaboration in research. Community collaboration should be considered a key component to all research in developing countries.

This research has shed new insight into what CBPR truly means to be applied in research in a developing country. Community-based interventions must involve the community at some level. Education and training are considered to be low level involvement, yet these interventions are commendable and essential to provide communities with on-going health information. Health services can benefit greatly from community advisory boards providing input on services and programs. By establishing partnerships with community members, incorporating their culture, and involving them in the intervention, community collaboration will significantly increase the likelihood that the intervention will persist once research teams are no longer in the developing country.

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