



Original research article

# Client and provider experiences with self-administration of subcutaneous depot medroxyprogesterone acetate (DMPA-SC) in Malawi<sup>☆</sup>



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## ARTICLE INFO

### Article history:

Received 18 December 2017

Received in revised form 20 February 2018

Accepted 21 February 2018

### Keywords:

Self-injection

Self-administer

Subcutaneous depot medroxyprogesterone acetate

Malawi

Community health worker

Family planning

## ABSTRACT

**Objective:** As low- and middle-income countries (LMICs) consider adding self-administration of subcutaneous depot medroxyprogesterone acetate (DMPA-SC) to their contraceptive method mix, learning about family planning clients' and providers' experiences with self-injectable DMPA-SC during trials will inform introduction and scale-up efforts.

**Study design:** We conducted semistructured interviews with 30 randomly selected adult women enrolled in the self-administration group of a 12-month randomized controlled trial studying DMPA-SC continuation rates in rural Malawi. We asked about their experiences learning to self-inject, self-injecting, remembering when to re-inject, and storing and disposing of DMPA-SC. We also interviewed 12 providers – clinic-based providers (CBPs) and community-based health surveillance assistants (HSAs) – who trained clients to self-inject DMPA-SC during the trial. We asked about their experiences training and supporting women to self-inject DMPA-SC during the trial and their recommendations for scale-up of self-administered DMPA-SC.

**Results:** Clients and providers reported positive experiences with DMPA-SC self-injection. Clients felt that DMPA-SC self-injection saved them time and money, and providers felt that it reduced their workload and saved them time. We found that both CBPs and HSAs successfully trained clients to self-inject DMPA-SC and that clients safely and appropriately stored and disposed of DMPA-SC.

**Conclusions:** Our findings contribute to the growing body of evidence of the feasibility of DMPA-SC self-injection in LMIC settings. We recommend that providers plan to train clients for at least 30 min, emphasize the activating and injecting steps during training, use up to four practice injections per client trained and give self-injectors calendars to help them remember when to reinject.

**Implications:** DMPA-SC self-administration should be made available in LMIC settings, but because it is a new practice, implementation guidance is needed. We offer practical recommendations for introducing and scaling up DMPA-SC self-administration based on clients' and providers' experiences during a trial investigating this practice in Malawi.

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## 1. Introduction

Use of modern contraceptive methods has been increasing in Malawi and other sub-Saharan African countries. Contraceptive injectables have been the largest contributor to this increase, but many women who start injectables discontinue within the first year of use. In 2015–16, nearly half of Malawian women using short-term modern methods used injectables, but 41% of those who started injectables discontinued

use within 12 months [1,2]. Furthermore, while 30% of currently married women used injectable contraceptives, 19% had unmet need for family planning [1]. Given the popularity, safety and effectiveness of injectables, many countries are considering adding a newer injectable option, subcutaneous depot medroxyprogesterone acetate (DMPA-SC), to their contraceptive method mix to achieve their family planning goals. Through its unique design, DMPA-SC can be safely delivered by lower-level healthcare providers, including community health workers, and even self-administered by women themselves; thus, it may increase access to injectables and method continuation, and ultimately address unmet need for family planning.

Self-administration of DMPA-SC has been shown to be safe, acceptable and feasible in low- and middle-income country (LMIC) settings [3–7]. Moreover, we recently conducted an open-label randomized

<sup>☆</sup> Declarations of interest: None.

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controlled trial in rural Malawi that found significantly higher DMPA-SC continuation rates among women in the self-administration group compared to women who received provider-administered DMPA-SC [8]. As countries contemplate allowing women to self-inject DMPA-SC, practical information is needed to inform programmatic efforts.

Since self-administration of DMPA-SC is a new practice and little is known about women's and providers' experiences with this method, the trial included a qualitative component to learn about the experiences of a subset of self-injectors as well as a subset of family planning providers who trained women to self-inject DMPA-SC during the trial. The results from the qualitative component presented here offer important practical recommendations to inform self-injection training materials, messages for providers and clients, and future introduction and scale-up efforts in Malawi and elsewhere in sub-Saharan Africa.

## 2. Material and methods

### 2.1. Ethics statement

The protocol was reviewed and approved by the Protection of Human Subjects Committee at FHI 360, Durham, NC, USA, as well as the College of Medicine Research and Ethics Committee, University of Malawi. All study staff completed training on research ethics, the protocol and informed consent administration. All trial participants provided their informed consent to participate, and a separate informed consent process was conducted with participants of the qualitative component of the study. The trial was registered with [ClinicalTrials.gov](https://www.clinicaltrials.gov/ct2/show/study/NCT02293694) (NCT02293694).

