Original Research Article

The role of Participatory Learning and Action on strengthening the different domains of empowerment on self-medication with antimicrobials in Nyalenda Informal Settlement, Kisumu County, Kenya

Abstract

Introduction: Self-medication with antimicrobials (SMWA) is a common global practice. Studies in Nyalenda B Ward, an informal settlement in western Kenya, found significant households (76.6%) perceived the practice of SMWA as convenient and appropriate. The rationale of the current study was in response to unsolved self-medication practice through Functional Health literacy in such set-ups.

Aims: This study used Participatory Learning and Action (PLA) as a tool and assessed its role on strengthening the different domains of empowerment on SMWA. Data was collected from 1531 PLA trainees through focused group discussions and structured questionnaires. Results revealed that the reasons for SMWA are ignorance and easier accessibility.

Study design: The study was carried out in Nyalenda B Ward, a sub-location in Nyalenda informal settlement within western Kenya. Nyalenda is the second-largest informal settlement in Kisumu, after Manyatta, and is situated to the south of the Kisumu city

The study adopted a descriptive survey design and the data was collected through a structured questionnaire and focused group discussions (FGDs).

Results: Logistic regression analyses to establish the association between PLA domains and all empowerment domains, revealed that flexible learning and listening increase power within by 5 times (OR=5.361, 95%CI=3.101-9.268, *P*<0.0001), power with by 6 times (OR=6.160, 95%CI=3.437-11.39, *P*<0.00010) and power over by 2 times (OR=2.261, 95%CI=1.293-3.954, *P*<0.0001). Participatory evaluation may increase power within by almost 8 times (OR=7.711, 95%CI=5.184-11.459, *P*<0.0001), power with by 5 times (OR=5.012, 95%CI=3.375-7.443, *P*<0.0001), and power over by more than 3 times (OR=3.618, 95%CI=2,375-5,509, *P*<0.0001). Participatory interaction may increase power within by almost 8 times (OR=7.823, 95%CI=4.798-12.763, *P*<0.0001), power with by over 8 times (OR=8.610, 95%CI=4.987-14.866, *P*<0.0001.), power over by 4 times (OR=4.003, 95%CI=2.325-6.693, *P*<0.0001).

Conclusion: It is concluded that PLA on SMWA may increase the community empowerment with knowledge and skills of SMWA with a magnitude of 8 but the ability to negotiate their inclusion in the health system may increase with a comparative lower strength of 2 times.
Keywords: Self-medication with antimicrobials; participatory learning and action; community empowerment.

INTRODUCTION

Self-medication is the obtaining and consumption of a drug without the advice of physician either for diagnosis, prescription or surveillance of treatment (Montastruc, Bagheri, Geraud, & Lapeyre-Mestre, 1997) or the use of medication by a patient on his own initiative or on the advice of a pharmacist or a lay person instead of consulting a medical practitioner (WHO, 2000). The practice can readily relieve acute medical problems, save time spent in waiting to see a doctor, save life in a cute condition and may contribute to decreased healthcare cost (Hughes, McElnay, & Fleming, 2001), however, it may result in wasting of resources, increase in pathogens resistance, drug interactions, adverse drug reactions, prolonged suffering and drug dependence. The practice has the potential of harming society at large as well as the individual patient (WHO, 2001).

The prevalence of self-medication with antibiotic ranges from 48% in Saudi Arabia to 78% in Yemen and Uzbekistan (Belkina Tatyana, 2014), in Sudan, Khartoum State 73.9% (Awad, Eltayeb, Matowe, & Thalib, 2005), in Kenya within Nyalenda B Sub Location is at 76.9% of the households (Owour, 2015) while in Ethiopia it is low (14.5%). Laws and policies are in place to manage antibiotics, but the Kenya government regulation is neither effective nor enforced. The positive attributes of self-medication are shared among the patients, healthcare professionals, the healthcare system and the pharmaceutical industry but the patient and the community meets the risk because they have inadequate or lack of knowledge and understanding of the risks associated with self-medication. It has been established that the communities that are neither empowered with knowledge and skills of self-medication with antimicrobials nor ability to negotiate their inclusion in the health system are prone to SMWA (Nasir, 2012; Ocan et al., 2014; Okeke et al., 2005) expanding access to such social entitlements will facilitate the reduction of the level of

self-medication with antimicrobials and promote perceptions with an experiential value therefore enhancing rationale use of antimicrobials and minimizing risk.

