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Abstract

To counter the high unmet for family planning in urban areas of Sindh province, Pakistan, Greenstar Social Marketing began implementation of The Challenge Initiative (TCI) in collaboration with governments' departments of Population Welfare and Health in eight urban districts of Sindh province. This study aimed to assess the impact of TCI's Community Health Volunteers (CHVs) on public sector service provision of family planning services in eight urban districts of Sindh province, Pakistan. Contraceptive Logistics Management Information System (cLMIS) and Department of Health Information (DHIS) were used to obtain monthly contraceptive data from June 2022 to December 2024. CHVs began implementation at different time-points in each district, starting from January 2023 to October 2023, when CHVs became operational in all the eight districts. Descriptive statistics and two sample t-test were used for data analysis. CHVs significantly improved family planning service provision, particularly for short- and long-acting methods at the facility level, with greater impact observed in Department of Health facilities. The study provides preliminary evidence on the effectiveness of CHVs on increasing public sector service provision of contraceptives, particularly for DOH facilities. CHVs bridge the gap between the community and the facility, particularly in areas uncovered by government's existing mobilization staff.

Keywords: community health volunteers; The Challenge Initiative; urban family planning programmes

1. Introduction

There are a total of 15.3 million women of reproductive age (WRA) in Sindh province, Pakistan [1]. However, to obtain demand and need estimates for modern contraception, 5.6 million women are not counted in the demand estimates as the Pakistan Demographic and Health Survey (PDHS) only interviews married women of reproductive age for questions pertaining to fertility and family planning [1,2]. Of the remaining 9.7 million women of reproductive age, all of whom are married women, 49 percent (4.7 million WRA) women have a need for modern contraception [1,2]. Approximately, 50 percent (2.4 million WRA) of this need has been met by modern contraceptive methods while the remaining 2.3 million WRA report an unmet need for family planning [1,2]. The

method mix for users was heavily tilted towards male condoms and female sterilization, with both methods accounting for 73 percent of all methods in the method mix, with only six percent women reporting usage of long-acting and reversible contraception (LARCs) i.e., Implants and Intra-uterine Devices (IUDs) [2]. Low uptake of LARCs is particularly counterintuitive as need for limiting future births accounts for 60 percent of total need [2]. Furthermore, women with need for modern family planning who are currently not using a modern method are at risk for unsafe abortions and unintended pregnancies, and are hence asked about their future intention to use a family planning method [1–3]. Of those women reporting an unmet need, 1.3 million women reported intentionality to use a family planning method while one million women were reported as non-intenders [1,2].

Women reporting intention represent low-hanging fruits for family planning organizations working in Sindh, Pakistan, and can easily be converted from intenders to users by approaching them with potential modern contraceptive methods [4,5]. Women reported as non-intenders can be converted into intenders and subsequently users through comprehensive counseling on their family planning options and connecting them with service delivery points [4,5]. Community health volunteers (CHVs) can play a critical roles in converting both of these groups into users while also focusing on LARCs for women who have a need for limiting [4–10].

This paper describes a government-led, cost-effective, and scalable service delivery model to address unmet need for modern contraceptives among women in eight urban districts of Sindh province, Pakistan. The study presents preliminary evidence on whether the CHV intervention has any impact on family planning uptake in urban public sector facilities. The findings from this study can inform prioritization and scale-up of CHV interventions specifically for improving family planning uptake. The study will additionally explore the impact of CHVs on uptake of short-acting methods, LARCs, permanent methods (PM), outpatient clients, post-partum family planning uptake (PPFP), and post-abortion family planning uptake (PAFP).