### 2.2. Trial description

The trial was conducted from September 2015 to February 2017 in six Ministry of Health clinics in rural Mangochi District, Malawi, offering family planning services and having established community-based distribution programs in which health surveillance assistants (HSAs) provide DMPA-IM. During the trial, clinic-based providers (CBPs) and HSAs randomized 731 women ages 18 to 40 seeking family planning services to receive DMPA-SC (Sayana® Press 104 mg/0.65 mL suspension for injection) administered by a provider, or to be trained to self-inject DMPA-SC.

Self-injectors who could successfully self-inject under the supervision of providers at enrollment were sent home with three doses, written instructions describing the steps for self-injection and a calendar with their reinjection dates circled. The provider-administered group received DMPA-SC and a calendar with their reinjection dates circled and were asked to return to the provider for subsequent injections. Additional details of the trial can be found elsewhere [8]. Here, we report the results of the qualitative component of the trial.

### 2.3. Sample selection

Using the full list of family planning providers who completed the study training, a randomization manager randomly selected 12 providers stratified by provider type (6 CBPs and 6 HSAs) for the qualitative component of the study. The randomization manager also selected 30 participants from the full list of participants who had been randomized to the self-injection group. Using the same procedures, six alternates for each participant type were chosen as replacements in case the initially selected participants could not participate.

Sample sizes for the qualitative interviews (30 self-injectors and 12 study providers) were based on purposive, nonprobabilistic sampling, which relies on the concept of saturation, or the point at which no new information or themes are observed in the data. Research has shown that saturation can occur within the first 12 interviews conducted in a relatively homogeneous group when the objective of the research is to understand common perceptions and experiences [9].

### 2.4. Data collection

Trained data collectors conducted semistructured interviews using pretested guides with the selected participants from April 2016 to February 2017. Clients were interviewed after they discontinued using DMPA-SC during the main trial. Women were considered discontinued if they reported that they did not receive another injection within the allowable window per the Sayana Press label (i.e., within 12 and 14 weeks of the last injection) or when they reached the end of the trial (12 months after enrollment). Providers were interviewed throughout the trial and after enrollment ended, depending on their availability. Interviews were conducted in a language understood by the participant (Chichewa, Chiyao or English) and audio recorded with participants' permission. Participants were compensated approximately US \$5.00 for the interview. The interview guide for clients asked about their experiences during the trial of learning to self-inject, self-injecting, their strategies for remembering when to reinject, and storing and disposing of DMPA-SC. The interview guide for providers asked them to describe their experiences training and supporting women to self-inject DMPA-SC during the trial and their recommendations for scale-up of self-administered DMPA-SC in their communities.

### 2.5. Data analysis

All but two clients agreed to have their interviews recorded. The interviews were transcribed verbatim and translated from local languages to English. The data collector took detailed notes during the two interviews that were not recorded and then translated the notes into English for analysis.

The transcript data were coded using NVivo 11 qualitative software. Two analysts conducted a thematic analysis using a codebook based on the interview guide, as well as an inductive, data-driven approach whereby emergent codes were applied to the raw data. Inter-coder agreement was assessed on 17% of the transcripts until high consistency was achieved. Data summary reports were generated separately for each study population (i.e., self-injectors and providers) to identify key themes and were used in conjunction with interpretive textual analysis to understand both the depth and breadth of themes. We initially analyzed the provider data by provider type (CBPs or HSAs) and found many similarities. Similarly, we initially analyzed the self-injector data by whether clients were enrolled by CBPs or HSAs and found many similarities. Therefore, we combined provider type when presenting the results.

## 3. Results

We interviewed a total of 30 self-injecting clients who participated in the trial. Twenty-eight of the clients were from the original, randomly selected list. One replacement was made due to a study staff error, and one client refused to participate and was replaced. All 12 providers originally selected were interviewed.

### 3.1. Participant characteristics

The average age of clients we interviewed was 28 years; all clients had children, and most were married (Table 1). Most clients had previous experience using DMPA-IM (Table 1), and none had ever given themselves or another person an injection (data not shown).

The average age of the providers we interviewed was 40 years, and most were female (Table 2). CBPs were mainly nurse/midwives (data not shown). Providers had a wide range of experience providing family planning, and most had prior subcutaneous injection experience. Only two CBPs had prior experience training patients to self-inject (insulin).