The rationale of the current study was developed in response to unsolved issues in self-medication with antimicrobials, especially in informal settlements. The conventional approaches to controlling self-medication with antimicrobials are less effective and have not yielded the desired result in the affected regions. The study realizes the importance of identifying where the problem lies by accessing the tacit knowledge, which varies across people, communities and areas and it is often specific to locality, age, gender and class. Such knowledge is contextual and includes answers to many questions, augments problem solving abilities of both local communities and the researcher and helps in probing relational linkages between issues and causal forces from different dimensions. The study also recognizes the fact that there are multiple perspectives of primary stakeholders of self-medication with antimicrobials. Appreciating such multiple perspectives is crucial in determining the priorities and preferences of the primary stakeholders. This study therefore embraced the issue of human development and community involvement or ownership for the purpose of sustaining this intervention. Given the need to control self-medication with antibiotics 'from the ground up', the perspectives of the community, must become a normative part of self-medication research. The PLA is a powerful, practical 'fit-for-purpose' methodology for achieving this since it enables groups to engage meaningfully and contribute with ease to academic research.

A community mobilization using empowerment model as a strategy can be implemented through Participatory Learning and Action (PLA) as a tool. (Kabeer, 2003) refers to empowerment as the processes by which those who have been denied the ability to make choice acquire such ability. There must have been the ability to have chosen differently and if the alternative does exist for you. The concept of empowerment exists in three dimensions: The resource dimension which includes, economic, human, social, political and cultural resources that serves to enhance the ability to exercise choice. The agency dimension which is the ability to define one's goals and act upon them. The achievement dimension that refers to the extent to which this potential is achieved or fails to be achieved in relationship to the outcomes of people's efforts.

Insights from gender theory into the empowerment debate have increased clarity over the concept and operation of power, most notably that power is about more than just 'power over' people and resources. Previous literature (Rowlands, 1997) categorizes four types of power relations to stress the difference between power over (ability to influence and coerce) and power to (organize and change existing hierarchies), power with (power from collective action) and power within (power from individual consciousness). At present, much of the focus of both community participation and empowerment is placed on participatory approaches. Participatory Learning and Action is another variation of Participatory Action Research that began in rural development research. The theory and practice of PLA (Chambers, 1997), recognizes the ability of the non or poorly educated people to make and carry out rational and successful decisions and actions that were formerly the responsibility of experts, allows innovation to be spread by peer groups not only by professionals and brings about a role reversal where local people become colleagues of professionals, thereby generating a change in attitudes and behaviors of the professionals. Using visualizations, PLA has been used in a wide range of situations for supporting empowerment goals, through role plays and draw and write techniques as the basis for generating information (Susan, 2001). It is an approach for learning and organizing local communities and groups for interacting with them, understanding them and learning from them. It helps in initiating a participatory process, in sustaining it and in opening up vistas of avenues for participation. It enables the local people to express, enhance, share and analyze their knowledge of life and condition and to plan and act. It is a means of understanding and facilitating and evoking their participation and also opening ways to which such groups can participate in decision making, project design, planning, execution and monitoring (Melzack, 1973; Mukherjee, 2001).

It is upon this background that we conducted a study to establish the role of Participatory Learning and Action (PLA) on strengthening the different domains of empowerment on self-medication with antimicrobials in Nyalenda informal settlement, within Kisumu County, Kenya.

MATERIALS AND METHODS

Study area. The study was carried out in Nyalenda B Ward, a sub-location in Nyalenda informal settlement within western Kenya. Nyalenda is the second-largest informal settlement in Kisumu, after Manyatta, and is situated to the south of the Kisumu city. Nyalenda is on latitude -.1267 and longitude 34.7575. The area is bound by Ring Road to the North and marshlands to the South and consists of two separate settlements or Sub-Locations, Nyalenda A and B. Nyalenda B features five smaller units (Kilo, Got Owak, Dunga, Nanga and Western), that occupy an area of 4.7 km^2.Nyalenda B Sub-Location has a population of approximately of 32,430, out of which 16,189 are males and 16,241 are females distributed in a total of 8,561 households (KIHBS, 2005/06).

