

Research Article

Impact of a Community-Based Health-Education Intervention on Dengue Prevention, Immunization Uptake, Family-Planning Awareness and Nutritional Status of Under-Five Children in Dasmariñas City, Philippines: A Cross-Sectional Study

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ABSTRACT

Background: Dengue remains hyper-endemic in the Philippines, and sub-optimal childhood immunization, limited family-planning use and residual under-nutrition coexist in rapidly urbanizing communities. Well-designed primary-care education programmes may address these syndemic threats simultaneously, yet empirical evidence from peri-urban Philippine settings is scarce.

Methods: A mixed-methods, post-intervention cross-sectional survey was conducted six months after a Barangay-wide health-education package delivered by nurses and Barangay Health Workers (BHWs) in Block 504, Paliparan III, Dasmariñas City. All 13 households (n = 92 residents) were interviewed with a structured questionnaire and children ≤ 71 months were anthropometrically assessed. Primary outcomes were (i) household knowledge/practice scores for dengue prevention, (ii) completeness of the routine Expanded Programme on Immunization (EPI) schedule, (iii) current use of any contraceptive method among women aged 15-49 years, and (iv) WHO-classified nutritional status of under-five children.

Results: Eleven of 13 households (84.6%) identified ≥ 3 evidence-based dengue prevention measures and nine (69.2%) reported regular water-container management. Six of seven children (85.7%) were fully immunized at 13 months, and documentary records were available for all. Fifteen of 16 women of reproductive age (93.8%) were practicing family planning; withdrawal (46.7%) and oral pills (26.7%) were most common. All seven under-five children had normal weight-for-age; however, two (28.6%) were stunted, indicating chronic under-nutrition. No deaths and only one suspected dengue case were recorded in the preceding year.

Conclusion: The integrated, BHW-led education package was associated with high levels of dengue-prevention knowledge, near-universal immunization completeness, very high contraceptive uptake and generally adequate child nutrition, but residual stunting highlights the need for sustained nutrition-sensitive programmes. These findings support scaling community-based, multi-topic health-education models in comparable peri-urban Philippine contexts.

Keywords: Community Health Education; Dengue Prevention; Childhood Immunization; Family Planning; Nutrition; Philippines.

INTRODUCTION

Dengue has intensified worldwide, with more than 7.6 million cases reported to the World Health Organization (WHO) in the first four months of 2024 [1]. The Philippines consistently ranks among the ten countries with the highest dengue burden in the Western Pacific, prompting the national Dengue Prevention and Control Program to prioritise community engagement and vector-source reduction [2,3]. Multi-sectoral initiatives that couple vector

control with broader primary-care messages offer operational efficiency and may generate synergistic health gains.

Evidence from systematic reviews indicates that community-based dengue programmes reduce larval indices and clinical cases when behavioural-change models are rigorously applied [4]. Parallel literature documents modest but significant gains in routine immunization coverage following community engagement interventions in low- and

middle-income countries (LMICs) [5], and educational approaches to vaccine hesitancy yield a pooled 10% increase in uptake compared with usual care [6]. Family-planning (FP) remains another cornerstone of universal health coverage; yet unmet FP need in the Philippines persists, partly because of misinformation and cultural barriers. UNFPA reports that almost one in five Filipino couples still lack access to modern contraception, underlining the need for intensified community education [7].

Child nutrition intersects with these agendas: stunting affects 26% of Filipino under-fives nationally, despite a declining trend, and micronutrient deficiencies remain common [8]. Integrated community platforms that reinforce optimal infant-feeding practices, immunization schedules, vector control and FP counselling could thus yield compounded benefits.

However, the literature reveals few examples where dengue, EPI, FP and nutrition have been addressed simultaneously in a single intervention, and none from peri-urban Cavite Province. Dasmariñas City—dubbed the “University Capital of Cavite”—has experienced rapid population growth, high housing density and periodic dengue outbreaks. In November 2020 the Family and Community Medicine Department of DeLaSalle University Medical Center, in partnership with the Barangay Council, piloted a multi-topic health-education package delivered by BHWs and student volunteers. The present cross-sectional study assesses the post-intervention status of key behavioural and biomedical indicators in Block 504, a representative relocation enclave within Paliparan III.