1.1. Program Description

The Challenge Initiative (TCI) employs a scaling model based on successful practices and lessons from its predecessor, the Urban Reproductive Health Initiative (URHI), which was active in India, Kenya, Nigeria, and Senegal from 2010 to 2015 [8,9,11–19]. Since 2022, TCI has operated in Pakistan as a scaling intermediary to help provinces enhance their health systems and implement high-impact interventions (HIIs) in family planning (FP). TCI's approach involves working closely with provincial and district governments that seek to partner with them, provided these governments show political and financial commitment to achieving their family planning objectives, in line with the larger provincial and national FP2030 commitments [20]. The concerned government departments of Health and Population Welfare in consultation with TCI decide which HIIs to implement, while TCI offers technical and managerial support, as well as gap funding, to help with planning and building government capacity for effective implementation and coordination. TCI focuses on both expanding the reach of interventions (horizontal scaling) and embedding them into government policies, budgets, and procedures (vertical scaling). Over two years, 15 district governments have collaborated with TCI Pakistan, resulting in an estimated 362,377 additional users for family planning. Moreover, the selected 15 districts account for 28 percent of the total country population and 53 percent of the country's total urban population [1]. The TCI program is led globally by the Johns Hopkins Center for Communication Programs in partnership with the Gates Institute for Population and Reproductive Health at the Johns Hopkins Bloomberg School of Public Health while implementation in Pakistan is led by Greenstar Social Marketing (GSM) [8,9,11–19,21]. TCI Pakistan uses various strategies to support provinces in adopting and integrating HIIs into their public health systems. These strategies include promoting advocacy and accountability, strengthening provincial and district leadership and management, providing coaching, and improving data quality and utilization. The TCI HII being focused on in this study is Community Health Workers, specifically, Community Health Volunteers.

1.1.1. TCI HII - Community Health Workers (CHWs)

In 1994, Pakistan launched the National Program for Family Planning, commonly known as the "Lady Health Workers Program" [22,23].   This initiative features two types of Community Health

Workers: Lady Health Workers (LHWs) and Family Welfare Assistants (FWAs) [22,23]. Lady Health Workers (LHWs) are employed by the Department of Health and focus on raising awareness and improving access to primary healthcare services provided by Lady Health Visitors (LHVs) [22]. Each LHW is tasked with educating 1,000 to 1,500 people in her community [22]. They conduct door-to-door visits to promote maternal, newborn, and child health (MNCH) and family planning, provide one-on-one counseling, and distribute non-invasive family planning items like condoms and pills [10,22–24]. They also make referrals to health centers managed by LHVs and other healthcare facilities [22,23]. Additionally, LHWs receive training in gender-responsive counseling and service delivery [22–25].

Family Welfare Assistants (FWAs) have a similar role but are supervised by the Population Welfare Department (PWD) [22,26]. They offer one-on-one counseling to married women of reproductive age (MWRAs), promote demand for childbirth spacing and family planning within the community, and refer individuals to Family Welfare Workers (FWWs), who operate like LHVs [22,26]. TCI Pakistan implements its CHW HII through either government's LHWs/FWAs or if they are not available, by hiring CHVs as volunteers who are paid a stipend for conducting demand-generation activities in their catchment areas. To implement this HII, the TCI program has laid out five specific steps [27]:

Step 1: Identify and Assess CHVs for Family Planning Services

CHVs are identified who are already trained in family planning but may need further coaching. They often require additional, in-depth training to enhance their skills, ensuring they can deliver high-quality family planning counselling and be effectively integrated into Basic Health Units and Family Health Centres for appropriate referrals.

Step 2: Provide Comprehensive Training for CHVs

Consult with the identified candidates in your district to assess their current knowledge and comfort level with family planning counselling. Based on this assessment, targeted training is offered to improve their skills in areas such as family planning methods, interpersonal communication, counselling, referral processes, and data recording and collection.

Step 3: Equip CHVs with Necessary Resources

CHVs perform door-to-door visits to generate demand and raise awareness about family planning and birth spacing, and refer clients to their respective clinics for consultation and service provision. TCI ensures that CHVs receive the essential equipment and supplies they need. Additionally, they are provided with information, education, and communication (IEC) materials in local languages to support CHVs in their outreach and demand-generation efforts.

Step 4: Implement Supportive Supervision

Bi-monthly and quarterly visits are conducted to review the accuracy of CHVs' data and provide feedback on their counselling and service delivery. Organize monthly meetings for all CHVs at their assigned medical facilities to evaluate their performance, review data related to family planning services, and address any challenges they face.

Step 5: Utilize CHVs for Creative Demand Generation

CHVs were also trained to lead discussion groups within the community to reinforce family planning information provided through various media like radio programs, TV dramas, and theatre performances.

2. Materials and Methods

2.1. Study Design

The study used a secondary data design using multiple datasets on the number of family planning clients served by intervention districts and facilities.