Study design and population. The study adopted a descriptive survey design and the data was collected through structured questionnaire and focused group discussions (FGDs). The study purposively picked 30 CHVs that were trained on PLA on self-medication with antimicrobials (SMWA) as peer trainers. The PLA workshop on SMWA was conducted followed by 150 PLA open learning sessions for 1501 households. This was facilitated by the trained CHVs. The households open learning sessions was conducted within 2 weeks concurrently. Each trained CHV facilitated 5 open learning sessions composed of 10 households and administered a questionnaire for each individual at the end of each session. Prior to the conduct of The Team's PLA workshop, a planning meeting was held by the researcher, the Community Health Extension Officer (CHEW), County community focal person, Sub-County community focal person and selected community representatives to prepare the actual conduct of the discussions. Members discussed and agreed on the date and the mode of CHVs invitation. Discussions for this study was held in collaboration with the Nyalenda Health Centre.

CHVs PLA workshop

On the day of the CHV PLA workshop, team introductions and community representation were done. Explanations of PLA technique and its principles were provided. Self-medication with antimicrobials problem statement was explained. Illiterate participants were to ask their group members to help write down their ideas. The CHV PLA workshop randomly formed 6 break-out groups. Participants were asked to first take part in their group with interest. Each group

nominated a group facilitator together with a note-taker. Groups ran concurrently and each group discussion session lasted about 2 hours. Groups recorded notes on cards and flipcharts and presented at the end of the session. During feedback, an opportunity was given to the participants to further elaborate any of their ideas, or clarify any idea they felt had not been captured in perspective. Data synthesis following CHV PLA workshop was done on the second day. Note-takers first presented the outcome of their group discussions followed by brief feedback or further input from the wider group. Finally, after all group presentations and feedback, participants were asked to evaluate whether their expectations had been met. From group work, issues identified by participants as major root causes of SMWA, their proposed actions towards its elimination, the process towards achievement of the desired actions as well as the responsibility of stakeholders were presented.

Each group ranked the most important root causes of self-medication with antimicrobials by rearranging the causes in order of "changeability", from most changeable to least changeable and identification of potential strategies for addressing root causes of SMWA. The team then formed one major group and used index cards for direct ranking. Index cards bearing similar concerns/ideas were grouped together and tallied. This was followed by data interpretation.

PLA meetings at the household level

This was conducted summarily because of the household representatives' impatience. Every group of 10 household representatives was taken through SMWA problem statement and problem analysis using the problem tree, identification of root causes, identification of most important root causes and identification of possible solutions to the problem. Objective analysis, identification of root causes that are both important and changeable and ranking potential strategies to address root causes (important and changeable) of self-medication was not done at the household level because of limited time. On a later date, the trained CHVs and the researcher had an open discussion and ranked the households most important root causes of SMWA, the potential strategies for addressing them, and identification of barriers to the progress of SMWA control.

To mitigate for the barriers or to implement structural intervention, the study gave a feedback report to the local community health facility management on their findings.

The researcher, the CHEW for the Nyalenda B CHVs and the health management representatives then organized for a conflict management meeting. The CHVs encouraged themselves to continue with the household health promotion and especially community mobilization on self-medication with antimicrobials with a general aim to conduct an Integrated Health Outreach services.

Data collection procedures

During PLA, data was collected by the nominated note-takers for every group. Groups recorded notes on cards and flipcharts and presented at the end of the session. Structured questionnaires for the assessment of PLA and empowerment was then administered to all the trainees at the end of PLA. The CHVs received training on data collection, key components of the study, including the objective, detailed content of the questionnaire, and its administration in a way that protected the identity and privacy of the respondents. The questionnaire was pre-tested in a sub-section of the CHVs (whose data was not included in the final analyses) and necessary corrections were made on questions that were not clear. The questionnaire contained closed-ended questions on socio-demographic characteristics of the trainees and questions in a Likert scale of 4 for evaluation of all domains of PLA and Empowerment. This study developed a Participatory Learning and Action and Empowerment Evaluation (PLAEE) tool (See Supplementary Data File I) that had the type of questions used for measuring the level of all the PLA and empowerment domains and the measurement procedure. This tool was developed by adopting relevant ideas from Growth and Empowerment Measure (GEM) survey (Haswell, 2010), the Trocaire awareness index tool (Trocaire, 2012), a Community Ownership and Preparedness Index (COPI) tool (Thomas, 2011), and a summative evaluation type tool (Tyler, 1974). Studies that measured the level of PLA and empowerment (Vassall et al., 2014) and those based on participants perceptions and valuation using *etic* and *emic* criteria and analysis(O'Reilly-de Brún, 2016) were reviewed. Finally, theoretical literature on PLA and empowerment was reviewed. The Growth and Empowerment Measure (GEM) survey tool comprised of a 14-item Empowerment Scale. The GEM was developed as a tool to measure the process and outcomes of empowerment interventions such as Family Wellbeing (FWB).The GEM gave some of the measurable characteristic of empowerment like self-capacity, inner peace, strength, happiness and

