The Research of Medical Science Review
ISSN: 3007-1208 & 3007-1216 Volume 4, Issue 4, 2026

# EVALUATING THE IMPACT OF COMMUNITY-BASED OUTREACH METHODOLOGY USING TRAINED LOCAL WOMEN ON FAMILY PLANNING SERVICE ACCEPTANCE AND CONTRACEPTIVE PREVALENCE IN RURAL SINDH, PAKISTAN: A QUASI-EXPERIMENTAL STUDY

**Parkash Malhi[1], Dr.Sahar Rameez[2], Dr.Kehkashan[3], Noor Muhammad[4], Qamar Shaikh[5], Zulfiqar Ali Sario[*6], Muhammad Mudassir Zafar[7]**

**DOI:** https://doi.org/10.5281/zenodo.19843629

**Keywords**
*Family planning, Community health workers, Contraceptive prevalence, Rural health, Pakistan, NGO outreach, Gender responsiveness.*

**Article History**
*Received: 23 February 2026*
*Accepted: 02 April 2026*
*Published: 28 April 2026*

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**Corresponding Author: ***
**Zulfiqar Ali Sario**

***Abstract***

***Background***

*Evidence on scalable, community-based models to improve reproductive health outcomes in underserved rural settings remains limited. We evaluated the impact of a women-led outreach intervention implemented by HANDS Welfare Organization in rural Sindh, Pakistan, on contraceptive use, family planning (FP) uptake, and women's autonomy.*

***Methods***

*We conducted a quasi-experimental study using secondary data from the DAFPAK baseline (2017–2018) and endline (2024) surveys. The Marvi model trains local women to deliver FP counselling, distribute commodities, and facilitate referrals in communities with restricted access to services. Intervention districts were compared with government-led Lady Health Worker (LHW) areas and matched control sites. Outcomes included contraceptive prevalence, exposure to FP counselling, indicators of women's autonomy, and engagement with ICT-based FP learning. Logistic regression and Difference-in-Differences (DiD) models were used to estimate intervention effects.*

***Findings***

*Contraceptive use increased significantly in intervention areas (18% to 23%; adjusted odds ratio [aOR] 1.45, 95% CI 1.23–1.71), accompanied by improvements in FP awareness and community-level participation. However, gains in women's decision-making autonomy were limited. Uptake of nutrition counselling and engagement with digital FP learning remained low, suggesting persistent structural and sociocultural constraints.*

***Interpretation***

*Women-led community outreach can substantially improve access to and uptake of family planning services in resource-constrained settings. However, improvements in service delivery do not necessarily translate into enhanced autonomy. Future programmes should integrate gender-transformative approaches and strengthen digital health strategies to address entrenched social norms and improve sustainability.*

## INTRODUCTION

Family Planning (FP) is a significant approach to reproductive health, gender equity, but unfulfilled contraceptive demands still exist in most Low-and Middle-Income Countries (LMICs). Community Health Workers (CHWs) have become one of the best-practice models in the global community to expand access to FP and other reproductive and health services, especially in hard-to-reach and rural communities (1;2). Across Sub-Saharan Africa, South Asia, and Latin America, there is strong evidence that CHWs are associated with improved contraceptive uptake, addressing informational constraints, and building social trust in health systems (3;4).

Pakistan's Lady Health Worker (LHW) program, one of the world's largest CHW programs, has demonstrated large-scale impact on maternal and child health and contraceptive use since the 1990s (5;6). While LHWs have a broad geographic reach, FP services remain severely unmet in rural and remote areas due to socio-cultural resistance, gendered decision-making, and distance or logistical constraints (7). In this context, several nongovernmental and community-based outreach models have been piloted as low-cost and flexible alternatives to scale up FP access, but still few have been subject to evaluation.

Community engagement is increasingly seen as a prerequisite for developing sustainable FP programs. Empirical research has shown that locally recruited women can address trust deficits, minimize cultural barriers, and facilitate community acceptability of outreach programs (8;9). Integrated approaches to FP service delivery, which bundle FP with health and livelihood interventions (nutrition and income generation) or leverage Information and Communication Technology (ICT) platforms for behavior change counseling, have also been found to engender local ownership and higher program utilization (10;11). However, systematic evidence on the relative performance of these and similar models in relation to government-led programs is lacking. This study seeks to fill that gap by evaluating a Community-Based Outreach Program (CBOP) implemented by women in rural Sindh, Pakistan. This study leverages quasi-experimental data from a large-scale evaluation of the DAFPAK project (2017–2024) to compare uptake of FP services and Contraceptive Prevalence Rates (CPR) in Marvi-supported districts with control and LHW-served areas. Placing the Marvi model in the broader context of CHW and FP program literature, this paper contributes new evidence on the performance and limitations of a community-driven outreach approach in an LMIC setting.