2.2. Data Collection

Data were obtained from the contraceptives Logistics Management Information System (cLMIS) which is a Management Information System (MIS) developed for tracking and managing logistics and dispensation of contraceptive commodities [28,29]. Contraceptives being supplied throughout the country through the Central Warehouse was recorded using manual record keeping, with all its inadequacies and ensuing errors and delays on the national scale, have been replaced by the online

system of "the Contraceptives Logistics Management Information System (cLMIS)" developed in cooperation with the Ministry of National Health Services Regulation and Coordination, the Provincial Departments of Health (DOH) and Population Welfare (PWD) with support of the USAID Deliver Project [28]. To regularize the flow of logistics, cLMIS was launched in Pakistan in 2010 and gradually had spread through most of the country (143 districts) by October 2012 [29]. Since the cLMIS contains data on units dispensed including data on permanent contraceptive methods i.e., tubal ligation and vasectomies, it can be used to infer programmatic impact as well [28,29]. The database contains method-wise data on Injectables, Emergency Contraceptive (EC) pills, Condoms, Oral Contraceptive Pills, Intra-uterine Device (IUDs), Implants, Tubal Ligation, and Vasectomies. Aggregated variables were created for short-acting methods (SAMs), LARCs, and permanent methods (PMs).

The cLMIS provides monthly dispensation data from all government facilities in eight TCI intervention districts in Sindh, namely, Hyderabad, Karachi Central, Karachi East, Karachi South, Karachi West, Keamari, Korangi, and Malir. Monthly data were obtained from June 2020 to December 2024; CHVs began implementation at different time-points in each district, starting from January 2023 to October 2023, when CHVs were operational in all the eight districts.

Population Welfare Department is the primary custodian of cLMIS; hence, they enter their facilities' dispensation data directly into the system while Department of Health's performance is integrated into cLMIS through their primary MIS called the Department of Health Information System (DHIS).

Cumulative district-level consumption for eight districts alongside facility-level clients served for PWD was extracted from the cLMIS while DHIS was used to extract facility-level clients served for DoH. 420 facilities (DoH 258, PWD 162) are reporting into the district-level dataset without an option to segregate result by facility; in 197 facilities (DoH 107, PWD 90), CHVs are currently operational which is 47 percent of the total (DoH 47%, PWD 56%). Considering the approximately 50 percent ratio of implementation, facility-level data were extracted as the district-level estimates are expected to be dilated by the non-intervention facilities. In the facility-level dataset, data on permanent methods was not available, however, data were available on outpatient clients, post-abortion family planning clients, and post-partum family planning clients for DoH facilities.

A new variable 'CHV intervention' tracing operationality of CHVs was added to the dataset marking months without CHV implementation as '0' and months after CHVs began implementation as '1'. Since cLMIS reports on the number of commodities, data are extracted on each contraceptive method separately, and is converted into clients using the Couple-Years of Protection (CYP) conversion factor for each contraceptive method.

Additionally, data on CHVs' sociodemographic characteristics were compiled from the programmatic database on CHVs.

2.3. Data Analysis

Descriptive statistics were used to analyze the sociodemographic characteristics of the CHVs. To infer the impact of CHVs on service provision, two-sample t-tests were conducted to compare the monthly average clients of each method and aggregated variables between pre-CHV intervention and post-CHV intervention. This comparison was done at the facility-level and the department-level.

3. Results

3.1. Sociodemographic Characteristics

A total of 210 female CHVs had been recruited into the program as of July 2024. The mean age of the CHVs was 36 years old (SD= 10) (Table 1). 48 percent (n= 87) CHVs had completed their secondary education, 42 percent (n= 77) had completed their high school education, seven percent (n= 13) had attained an undergraduate degree, and three percent (n= 5) had attained a master's degree. With regards to their distribution across the districts, 14 percent (n= 29) of the CHVs were operating in Hyderabad, 11 percent (n= 23) CHVs were operating in Karachi Central, 12 percent (n= 25) were operating in Karachi East, 13 percent (n= 27) were operating in Karachi Malir, 12 percent (n= 25) were operating in Karachi South, 13 percent (n= 27) were operating in Karachi West, 12 percent

(n= 26) were operating in Karachi Korangi, and 13 percent (n= 28) were operating in Karachi Keamari. Lastly, the average number of household visits conducted by a CHV each month were 81 (SD= 39).

Table 1. Sociodemogr6aphic Characteristics of CHWs (n= 210).