connectedness. This was assessed using questions in a Likert scale. The Trocaire awareness index tool was used for assessing the effectiveness of empowerment by asking questions on awareness of rights, knowledge and duties. A Community Ownership and Preparedness Index (COPI) tool and a Behavioral Tracking Survey (BTS) were carried out to assess the levels of preparedness of the CBOs and their members and to determine the strength of community mobilization. BTS used an interview tool with coded questions on behaviors and perceptions concerning participation in group activities, beliefs about collective action, safe sex practices and STI treatment seeking. A summative evaluation type assessed the worth of the workshop activities (Tyler, 1974). The reliability analysis was done for the tool and the Cronbach's Alpha of 0.894 was recorded. PLA and empowerment theoretical literature identified PLA domains as flexible learning and listening, participatory evaluation, participatory interaction and empowerment domains as power within (Increased awareness and desire to change), power with (Increased solidarity to challenge underlying assumptions), and power over (changes in underlying resources and power to challenge constraints).

The PLAEE (See Supplementary Data File I) tool contained questions for PLA (for each domain) and empowerment (for each domain) assessment in a Likert scale of 4 and they were coded as 1= Very good, 2=Good, 3=Somehow, and 4=No. Each variable (domain) was assessed using 3 or more questions.

Statistical Analysis

All statistical analyses were carried out using the Statistical Package for Social Sciences (SPSS, version 24) software. The coded and cleaned data were used to calculate frequencies and proportions of the socio-demographic characteristics of the 1531 PLA trainees and responses on PLA and empowerment questions. The mean of all the questions for every domain of PLA and empowerment was calculated and their corresponding frequencies established to determine the value coded to a domain for all the 1531 PLA trainees.

To establish the level of each domain of empowerment and PLA and to know whether there is PLA and empowerment achieved or not for every trainee, a Likert scale code was recorded. 'Very good' and 'good' was equated to *Yes* taking up the mean value of 1 through 2. 'Somehow*'* and 'No*'* was equated to *No* taking up the mean values of 2.01 through 4. Then the percentage frequencies of *Yes* and *No* was calculated for all the domains of empowerment and

PLA. *Yes* is empowerment and PLA and *No* is no empowerment achieved and PLA not effectively conducted. The 1531 trainees existed as 30 groups of 50 households except for 1 group that had 51 households and 1 group of 30 CHVs. Chi-square analysis was used to establish the groups for every category of socio demographic characteristics that were highly empowered through PLA and to verify the association between PLA domains and empowerment variables. Odd Ratio, 95% CI and p-values for each PLA domain were obtained using binary logistic regression for each empowerment. For all analyses, $P \leq 0.05$ was considered statistically significant.

RESULTS

The socio-demographic characteristics of the CHVs and all the 1531 PLA trainees (trained CHVs inclusive)

A total of 1531 Nyalenda B community members were purposively chosen and went through PLA (CHVs inclusive) on SMWA, responded to the questions on empowerment and PLA assessment. Table 1 presents the socio-demographic characteristics of the study participants.

Based on the data the community members aged between 26-35 years developed power with more significantly relative to the rest of the age categories (48.3%; $P=0.008$), the females developed power within more significantly as compared to the males (79.0%; $P<0.0001$) and the mother, in comparison to other family members, developed all categories of empowerment significantly (power within 68.9%; $P=0.002$, power with 68.2%; $P< 0.0001$, power over 70.3%; $P<0.0001$). Furthermore the community members with secondary level of education were more significantly empowered in all categories in comparison to other levels of education (power within 35.0%; $P=0.025$, power with 34.2%; $P<0.0001$, power over 34.2%; $P<0.0001$) and the self-employed developed power with more significantly than others in their respective categories (52.5%; $P=0.002$). Likewise those that had an average income of less than Ksh 5000 developed power with significantly (70.0%; $P=0.02$) and those that spent less than Ksh500 on purchasing drugs developed power with and power over significantly (power within 64.7%; $P=0.008$, power over 64.3%; $P=0.025$) in comparison to the relevant categories. Finally the Christian protestant significantly developed power over (43.9%; $P<0.0001$) and caretakers of children below 12 years developed all categories of empowerment with a significance (power within 37.7%; $P=0.018$,

power with 38.5%; $P<0.0001$, power over 39.2%; $P=0.007$) as compared to other relevant categories.