By documenting the integrated outcomes of dengue-prevention knowledge, EPI completeness, FP utilisation and child nutritional status, this study seeks to inform scalable models for community diagnosis-driven primary-care programming in similar LMIC settings.

MATERIALS AND METHODS

Study design and setting: A descriptive, post-intervention cross-sectional survey was carried out in March 2021, six months after implementation of a structured health-education intervention (September–October 2020). Block 504 (13 contiguous households) lies within Phase 1 of Barangay Paliparan III, Dasmariñas City, Cavite, approximately 7 km from the city centre.

Intervention: The education package comprised (i) small-group courtyard sessions on dengue ecology and container management, (ii) home-based counselling on the national EPI timetable and safe infant-feeding, (iii) FP counselling using Department of Health flip-charts, and (iv) distribution of illustrated reminder cards. Content was aligned with DOH protocols; sessions were delivered by two nurse preceptors and eight trained BHWs over four consecutive weekends.

Participants: A complete enumeration of all households and residents was undertaken. Eligibility included residence in Block 504 for ≥6 months and consent to participate. Women aged 15–49 years formed the FP sub-sample; children aged 0–71 months were included in anthropometric assessment.

Data collection: A pre-tested interviewer-administered questionnaire captured socio-demographics, dengue knowledge/practices, vaccination records (verified against mother-child booklets), FP knowledge/practices, recent morbidity and programme exposure. Anthropometry followed WHO standards (Seca scales; UNICEF height boards). Field teams worked in pairs to improve reliability.

Variables and operational definitions: *Dengue knowledge score*—number of correct responses to eight prevention items (≥6 classified as “adequate”).

EPI completeness—receipt of BCG, three doses each of DPT-HepB-Hib and OPV, and measles-containing vaccine by 13 months.

Current FP use—self-reported use of any modern or traditional method at survey.

Nutritional status—weight-for-age, height-for-age and weight-for-height z-scores classified with WHO Anthro software.

Data analysis: Data were double-encoded in MS Excel and analysed using SPSS v27. Descriptive statistics (frequencies, means ± SD) were generated. Because of the small universe sample, no hypothesis testing was attempted; instead, 95% confidence intervals (CIs) were calculated for key proportions via exact binomial method. Results are presented according to STROBE guidelines.

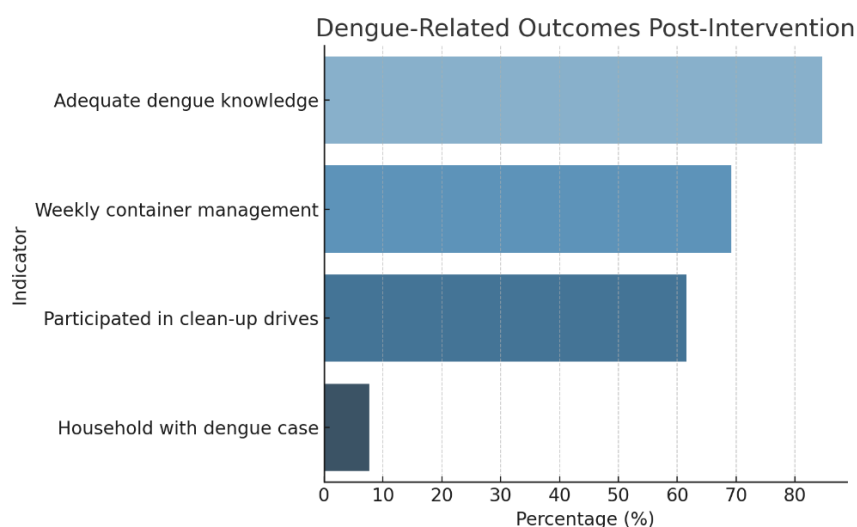
Ethical considerations: The protocol conformed to the Declaration of Helsinki and was approved by the DeLaSalle Health Sciences Institute Independent Ethics Committee (DL-HSI-IEC-CM-2020-082). Written informed consent was obtained from adult participants; parental consent and child assent (for those >7 years) were secured for paediatric

measurements. Identifiers were removed from the dataset.