## METHODOLOGY

This paper draws on a quasi-experimental design that uses the secondary analysis of two extensive, population-based surveys carried out under the Delivering Accelerated Family Planning in Pakistan (DAFPAK) programme. The main objective was to understand how well the Marvi community-outreach model—run by the HANDS Welfare Organization—supports women's use of modern contraceptives, their acceptance of FP services, and their autonomy in rural areas of Sindh. The Marvi initiative is a locally embedded, women-led approach in which trained volunteers from within the community provide counselling, distribute FP commodities, and guide women toward appropriate reproductive health services. To evaluate its effectiveness, outcomes from Marvi catchment areas were compared with those from districts covered by the government's LHW programme and with control areas where no structured FP outreach was in place.

Two sets of survey data were used to conduct the analysis, including the baseline carried out in 2017-2018 and the endline data in 2024. The two surveys employed a multistage cluster sampling technique, which was necessary in an effort to ensure that the target population of married

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women aged between 15 and 49 years were well represented in selected districts. The questionnaires were based on the internationally recommended FP measures, such as the Demographic and Health Survey (DHS) modules. As part of this paper, only women who fulfilled the inclusion criteria, like they were married, of reproductive age and living within one of the intervention, LHW or control clusters were retained. The women who were not living in the household, temporary visitors and those who had incomplete responses to key FP indicators were excluded from the analytic sample.

The two datasets were also harmonized before any analysis was carried out. These involved matching variables, reconciliation of coding schemes and consistency checks in order to make sure that the two rounds were comparable. The important variables were the use of modern contraception now, use of FP in any of the cases, desire to have children, exposure to FP counselling and various variables of autonomy based on mobility, health decision, and family finances. Sociodemographic variables, which have been known to affect contraceptive behaviour based on age, education, parity, household wealth, and exposure to media, were standardised in both datasets. In the case of information existing, the indicators associated with digital/mobile-based FP learning were also included.

Analysis of data was done using descriptive and inferential techniques. First, the descriptive statistics were employed to summarize the characteristics of the participants and investigate the differences between Marvi, LHW, and control areas. The inferential analysis went in two steps. The relationship between exposure to the programme and the use of modern contraceptives whilst controlling the impact of the demographic and socioeconomic characteristics was initially analyzed using multivariable logistic regression. This was then preceded by a DiD study to approximate the difference in FP outcomes between the baseline and endline that could possibly be linked to the Marvi programme. The DiD method was useful in isolating programme effects from wider time-related changes. One of the essential conditions of DiD validity, parallel trends, was tested by reference to baseline trends and graphical tests. Further sensitivity analyses were conducted to assess whether the results showed consistency with alternative model specifications and across particular subgroups, such as younger women, the group of 15-24 years. The entire statistical analysis was done in Stata (version 17 and 18). No direct interaction with human participants was involved in the study because de-identified secondary data were used as the only source of data. The original surveys had been ethically cleared in the institutional review procedures of the DAFPAK programme, and the current analysis did not need additional approval. The data processing and storage were in line with institutional provisions regarding confidentiality and proper use of data. This methodological design provided a strong base on which the effects of the Marvi outreach model can be evaluated as compared to government FP services and non-intervention environments. The quasi-experimental approach, the massive population-based data, and the DiD measurement constituted believable results on the effects of the programme on contraceptive use and the overall issue of women's empowerment in rural Sindh.

## RESULTS

The intervention districts (Sanghar, Dadu, Ghotki, Umerkot) achieved statistically significant improvement in CPR, with a change in prevalence rate of contraceptives being 18 to 23, with Chi-square=8.56 and p=0.003. The control districts consisting of Tando Muhammad Khan and LHW

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areas demonstrated a greater increase in prevalence rates from 27% to 38% (Chi-square=12.74, p<0.001). Based on logistic regression analysis results, the Marvi intervention displayed a statistically significant link to increased CPR (Odds Ratio=1.45, 95% CI: 1.23–1.71, p<0.05). Statistically significant research showed that nutritional service utilization in Marvi-served districts stood at 10% while control districts had higher utilization at 18% (Chi-square=10.12, p=0.001). Intervention districts exhibited a lower rate of women's autonomy in family planning decisions at 48% compared to 60% in control districts with significant statistical evidence (Chi-square=9.25, p=0.002) (See Table 1, Table 2 and Table 3).