PLA conduct

The trainer highlighted self-medication with the antimicrobial problem statement and allowed the team to discuss it freely. All the 100% members were not aware that buying medicine from a pharmacy without a prescription is self-medication76.7% assumed headache is malaria, 80% indicated that any pain in the chest after a cold period is pneumonia, 83.3% agreed that after taking antimalarials and the headache persists then typhoid should be managed, 53.3% agreed that *Mara Moja* or *Sona Moja* treats malaria and 60% said amoxicillin and cotrimoxazole were good for management of common cold. 100% of the members had used self-medication for themselves or their family members in the last 3 months. The team was then trained on the effect of SMWA to the individual and to the community by highlighting the nature and the effect of antimicrobials' prolonged use, over dosages, under dosages, reuse, misuse, and missed diagnosis.

The team was given the opportunity to ask questions and to add their views. One of the team members said, "*It is advertised through the radio that we use Mara Moja for severe headache and it controls my headache and when the headache keeps on recurring then I consult with the pharmacy.* Another member interjects, *"Normally that is just malaria and in my case I just buy AL"* and yet another one said, *"and when it continues then it is typhoid".* Another member said, *"Amoxyl works best for me when I get a common cold".* There were similar statements from some members. Such statements were freely discussed and a consensus obtained.

The team was then split into 6 FGD groups and each group identified the chain of events that leads to self-medication with antimicrobials, most important root causes, and solutions to SMWA. Direct ranking of the most important root causes (they were encouraged to have "changeability" in mind, from most changeable to least changeable) and potential strategies addressing the root causes of SMWA was done. It was established through FGD that reasons for SMWA are ignorance, high cost of prescription medicine, unavailability of time, distance from preferred the health facilities, wrong information or advice, accessibility to self-medication, fear of HIV status exposure at the facility. The solutions to these problems as enumerated included community mobilization on SMWA, improvement of the management of the local health

facilities and the attitude of the health personnel towards efficient and effective service and strengthening of the community health strategy.

Structural modification

The study established that the main barrier to the community mobilization on SMWA was the community perception of their local health facility services which was poor services. They highlighted the poor attitude of the health personnel towards efficient and effective service, inadequate examination equipment, limited types of drugs for the treatment of malaria and other infections and they hoped for 24 hour system of operation. They also hoped that HIV screening be made voluntary, counseling services be put in place and that health education services be provided at the facility. This called for mitigating for the barriers or structural intervention. A feedback report was given to the local health facility management representatives. The management representatives did not take up these comments positively and blamed the CHVs for misinforming the public. This called for redirecting efforts to activities that may be more effective. A conflict management meeting was then organized by the researcher, the CHEW for the Nyalenda B CHVs and the health management representatives. The CHVs encouraged themselves to continue with the household health promotion and especially community mobilization on self-medication with antimicrobials. A 5-monthly Integrated Health Outreach Services (IHOS) within Nyalenda B was planned for and implemented to fill in the gap for the community perception of poor health service at their local facility and to mitigate for time factor and distance. The IHOS reached a total of 575 people of which 154 were children below 5 years.

Training outcome for CHVs and all the 1531 PLA trainees

The percentage frequency of 'YES' in the CHV group for participatory interaction is 96.4%, Participatory evaluation is 92.4%, Flexible learning and listening is at 95.3%, power within is 83.5%, power with is 71.8%, power over is at 55.6% hence the level of PLA and Empowerment achieved for every domain. The percentage frequency of 'YES' in the 1531 PLA trained group for participatory interaction is 100%, Participatory evaluation is 96% Flexible learning and listening is 96%, power within is 96%, power with is 94%, power over is 88% hence the level of PLA and Empowerment achieved for every domain. The percentage frequency for power over is comparatively low. The percentage frequency of power over components reveals that, even after

the PLA training, 20.4% of the trainees did not develop the ability to influence and coerce the health facility to serve them efficiently, 34.6% were not aware that they were represented at the Health Facility Management Board, 51.4% did not understand how community health strategy operates, 23.9% did not know how to access their health rights, opportunities and services but 85.3% were positive that they can access their health rights, opportunity and services through the health facility. Therefore, to realize better power over results the community health strategy should be strengthened.