**Table 1**  
Client characteristics

|                                      | Number of clients    |
|--------------------------------------|----------------------|
| Total                                | 30                   |
| Continuation status in main trial    |                      |
| Through 12 months (continued)        | 29                   |
| Early discontinuation at 3 months    | 1                    |
| Type of provider who enrolled client |                      |
| Clinic-based                         | 9                    |
| HSA                                  | 21                   |
| Average age in years (range)         | 28 (19–42)           |
| Currently married                    | 24                   |
| Has children                         | 30                   |
| Average number of children (range)   | 3 (1–6) <sup>a</sup> |
| Used DMPA-IM prior to study          | 24                   |

<sup>a</sup> One client was not asked this question.

### 3.2. Experience during study enrollment and self-injection training

Most clients reported being happy to be randomized into the self-injection group, mainly because they felt that self-injecting DMPA-SC was convenient and saved them time compared to traveling to the clinic or to a HSA for DMPA-IM. For example, a client said:

I was very happy, because I traveled a long distance from home to health center to seek injection, so it was my wish that if I choose the home and self-injection group, I will take my injection at home and stay away for a year.

Some clients described initially feeling apprehensive about self-injecting, mainly because they were nervous or felt self-doubt about their ability to self-inject; however, all who were interviewed ultimately successfully self-injected. One client explained:

I was shivering ... If I fear to be injected by someone, can I manage to inject myself? ... After I was introduced to the new one [DMPA-SC], I found that the job is already done. The unit is stored together with the drug, it is self-contained. It wasn't difficult.

All providers reported positive experiences and felt that most women could successfully learn to self-inject. When asked about who would make an ideal candidate for self-injection, one HSA said:

In terms of education, I think that's not really a problem because where I am here, a lot of people are primary school dropouts. They can't even write, but they are the ones you will find to be self-injectors and are managing to inject themselves.

The main difficulties providers cited regarding training were clients' initial fear of self-injecting and self-injecting procedures (activating, inserting needle, releasing and holding DMPA-SC). However, providers said that all clients overcame the difficulties when providers

repeated specific training messages and demonstrated how to inject. One CBP described:

Most of my clients were overwhelmed if they had picked an envelope that directed them to the self-administering group. They were saying that they cannot be able to self-inject. But [they were] given assurance that they can upon training. And after demonstrating to them the injection procedure, they were curious and some clients told me that it's simple and they can manage to give injection to themselves.

On average, clients reported that they were trained to self-inject for approximately 20 min. Most clients reported one practice injection and some reported two. Providers were trained to encourage women to practice injections into a salt- or sugar-filled condom.

On average, providers said that training each client to self-inject took approximately 27 min (range 10–60 min). Overall, providers described using an average of two practice injections to train each client (range one to four). Providers said that the number of practice injections depended on the client, with some needing more practice injections and others requiring fewer.

### 3.3. Storing and remembering when to reinject

Providers were trained to instruct women to store DMPA-SC in a safe place out of reach of children or animals, and away from direct sunlight and extreme heat or cold temperatures. All providers said they instructed clients to store DMPA-SC away from children, and about half said they told clients to store DMPA-SC in a cool, dry place away from direct sunlight. A few CBPs said they told clients to store DMPA-SC at room temperature. Some reported telling women to keep DMPA-SC in bags or drawers and emphasized the importance of storing DMPA-SC where it would not be damaged (e.g., by other people or rats or cockroaches).

Most clients reported storing DMPA-SC in a bag (e.g., handbag, suitcase, clothes bag) in their homes, and several also reported storing DMPA-SC “up high.” Clients most often chose their storage locations to keep DMPA-SC away from children and others (e.g., so they would not injure themselves or damage the unit). A few mentioned storing DMPA-SC where it could be kept cool. For example, a client said, “I stored it at good and cool place...The drug was in a wrapper already so I placed them in a plastic bag which was placed inside a bag which was hung on the wall by a nail.”

As instructed, all providers said that, at enrollment, they gave clients calendars with reinjection dates circled to remind them when to reinject. When asked how they helped clients remember when to reinject, two thirds of providers mentioned giving clients reminder cards, writing the dates in their health passports and/or giving clients written self-injection instructions.

Most clients reported using the calendar they received during study enrollment to remember when to reinject DMPA-SC. For example, this client described:

They gave us a calendar with the dates of reinjection circled. So, I was just looking on it [and] when the month reached I was counting the dates up to the date of reinjection and self-inject. For example, they told me to self-inject on 17 May, so after I reached the month of May then I started counting the days up to 17 where I self-injected. Most clients said their husbands knew about their study participation, and most husbands who were aware supported the clients by reminding them of their reinjection dates. For example, one client said, “At first, my husband reminded me that your date for reinjection has attained, then I went to verify by checking the given date on the calendar, and I found that he was right, then I just took my injection and self-injected.”