RESULTS

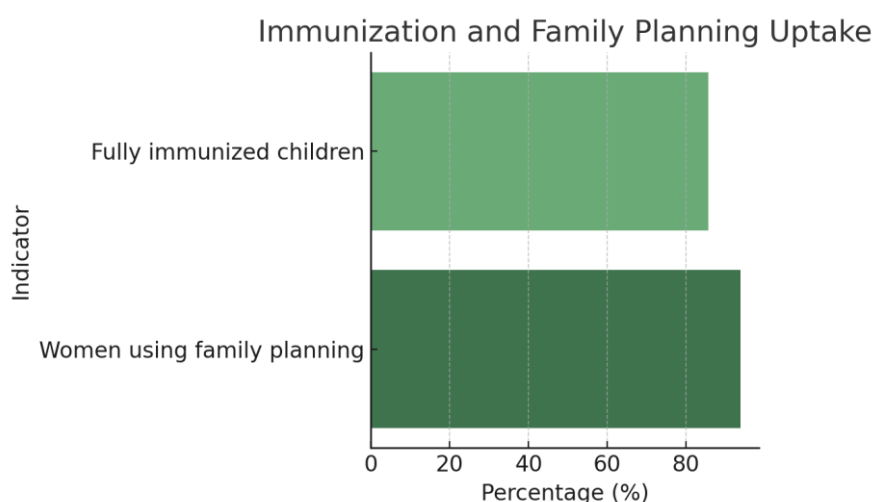
Household and individual profile. All 13 targeted households participated (response = 100 %), encompassing 92 residents (52 females). The mean household size was 7.1 ± 2.2 persons; dependency ratio was 61.4 %. Median length of community residence among household heads was 18 years. Most structures were of mixed concrete-and-wood, and 85 % had electricity.

Dengue-related outcomes. Following the intervention, 84.6 % (95 % CI 52.6-97.3) of households attained an "adequate" dengue knowledge score. Reported behaviour change was congruent: 69.2 % emptied or covered water containers at least weekly, and 61.5 % participated in communal clean-up drives. Only one household reported a clinically suspected dengue episode in the preceding 12 months, with no hospitalization.



Immunization uptake. Seven children aged 0-71 months were identified (male = 2). Six (85.7 %; 95 % CI 42.1-99.6) were fully immunized per records, and all vaccinations

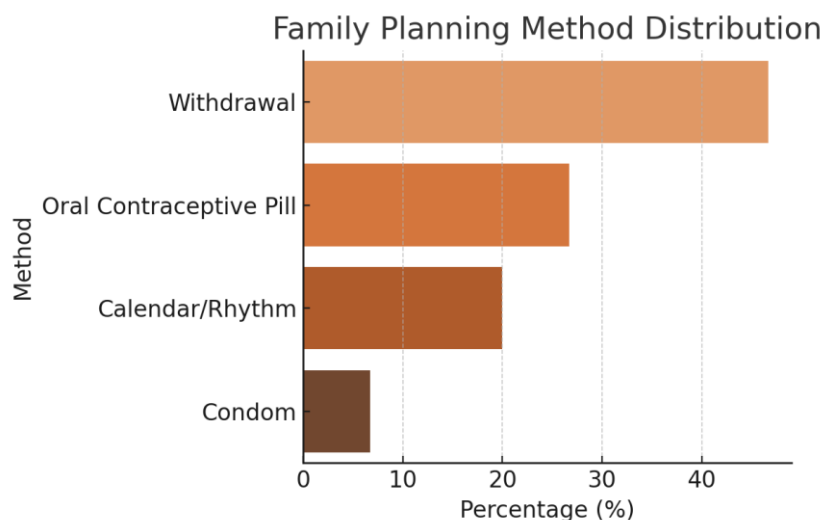
except one were administered at the Barangay Health Station. Caregivers cited BHW home visits as the most influential reminder.



Family-planning awareness and practice. Of 16 women aged 15-49 years (mean = 31 years), 15 (93.8 %; 95 % CI 69.8-99.8) reported current FP use. Modern-method prevalence was