The association between PLA domains and all empowerment domains for all the 1531 PLA trainees

In order to establish the association between PLA domains and all empowerment domains, the Odd Ratios, 95% CI and p-values were obtained using binary logistic regression. The results shows that flexible learning and listening may increase power within by 5 times (OR=5.361, 95% CI=3.101-9.268 *P*<0.0001,), power with by 6 times (OR=6.160, 95% CI=3.437-11.039, *P*<0.0001) and power over by 2 times (OR=2.261, 95% CI=1.293-3.954. *P*<0.0001), Participatory evaluation may increase power within by almost 8 times (OR=7.711, 95% CI=5.184-11.459, *P*<0.0001), power with by 5 times (OR=5.012, 95% CI=3.375-7.443, *P*<0.0001), power over by more than 3 and a half times (OR=3.618, 95% CI=2,375-5,509, *P*<0.0001), Participatory interaction may increase power within by almost 8 times (OR=7.823, 95% CI=4.798-12.763, *P*<0.0001), power with by 8 and a half times (OR=8.610, 95% CI= 4.987-14.866 *P*<0.0001,), power over by 4 times (OR=4.003, 95% CI=2.325-6.693, *P*<0.0001). (Table 2).

The strength of association between all the PLA domains and power over is relatively lower as compared to other domains of empowerment

DISCUSSION

In this study, our use of a PLA approach and methodology enabled community health volunteers and the household representatives to engage meaningfully and contribute to the identification of self-medication with antimicrobials' root causes and control measures. In the process, they were also empowered with the tools for exercising personal control over their health habits (Bandura, 1994). The PLA, if well-facilitated can have an integrating function that prompts broader social

connections and enables empowerment. A pilot study in Kisumu a city in Kenya explored the utility and effectiveness of participatory action research as an approach for youth-led peace building in marginalized communities and proved it a valuable methodological approach. It enabled quick learning of skills, direct uptake of systematic challenges and use of minimum resources on implementation (Amambia et al., 2018). PLA initiatives based on strengthening self reliance and sustainability and undertaken in the Little Karoo, South Africa and Odibo, Namibia, as well as in various communities in Zambia, and on numerous RDP capacity-building training initiatives in the Northern Cape Province. South Africa proved to be appropriate strategy for development(Wetmore & Theron, 1998). Three key elements that distinguished our approach from the conventional health education is, flexible learning and listening, participatory evaluation, and participatory interaction.

Our key finding regarding access to the community is that expanding the research team to include and train CHVs in PLA made it possible to involve the households in a meaningful participation and to generate a wider sample. The CHVs and the households relate well, understand and respect each other, thus further pointing out that peer researchers are an essential bridge for better results. The trained community peer life circumstances and characteristics closely resembled those of the target population thereby giving them a higher opportunity of influencing acceptance of health messages (Janz et al., 1996). The findings of the current study are consistent with those of another one in which a cluster-randomized controlled trial in Nepal showed an effect of a participatory intervention with women's groups on birth outcomes (Dama, 2004) The intervention in that study worked very well with peer researchers leading to improved birth outcomes through a low cost, potentially sustainable and scalable, participatory intervention. A systematic review of 24 studies that was aimed at examining the magnitude of the impact of community engagement (CE) on health and health inequalities among disadvantaged populations showed that one of the factors that facilitated CE was PLA and one of the elements of the programme success was the incorporation of the cultural competent CHWs in the research protocol. These studies were distributed into different areas of which 17 were conducted in the United States, and there was one each in Canada, Bangladesh, Africa, China, the United Kingdom, Iran, and India (Cyril, J.Smith, Possamai-Inesedy, & Renzaho, 2015)