**Demographics and Baseline Findings**

The mean age of Married Women of Reproductive Age (MWRA) stood at 31 years, but Marvis demonstrated a higher mean age of 36 years. The education level of MWRA in intervention regions remained low since most attended only primary school, while Marvis exhibited even lower educational attainment, with many lacking any formal education. MWRA households generally earned less than Rs. 15,000 per month. The control areas had 55% of MWRA belonging to wealthier quintiles compared to only 20% in the intervention regions.

**Family Planning Use and Access**

The utilization of family planning methods led to a statistically significant increase in CPR from 18% to 23% in intervention areas (p<0.05) but showed a more substantial rise from 27% to 38% in control areas (OR=1.45; 95% CI=1.23-1.71; p<0.05). People most often used injections, condoms, tablets and female sterilization as their preferred contraceptive methods. A significant portion of individuals did not use family planning services because they wanted to have more children rather than because they opposed contraception. The lower CPR in Marvi areas compared to LHW-served regions can be explained by inadequate quality FP services in remote communities (Figure 1).

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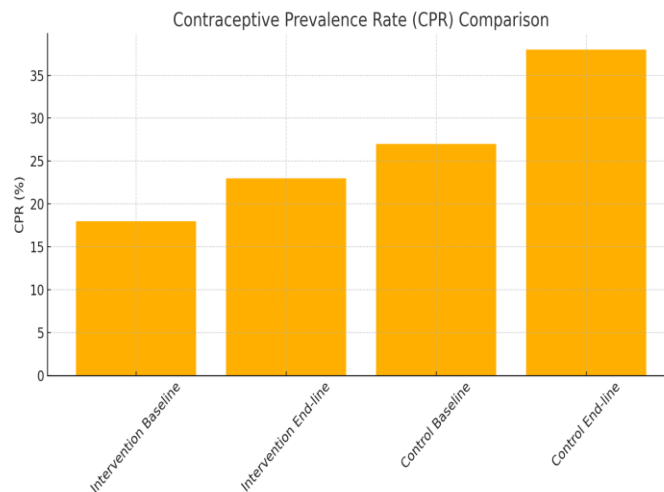


**Figure 1. Contraceptive Prevalence Rate (CPR) Comparison Between Groups**

**Nutrition and Health Results**

According to research findings, local pregnant women showed minimal use of nutritional support programs, with less than 10% taking multivitamin supplements. High breastfeeding rates were accompanied by supplementary feeding practices after six months, which revealed shortcomings in exclusive breastfeeding methods. Marvi-led nutrition counselling reached 43% of households in Badin, but follow-up services failed to meet necessary standards, as shown in Figure 2.

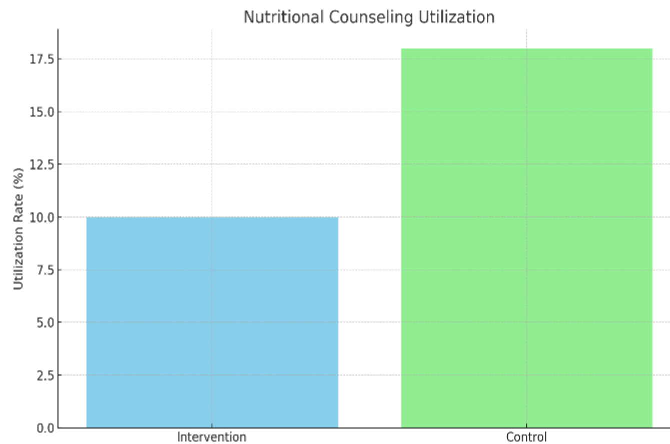


**Figure 2. Nutritional Counseling Utilization - Intervention vs Control**

**Empowerment and Decision-Making**

The promotion of women-focused services by MWRA revealed gender-based power imbalances since women remained largely powerless in making choices about family planning and childbearing. About half of MWRA participated in decision-making, while healthcare providers and in-laws seldom swayed their husbands' choices (Figure 3).