Characteristic		Frequency/Mean	Percentage/SD
Age		35.95	9.91
Highest Level of Education Attained			
	Secondary	87	47.8%
	High School	77	42.3%
	Secondary	87	47.8%
	High School	77	42.3%
	Undergraduate	13	7.14%
	Masters	5	2.75%
District			
	Hyderabad	29	13.81%
	Karachi Central	23	10.95%
	Karachi East	25	11.9%
	Karachi Malir	27	12.86%
	Karachi South	25	11.90%
	Karachi West	27	12.86%
	Karachi Korangi	26	12.38%
	Karachi Keamari	28	13.33%
Average Number of Monthly Household Visits		81.25	39

3.2. Comparison of Average Monthly Clients

Tables 2–8 present the results of two-sample t-tests that compare the monthly average clients at the district- and facility-level before and after the introduction of CHVs.

Table 2. District-level Comparison of Average Monthly SAM Clients.

	Pre-CHV	Post-CHV	Difference	p-value
PWD	4,141.39	3,445.67	-17%	0.0000
DOH	1,359.00	2,198.35	62%	0.0002
Overall	3,029.85	2,820.14	-7%	0.1526

Table 3. District-level Comparison of Average Monthly LARC Clients.

	Pre-CHV	Post-CHV	Difference	p-value
PWD	240.07	379.42	58%	0.0000
DOH	100.29	190.34	90%	0.163
Overall	201.79	286.03	42%	0.0017

Table 4. District-level Comparison of Average Monthly PM Clients.

	Pre-CHV	Post-CHV	Difference	p-value
PWD	85.15	96.15	13%	0.3306
DOH	26.43	48.18	82%	0.0016
Overall	77.58	90.41	17%	0.203

Table 5. District-level Comparison of Average Monthly Clients.

	Pre-CHV	Post-CHV	Difference	p-value
PWD	4,243	3,871	-9%	0.0277
DOH	1,377	2,389	73%	0.0000
Overall	3,111	3,132	1%	0.203

Table 6. Facility-level Comparison of Average Monthly SAM Clients.

	Pre-CHV	Post-CHV	Difference	p-value
PWD	275.58	346.60	26%	0.0000
DOH	58.17	105.16	81%	0.0000
Overall	150.55	190.85	27%	0.0000

Table 7. Facility-level Comparison of Average Monthly LARC Clients.

	Pre-CHV	Post-CHV	Difference	p-value
PWD	4.54	9.53	110%	0.0000
DOH	3.74	6.63	77%	0.0000
Overall	4.08	7.67	88%	0.0000

Table 8. Facility-level Comparison of Average Monthly Clients for Outpatient, PPFP, and PAFP.

	Pre-CHV	Post-CHV	Difference	p-value
OPD	2,974	3,154	6%	0.3506
PPFP	18.12	31.41	73%	0.0000
PAFP	2.65	5.06	91%	0.0000

3.2.1. District-Level Assessment

At the district level, the study found minimal impact of CHVs on overall and PWD's service provision of SAM. However, for DOH, the study found that CHV implementation increased service provision for SAM by 62 percent ($p<0.01$).

Assessing the impact of CHVs on service provision of LARCs, the study found increments across both departments and overall, as well. A statistically significant increase of 58 percent ($p<0.000$) was observed for PWD, a substantive increase of 90 percent ($p>0.05$) was observed for DOH, and an overall 42 percent ($p<0.01$) increase in LARC service provision was observed.

While permanent methods were not a focus for CHVs, minor improvements of 13 percent ($p>0.05$) and 17 percent ($p>0.05$) were noted for PWD and at the overall level, respectively. Statistically significant impact of 82 percent ($p<0.01$) for DOH.

At the district-level, the study found no impact of CHVs at the overall level and on PWD's average monthly clientele. However, for DOH, the study found that CHVs improved overall service provision by 73 percent ($p<0.000$).

3.2.2. Facility-Level Assessment

At the facility level, the study found statistically significant impact across the board with improvements of 26 percent ($p<0.000$), 81 percent ($p<0.000$), and 27 percent ($p<0.000$) for PWD, DOH, and combined, respectively.

For LARCs, the study found statistically significant impact across PWD, DOH, and Overall. While the magnitude of the change is large, it is pertinent to note that LARC service provision at the facility remained under ten per month at all three levels.

DOH facilities provide a wider array of healthcare services, notably, outpatient and maternal care. While not directly focusing on these services, CHVs had a spillover effect on PPFP and PAFP clientele increasing them by 73 percent and 91 percent, respectively. It is pertinent to note though that the magnitude of PAFP clients remained under ten. The study also found a minor albeit statistically insignificant impact on outpatient clients, as well.