Our key finding regarding self-medication empowerment is that a PLA methodology enabled increment of all domains of empowerment on the part of CHVs and the community throughout the process of the research activities. All domains of PLA were achieved at very high level and this is also true for empowerment except for power-over which was achieved but at comparatively lower level. The association between PLA domains and all empowerment domains is very strong but the strength of association between all the PLA domains and power over is relatively lower as compared to other domains of empowerment. A study on the Impact of Participatory Learning and Action Women's Groups Alone or Combined with Cash and Food Transfers on Maternal Agency in Rural Nepal (Lu Gram, 2018) ruled out larger impacts for PLA alone, comparable in size to the impact observed in the PLA and cash arm on improvement of maternal agency (power-over). It has also been recognized that community mobilization strategies must be complemented by structural interventions to bring about comprehensive changes in the social, economic, legal and political structures that led to disempowerment in the first place (Asthana & Oostvogels, 1996; Kerrigan, 2003). This is supported by the previous theoretical views (Kabeer, 2003; Sen, 1999) which emphasize moving beyond empowerment for the individual, to welfare enhancement for achieving lasting social transformation.

CONCLUSION

The PLA enabled the community to alter their perspectives as a result of learning from others. Such major shifts in perspective are not readily made, but this is where PLA comes into its own, managing divergent experiences and potentially divisive views. Participation is typically an adjunct to implementation rather than as a primary intervention. In the transparent, democratic, and dialogic PLA environment, the community may gain an entirely new perspective which prompts them to shift position from long-held patterns of belief or behavior.

The PLA enabled the community to work out a guideline for control of self-medication with antimicrobials which is suitable for them. Another key strength of this study was the commitment and the CHVs motivated as co-researchers. The PLA training is not limited to use in a single research project; once trained, peer researchers can apply PLA to any primary healthcare research topic. Ultimately, this builds the capacity of communities to engage in rigorous participatory research. The PLA, if well-facilitated, can have an integrating function that prompts broader social connections and enables empowerment at a low cost.

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546 **Table 1: Socio-demographic characteristics of 1531people (household representatives [hhr] and CHVs) SMWA PLA trained**
547 **by all empowerment domains**

Socio demographic characteristics	Power within		P value	Power with		P value	Power over		P value
	Yes	No		Yes	No		Yes	No	
Age									
15-25	367(85.3)	63(14.7)	0.603	293(68.1)	137(31.9)	0.008	262(60.9)	168(39.1)	0.029
26-35	600(83.1) 46.9*	122(16.9)		531(73.5) 48.3*	191(26.5)		398(55.1) 46.7*	324(44.9)	
36-50	247(82.9)	51(17.1)		227(76.2)	71(23.8)		153(51.3)	145(48.7)	
above 50	65(80.2)	16(19.8)		49(60.5)	32(39.5)		39(48.1)	42(51.9)	
Gender									
Male	268(77.2)	79(22.8)	<0.0001	251(72.3)	96(27.7)	0.816	195(56.2)	152(43.8)	0.816
Female	1011(85.4)	173(14.6)		849(71.7)	335(28.3)		657(55.5)	527(44.5)	
Marital status									
Single	286(84.1)	54(15.9)	0.072	241(70.9)	99(29.1)	0.121	198(58.2)	142(41.8)	0.134
Married	876(82.5) 79.0*	186(17.5)		766(72.1) 77.2*	296(27.9)		576(54.2) 77.2*	486(45.8)	
Divorced	18(100.0)	0(0.0)		12(66.7)	6(33.3)		13(72.2)	5(27.8)	
Widowed	77(91.7)	7(8.3)		56(66.7)	28(33.3)		53(63.1)	31(36.9)	
Separated	22(81.5)	5(18.5)		25(92.6)	2(7.4)		12(44.4)	15(55.6)	
Family status									
Father	252(80.0)	63(20.0)	0.002	233(74.0)	82(26.0)	<0.0001	174(55.2)	141(44.8)	<0.0001
Mother	881(86.0) 68.9*	144(14.0)		750(73.2) 68.2*	275(26.8)		599(58.4) 70.3*	426(41.6)	
Son or Doughier	70(78.7)	19(21.3)		62(69.7)	27(30.3)		38(42.7)	51(57.3)	
Others	76(74.5)	26(25.5)		55(53.9)	47(46.1)		41(40.2)	61(59.8)	
Educational level									
Illiterate	74(81.3)	17(18.7)	0.025	63(69.2)	28(30.8)	<0.0001	65(71.4)	26(28.6)	<0.0001
Read and write only	130(90.3)	14(9.7)		127(88.2)	17(11.8)		108(75.0)	36(25.0)	
Primary school	304(81.3)	70(18.7)		278(74.3)	96(25.7)		202(54.0)	172(46.0)	
Secondary school	448(81.5) 35.0*	102(18.5)		376(68.4) 34.2*	174(31.6)		291(52.9) 34.2*	259(47.1)	