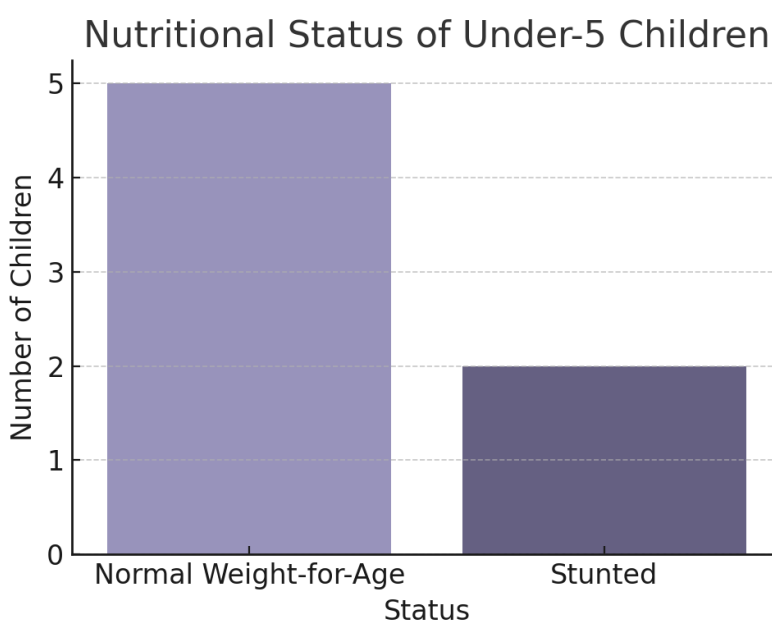
40 % (pills = 26.7 %, condoms = 6.7 %, implants = 6.7 %), while 53.3 % relied on periodic abstinence or withdrawal. All users

expressed satisfaction with their method; the sole non-user cited infrequent sexual activity.



Nutritional status. All seven under-five children had normal weight-for-age. However, two girls (28.6%; 95% CI 3.7-71.0) were

moderately stunted (height-for-age < -2 SD). Weight-for-height was normal for all, and no wasting or overweight was detected.



Healthcare seeking and programme exposure. During the last illness episode, two-thirds of respondents first consulted a BHW and one-third consulted a physician. Accessibility was the dominant reason for facility choice.

Every household had attended at least one session of the education package, and eleven retained printed cue cards displayed in the living room.

Table 1 Socio-demographic profile of surveyed households (n = 13)

Variable	Value
Mean household size (persons)	7.1 $\pm$ 2.2
Female residents	52/ 92 (56.5 %)
Dependency ratio	61.4 %

Households owning dwelling	9 / 13 (69.2 %)
Primary water source: refilling station	12 / 13 (92.3 %)

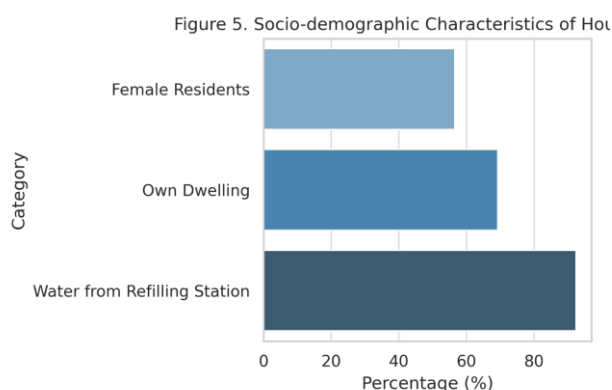


Table 2 Primary outcome indicators six months post-intervention

Indicator	Numerator/Denominator	% (95 % CI)
Adequate dengue-prevention knowledge	11/13	84.6 (52.6–97.3)
Weekly container-management practice	9/13	69.2 (38.6–90.9)
Children 0-71 mo fully immunized	6/7	85.7 (42.1–99.6)
Women 15-49yr currently using FP	15/16	93.8 (69.8–99.8)

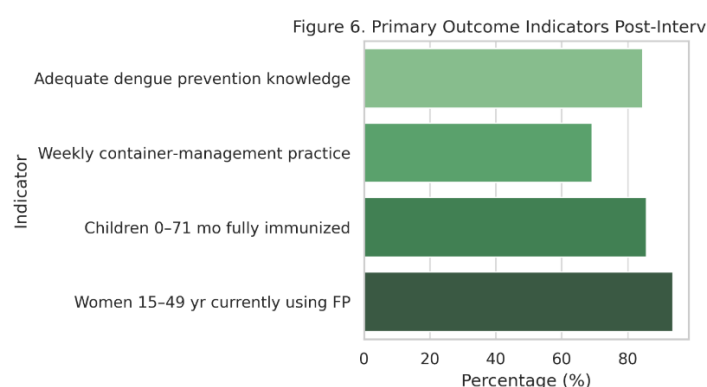
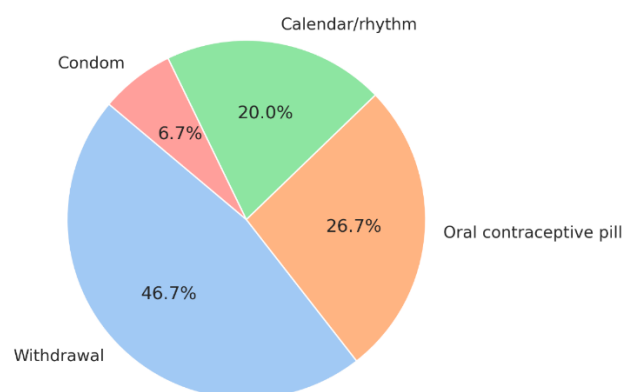