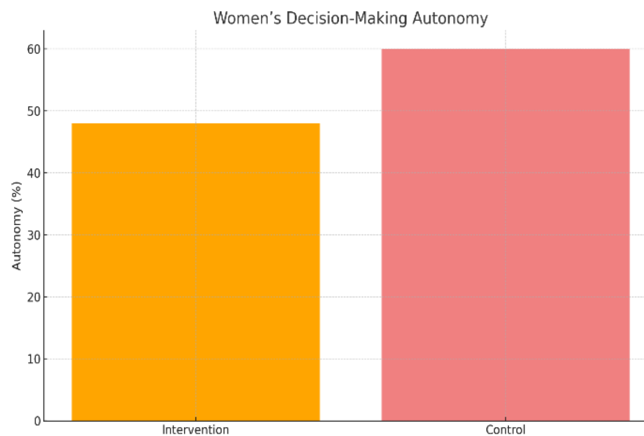


**Figure 3. Women's Decision-Making Autonomy - Intervention vs Control**

**Innovations and Community Engagement**

The "Business in a Box" initiative established local enterprises through Marvis-operated shops to deliver essential products and lower access barriers. The model showed potential, but Marvis was not very supportive of the financial returns

that it was expected to have. The use of ICT-based counseling, as video footage, provided unstable results and must be improved continuously.

Community-based outreach program led by Marvi has the potential to increase the use of family planning services and increase the use of CPR in the rural areas of Pakistan, but should be considered in several ways to ensure the program is effective and sustainable over the long run. It would take long-term efforts to engage communities and enhance the quality of services, and transform cultural practices to establish long-term success. Future research should also estimate the cost-effectiveness of these interventions and their effects by taking into account the evolution of new technology and entrepreneurial frameworks of communities.

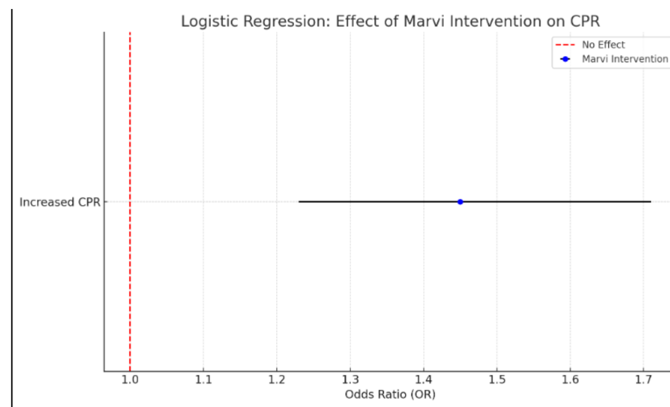


**Figure 4. Logistic Regression**

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**DISCUSSION**

The results of the analysis of the community-based outreach strategies that included engaging Marvi workers (locally trained women) to work in rural Pakistan can provide quite significant information about enhancing the acceptance of family planning services and CPR by using such an intervention. The data provided by the HANDS project during the period of November 2017 to March 2024 illustrates the successful performance of the initiative itself, as well as the challenges it had to face. The analysis presents key findings reviewing, discussing the identified challenges and factors and positive outcomes of the research.

**Facilitators And Successes**

**Community-Based Approach**

The Marvi model was successful due to the community-based model that has increased the availability of family planning services in areas that had been inaccessible and underserved. Marvis members who act as relied-upon community leaders have played an important role in eliminating barriers to healthcare access for MWRA members who face cultural or logistical challenges in their attempt to access health facilities. The services that were provided by Marvis were community-based and incorporated counseling services as well as distribution of contraceptives, along with referrals to enhance the level of family planning method awareness and usage. Availability of family planning services has also increased in Marvi areas, which has contributed to increasing the proportion of MWRA accessing contraception, even though other limitations still exist. CHWs demonstrate strong potential to become key figures in boosting

family planning acceptance among rural and marginalized communities.

### Increased Participation and Community Engagement

The Marvi model experienced benefits due to its strong community engagement. As a result of the intervention, many MWRA report that their role in household decisions has expanded, and Marvis facilitated conversations about family planning and healthcare options. The growing engagement of MWRA suggests they are gaining empowerment and independence despite its current limited extent.

### Training and Capacity Building

Marvis received effective training as one of the program's achievements. Although the training frequency and quality show some deficiencies, many Marvis confirmed they had adequate preparation in basic family planning counselling and nutrition support, together with malnutrition screening. One of the key strengths of this model involves Marvis becoming a reliable and well-informed source within their communities.