College level	323(86.8)	49(13.2)		256(68.8)	116(31.2)		186(50.0)	186(50.0)	
Occupation									
Student	101(82.1)	22(17.9)	0.392	96(78.0)	27(22.0)	0.002	71(57.7)	52(42.3)	0.071
Government employee	68(87.2)	10(12.8)		56(71.8)	22(28.2)		54(69.2)	24(30.8)	
self employed	651(84.9) 50.9*	116(15.1)		577(75.2) 52.5*	190(24.8)		432(56.3) 50.9*	335(43.7)	
Employed by a private business	107(83.6)	211(6.4)		87(68.0)	413(2.0)		66(51.6)	62(48.4)	
Unemployed	352(80.9)	83(19.1)		284(65.3)	151(34.7)		229(52.6)	206(47.4)	
Average monthly income									
less than 5,000	897(85.0) 70.1*	158(15.0)	0.065	770(73.0) 70.0*	285(27.0)	0.020	586(55.5) 68.8*	469(44.5)	0.868
5000 to 10, 000	264(80.0)	66(20.0)		218(66.1)	112(33.9)		187(56.7)	143(43.3)	
> 10, 000	118(80.8)	28(19.2)		112(76.7)	34(23.3)		79(54.1)	67(45.9)	
Approximate drug expenditure									
< 500	827(82.0) 64.7*	182(18.0)	0.008	745(73.8) 67.7*	264(26.2)	0.025	548(54.3) 64.3*	461(45.7)	0.183
500 to 1, 000	193(82.8)	40(17.2)		165(70.8)	68(29.2)		142(60.9)	91(39.1)	
> 1, 000	259(89.6)	30(10.4)		190(65.7)	99(34.3)		162(56.1)	127(43.9)	
Religion									
Christian Orthodox	180(83.7)	35(16.3)	0.056	161(74.9)	54(25.1)	0.063	156(72.6)	59(27.4)	<0.0001
Christian protestant	640(86.1) 50.0*	103(40.9)		517(69.6) 47.0*	226(30.4)		374(50.3) 43.9*	369(49.7)	
Muslim	27(77.1)	8(22.9)		23(65.7)	12(34.3)		21(60.0)	14(40.0)	
Christian catholic	378(79.9)	95(20.1)		344(72.7)	129(27.3)		254(53.7)	219(46.3)	
Others	54(83.1)	11(16.9)		55(84.6)	10(15.4)		47(72.3)	18(27.7)	
Health condition of the drug consumer									
Pregnant	8688.7	1111.3	0.018	81(83.5)	16(16.5)	<0.0001	62(63.9)	35(36.1)	0.007
Breast feeding	154(78.2)	43(21.8)		139(70.6)	58(29.4)		107(54.3)	90(45.7)	
Has a chronic disease	77(77.8)	22(22.2)		59(59.6)	40(40.4)		56(56.6)	43(43.4)	
Child under 12	482(86.2)	77(13.8)		423(75.7)	136(24.3)		334(59.7)	225(40.3)	

years	37.7*			38.5*			39.2*		
13 -59 years	440(82.2)	9517.8		361(67.5)	174(32.5)		265(49.5)	270(50.5)	
> 59 years	40(90.9)	4(9.1)		37(84.1)	7(15.9)		28(63.6)	16(36.4)	

NOTE: **1:** Values in bracket (), are % socio-demographic characteristic within a specified category. **2:** Values with * are % socio-demographic characteristic within a specified category of empowerment.

Table 2: The association between PLA domains and all empowerment domains as outcome variables for 1531 SMWA PLA trainees in Nyalenda B Ward

	Power within			**Power with**			**Power over**		
	P	**OR**	**95%CI**	**P**	**OR**	**95%CI**	**P**	**OR**	**95%CI**
Flexible learning and listening	<0.0001	5.361	3.101-9.268	<0.0001	6.160	3.437-11.039	<0.0001	2.261	1.293-3.954
Participatory evaluation	<0.0001	7.711	5.184-11.459	<0.0001	5.012	3.375-7.443	<0.0001	3.618	2,375-5,509
Participatory interaction	<0.0001	7.823	4.798-12.763	<0.0001	8.610	4.987-14.866	<0.0001	4.003	2.325-6.693