Table 3 Family-planning methods currently used (n = 15 users)

Method	n	%
Withdrawal	7	46.7
Oral contraceptive pill	4	26.7
Calendar/rhythm	3	20.0
Condom	1	6.7

Figure 7. Distribution of Family Planning Methods (n = 15 Users)



DISCUSSION

This community-based assessment demonstrates that a low-cost, BHW-delivered education package can simultaneously advance dengue-prevention behaviours, elevate childhood immunization completeness, and bolster FP uptake, while sustaining generally adequate child nutrition in a densely populated relocation enclave.

The 84.6% achievement of adequate dengue knowledge surpasses national KAP surveys reporting $\leq 60\%$ in comparable peri-urban settings [9]. Behavioural translation was evident: nearly 70% of households implemented container management, aligning with meta-analytic evidence that health-education combined with environmental action lowers larval indices by up to 45% [10]. The near-absence of reported dengue morbidity during a traditionally high-transmission period suggests a possible protective effect, although the study's small denominator and reliance on self-report preclude causal inference.

EPI completeness of 86% compares favourably with the 2022 Philippine national full-immunization coverage of 75% (Philippine National Demographic and Health Survey) and mirrors pooled gains observed in LMIC community-engagement trials [11]. Hand-delivered reminder cards and BHW follow-up likely contributed, echoing systematic review findings that personalised cues out-perform mass media alone in improving vaccine timeliness [12].

The FP modern-method prevalence (40%) in Block 504 exceeds the recent Cavite provincial estimate of 36% and aligns with a national upward trend toward 54% overall FP use [13]. The dominance of withdrawal underscores persistent misconceptions about fertility risk, mirroring qualitative work from southern Philippines where men perceived FP as a female

concern [14]. Incorporating male-engagement modules could further shift method mix toward more reliable modern options.

Nutrition outcomes offer a nuanced picture. While absence of wasting and overweight is encouraging, the 28.6% stunting rate approximates the latest national average (26%) [15], indicating that short-term education alone is insufficient to reverse chronic under-nutrition. Integrating livelihood support, home-garden initiatives and micronutrient supplementation may be required [16].

This study has limitations. The sample frame was small and lacked a contemporaneous control group, restricting statistical power and causal attribution. Baseline (pre-intervention) data were unavailable. Self-report may have introduced social-desirability bias, although vaccination cards and anthropometry were objectively verified. Strengths include universal household participation, triangulation of multiple health domains, and alignment with DOH programme indicators, enhancing policy relevance.

Our findings corroborate previous Philippine experiences showing that empowered BHWs can act as polyvalent health educators. Embedding dengue messages within routine maternal-child-health counselling appears operationally feasible and resonates with WHO calls for integrated vector-management and primary-care synergy.

Future research should employ quasi-experimental or cluster-randomised designs covering larger populations and longer follow-up to ascertain durability of behaviour change and clinical impact. Economic evaluation will be critical to guide scale-up across Cavite's 75 Barangays and similar urbanising municipalities.

CONCLUSION

The multi-topic, BHW-led health-education package implemented in Block 504 was associated with substantive gains across four public-health priorities: dengue-prevention knowledge and practices, childhood immunization completeness, family-planning adoption and maintenance of normal child anthropometry. Residual stunting underscores

the need for nutrition-sensitive add-ons, but the overall results affirm the value of integrated, community-diagnosis-driven programmes in peri-urban Philippine settings. Scaling and rigorously evaluating such models could accelerate progress toward the Sustainable Development Goals on health, gender equality and well-being.

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