### Potential for Business Sustainability

The "Business in a Box" project shows potential to sustain the intervention through the generation of income streams for Marvis. The initiative will help Marvis build financial independence to support regular outreach and service delivery. This initiative requires additional development and support to achieve greater impact, as noted previously.

The intervention aimed to improve CPR rates among marginalized communities, specifically in Sindh's rural districts, including Thatta, Sujawal, and Badin. Family planning use stays low in the Marvi outreach areas with 27-38% ever-use and 18-23% current use. A significant portion of MWRA (35-45%) experience an unmet need for family planning, yet contraceptive adoption remains slow. Women do not use family planning methods because they want more children, and local cultural standards determine preferred family size. The difference between service availability and family planning acceptance demonstrates that personal and cultural views about family size and fertility play a more significant role than just having access to services.

Previous research indicates that persistent difficulties in maintaining high-quality FP services and follow-up care account for the observed differences in CPR between Marvi and LHW regions (6;7). LHW-served areas demonstrate increased CPR, but the factors leading to this difference have not been identified. The absence of effective family planning services in remote Marvi communities and distant villages most likely explains this difference. The effectiveness of Marvi's outreach suffers due to the limited number of trained health personnel and insufficient follow-up care.

### Inadequate Health and Nutrition Support

Studies have established that there has been a major gap in health and nutrition services that are predominantly experienced by pregnant and breastfeeding mothers and those under the age of five years. Badin made the same effort, which only achieved 43% of Badin households with nutrition counseling using Marvis, and the percentages of malnutrition screening were pathetically low at 2 to 12%. The circumstance illustrates poor support services as well as the limited capability of Marvis to provide consistent, organized interventions. The situation is aggravated by the fact that less than 1 out of 10 pregnant women is using the multivitamins, as this indicates not only a lack of information but also an obstacle to accessing nutrition services.

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This program is also missing an essential component as the program fails to offer the standard malnutrition screening and follow-up treatment in the areas where food insecurity and malnutrition a common features. This is indicated by the fact that breastfeeding practices are insufficient even after colostrum feeding and exclusive breastfeeding within the first months, which implies that more education and follow-up care on the practices of infant feeding should be aimed at.

**Decision-Making Power and Gender Norms**

The research has found that gender inequality in household decision-making is a significant barrier. Even though approximately half of the MWRA were involved in the processes of making household decisions, making major decisions concerning the family planning, childbearing, and domestic spending was still the preserve of male relatives or in-laws. The deeply rooted gender conventions do not allow women to make decisions on their own, even though they are instrumental in providing family support. The authority systems of the cultures and the families do not allow the effective application of family planning mechanisms by restricting women from making personal decisions regarding contraceptives.

**Business in a Box and ICT Integration**

"Business in a Box" program can assist Marvis in creating local businesses that supply basic goods, and is one of the possible ways to increase the service provision in less privileged communities. Its efficiency is, however, questionable. The initiative satisfies the access needs of basic goods but fails to provide the long-term sustainability and impact unless it is supplemented with proper business education, financial support, and market inclusion. The use of ICTs such as mobile applications to offer video-based family planning instructions in rural areas is a new practice. The adoption by many Marvis has not been high during the initial implementation phase, as many have not utilized the technology.

**Policy implications**

Investment in FP in underserved regions will probably entail a more complex solution that will expand NGO-based outreach activities by providing large amounts of funds to national and international funders-such as Marvis, to access remote populations and combine them with government CHW programs to make the services more comprehensive and sustainable. In addition, programs should also account for the need for gender-transformative approaches, male engagement, and integrated services around FP, nutrition, and digital health services.

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**Limitations of the Study**

**1. Data Not Collected for this Specific Research Question**

The DAFPAK project was not designed a priori as an academic study, but rather as a program evaluation. As a result, some of the study variables that may have been useful for the analysis of interest were not collected or were captured in a simplified way. For example, the original dataset does not provide a nuanced measure of women's decision-making autonomy or long-term continuation of contraceptive use.

**2. Potential Unmeasured Confounding**

Despite adjusting for key socio-demographic factors that could be potential confounders, there are other important determinants of contraceptive use which were not available in the dataset. For example, husbands' attitudes and practices towards FP, influence from in-laws, as well as community-level gender norms, are likely to affect

MWRA's contraceptive behaviors. Their lack in the dataset may have had an impact on the study findings.