4. Discussion

The objective of this study was to emphasize upon the impact of The Challenge Initiative's community health volunteers on public sector service provision of modern family planning services in urban Sindh, Pakistan. This is the first study in Pakistan to assess the impact of CHVs on government departments' service provision.

Since there are multiple data systems operating in public facilities of Sindh, varying mainly by department, data were extracted from both systems to corroborate the findings [28]. Another reason the study conducted a multi-tiered analysis is to account for poor data quality in both DHIS and cLMIS with limited oversight and monitoring of the reported data, particularly from the DOH side [30–32].

The study found that at the district-level, the impact of CHVs was diluted at the overall level and for PWD due to middling facility coverage of 47 percent and 56 percent, respectively. This is largely due to short-acting methods which account for most of the method mix and also suffer from constant stock-outs due to high demand and poor supply chain management [28,33,34]. Another reason why limited impact was observed for PWD facilities was that the population welfare department is mandated to provide family planning services, and is reporting high client volumes at baseline, potentially leading to saturation [35]. Contrastingly, the study found significant improvements across the board for DOH at the district- and the facility-level. DOH has a broader mandate, and their staff is often engaged in outreach activities for immunization, dengue, outbreaks, and any other health campaigns. Despite the fact that DOH's lady health worker program was initiated with the goal of increasing contraceptive prevalence, however, these shifting priorities have led them to focus on all health areas except for family planning [22,36]. This created a gap in demand-generation and community mobilization which was filled by CHVs leading to pronounced gains.

The study's results echo findings from previous studies that explored the impact of community health volunteers or workers on contraceptive service provision. Studies conducted in Madagascar, Afghanistan, Bangladesh, and Indonesia reported improved contraceptive uptake due to community health worker (CHW) interventions [37–40]. A study conducted by the Sukh initiative in Karachi also reveals that CHWs helped in increasing modern contraceptive usage which contributed to improved CPR [41]. A study with a similar study design and intervention in Ghana reporting significant improvements in the governments' service provision of contraceptives [42]. A systematic review found that the CHW intervention leads to greater diversity in the method mix with an increased number of referrals for long-acting methods [43]. This study reported similar findings with a significant increase in LARC clients after the introduction of CHVs. This also proved to help in strengthening the health system in low and middle-income countries (LMICs) as CHVs are often used to overcome the shortage of healthcare staff to contribute to the improvement of primary health services including but not limited to reproductive health [44].

The study's findings suggest that CHVs play an important role in overcoming barriers such as misconceptions, lack of awareness, and access to facilities for the use of contraceptives especially for the methods that require counseling and follow-up. This study found a statistically significant increase in the LARCs, akin to studies in Ethiopia and Nigeria which also reported an increase in LARC use with CHW involvement though they are not directly involved in its provision [45]. The impact of CHWs can be maximized to achieve FP goals by providing them with the necessary training and supervision [46].

4.1. Limitations

The study provides critical insights into the impact of CHVs on government's service provision of family planning services, however, there are several limitations inherent to the study's design. The study utilized secondary data from the cLMIS and the DHIS which are government's official data sources for assessing family planning performance. Despite this, these systems suffer from limited oversight, inconsistent data entry, quality issues, and under- or over-reporting.

There was no comparison group used in the study. The TCI intervention targeted the most urban districts in Sindh province which left only rural districts in the province which do not serve as adequate comparators for the TCI districts. At the facility level, the coverage of CHVs vary significantly from one district to another with CHVs being operational in more than 90 percent of the facilities in some districts which does not leave a sufficient number of facilities to be used as comparators. Furthermore, due to the lack of covariates and controls, causal analyses were not undertaken as the study's ability to attribute causal impact was limited due to these factors.

5. Conclusions

The study contributes important early evidence on the potential of CHVs to enhance public sector family planning service delivery in urban Pakistan and provides a basis for future research and programmatic improvements. The study provides preliminary evidence on the effectiveness of CHVs on increasing public sector service provision of contraceptives, particularly for DOH facilities. CHVs bridge the gap between the community and the facility, particularly in areas uncovered by government's existing mobilization staff. Government departments and policymakers should review this evidence and focus on institutionalization of CHVs into respective departments' policy, budget, and workplan to ensure continuation and sustainability.

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