**3. Variation in Program Implementation**

The model of Marvi outreach varied across different districts of Sindh in terms of training, supervision and availability of contraceptive commodities. These unmeasured variations in program implementation could have impacted the results.

**4. Self-Reported Measures**

The key variables of interest, such as contraceptive use or women's role in FP decision-making, were self-reported by the study participants. Some MWRA may have underreported their use of FP methods or participation in FP decision-making, particularly in a conservative rural setting, due to recall bias or social desirability bias.

**5. Comparability of Groups**

Although the baseline comparability of the study groups was established, the intervention and control districts may not be comparable with respect to other contextual factors that were not measured in the study (such as district health infrastructure and cultural practices), and these unobserved confounders may have impacted the study findings.

These important limitations notwithstanding, the secondary data analysis presented in this brief has yielded new and valuable insights by applying a comparative, quasi-experimental approach to evaluate a unique, community-based CHW model. The secondary analysis also situates findings from the project in the broader CHW and family planning literature to advance an academic understanding of innovative community-based family planning programming.

Overall, the findings suggest that the Marvi outreach model increased contraceptive prevalence and awareness of FP services among hard-to-reach groups in underserved districts, but the impact was relatively modest and constrained by socio-cultural barriers, weaker service integration, and lack of women's autonomy. The LHW-served areas, on the other hand, recorded higher levels of contraceptive prevalence and decision-making, reflecting the comparative benefits of a government-backed CHW model. However, the Marvi program appears to be an important outreach strategy for reaching underserved communities not covered by formal CHW programs.

Scaling up FP efforts in hard-to-reach and rural areas in Pakistan will necessitate a purposeful policy and programmatic shift toward hybrid CHW strategies, gender-transformative approaches and the integration of FP into other health and livelihood services to be able to meet national and global FP targets in rural and marginalized communities.

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## Conclusion

The findings of this study show that the Marvi outreach model has helped improve contraceptive use and awareness of family planning services among women living in some of the most underserved and hard-to-reach parts of rural Sindh. These gains are significant, but the net effect was still small. Still, many women experience the challenges of entrenched social expectations, lack of control in decision making and lapses in service connections- all of which clearly influence the ways and times within which they can pursue their reproductive desires. These obstacles are useful in the explanation of why the progress, though realized, did not go as far as it could have. This was done by comparison with districts that were under the LHW programme that had more

contraceptive uptake and positive signs that women had a say in household decisions. This is probably a measure of the benefits of an established and government-funded system which has a greater reach, more resources and is more formalized within the community. Nevertheless, the LHW programme is not available to every rural and remote community- creating gaps for women who lack access to FP information and services on a regular basis.

To sum it up, the Marvi project is a significant complementary factor. The fact that it can access households to which formal programmes frequently fail to reach, and its community-based nature, make it particularly useful to reach marginalized groups. Enhancing the model by further integration with the public-sector systems, more counselling strategies, national and international funding and activities to empower women's autonomy may also make their contribution even more significant. Together, the Marvi and LHW programmes offer a pathway toward more inclusive, equitable family planning coverage in rural Sindh.

**Acknowledgements**

The HANDS project team, alongside district managers and partners, Marvis and MWRA, received immense appreciation for their essential input and efforts in the community and supported this study to showcase the potential of Mravi-ngo-led interventions for improved community health outcomes.

**AI Declaration**

This document uses generative AI to assist in language, formatting, and flow. The use of the AI is monitored by the lead author. It is being used only to enhance clarity and readability.

**Table 1: Comparison of Contraceptive Prevalence Rate (CPR) Between Intervention and Control Areas**

| Group | Baseline CPR (%) | End-line CPR (%) | p-value |
|---|---|---|---|
| Intervention Areas | 18% | 23% | 0.003 |
| Control Areas | 27% | 38% | <0.001 |

**Table 2: Logistic Regression Analysis - Impact of Marvi Intervention on CPR**

| Variable | Odds Ratio (95% CI) | p-value |
|---|---|---|
| Marvi Intervention | 1.45 (1.23–1.71) | <0.05 |

**Table 3: Nutritional Counseling and Women's Decision-Making Autonomy**

| Indicator | Intervention (%) | Control (%) | p-value |
|---|---|---|---|
| | | | |
| Nutritional Counseling Utilization | 10% | 18% | 0.001 |
| Women's Decision-Making Autonomy | 48% | 60% | 0.002 |

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