Two clients said their friends reminded them when to reinject. A few clients said they referred to their health passports or written self-injection instructions or contacted a study provider to remember when to

**Table 2**  
Provider characteristics

|   | Number of CBPs | Number of HSAs        | Total                  |
|---|----------------|-----------------------|------------------------|
| Total   | 6              | 6                     | 12                     |
| Sex   |                |                       |                        |
| Female  | 3              | 5                     | 8                      |
| Male  | 3              | 1                     | 4                      |
| Average age in years (range)                    | 45 (31–62)     | 36 (30–40)            | 41 (30–62)             |
| Average years providing FP (range)              | 13 (2–26)      | 9 (3–15) <sup>a</sup> | 11 (2–26) <sup>a</sup> |
| Prior experience giving subcutaneous injections | 5              | 2 <sup>a</sup>        | 7 <sup>a</sup>         |
| Prior self-injection training                   | 2              | 0                     | 2                      |

<sup>a</sup> One HSA was not asked this question.

reinject. Few clients said they missed a target reinjection date, but all said they remembered within the allowable reinjection window.

### 3.4. Self-injecting DMPA-SC

Overall, the clients we interviewed reported positive experiences with self-injection and said they needed little support after being trained. Clients said they nearly always injected themselves rather than having another person inject them. One client said she had a friend inject her once, and another had her husband inject her once. Few clients said they followed up with a study provider after enrollment, and when they did, it was mainly because they had trouble activating DMPA-SC. One client said, “A certain day I failed to open properly. I went to the clinic and explained to the nurse and I was told that I failed to open this and it was opened for me and I injected myself right there.”

The majority of clients said they found self-injecting easy; however, some reported forgetting to activate DMPA-SC and having trouble squeezing the reservoir. For example, one client described, “Inserting the needle on the skin was not much difficult but pressing the reservoir to release the contents because you shake the unit then you insert the needle on the skin and press the reservoir, it was a little bit hard to press and it required some small strength to do it.” Further in the interview, she said that she had later “mastered” this issue.

Just over half of providers we interviewed (mostly HSAs) said that clients followed up with them by phone or in person after study enrollment. The reasons clients followed up were to request a new DMPA-SC unit (one client lost a DMPA-SC unit, while two released the medicine outside of their body), for refresher trainings or to ask questions about DMPA-SC, and because they forgot their reinjection dates.

We did not ask clients about injection locations or side effects, but most participants raised these topics spontaneously. Most clients mentioned that injecting the thigh was easier than the abdomen. The main reason clients found it difficult to inject the abdomen was fear of the drug or needle going into the abdomen, as one client explained: “It was difficult, since we were afraid of injecting in the stomach, otherwise the intestines.” Approximately half of clients spontaneously mentioned experiencing side effects, usually related to injection site pain, nausea, menstrual bleeding changes, or backaches. However, the side effects were tolerable for the majority of clients. Almost half of the clients interviewed mentioned experiencing no or fewer side effects using DMPA-SC compared to DMPA-IM.

### 3.5. Disposing of DMPA-SC

Providers were trained to instruct women to dispose of used DMPA-SC units by first putting the unit in a puncture-proof container with a lid for safe transport and then throwing the unit out into the pit latrine; alternatively, they could give it to a health worker to be put in a safety box at a clinic. All providers reported instructing clients during enrollment to dispose of used DMPA-SC in a pit latrine. Almost half of providers said they told clients they could burn used DMPA-SC, and a few said to put used DMPA-SC in a bottle before disposing of it in the pit latrine.

All clients reported disposing of used DMPA-SC in pit latrines, and a few said they first put it in a plastic bottle before disposing of it in the pit latrine. Clients most commonly chose their disposal location to keep used DMPA-SC away from children and prevent injury to children or others. For example, one client said, “[I disposed of them] In the toilet...I knew that if I disposed them in a bin, children would find them or somebody would step on them.”

### 3.6. Recommending DMPA-SC self-injection

Almost all clients said they preferred DMPA-SC over DMPA-IM, mostly because they could self-inject DMPA-SC and would therefore save time and money by not having to travel to a clinic or HSA for family planning. Other reasons clients preferred DMPA-SC or DMPA-SC self-

injection included feeling that DMPA-SC increased privacy and confidentiality, not having to worry about provider unavailability or stock outs, the perception that DMPA-SC has few side effects, and DMPA-SC causing less pain at the injection site and having a smaller needle size compared to DMPA-IM.

All clients said they would recommend DMPA-SC self-injection to women outside study for the same reasons they reported preferring DMPA-SC. One client said, “If you are in the home injection group you don't waste resources or money to give a cyclist [to travel to a provider].” And another client said, “I felt good because I realized that I will be getting help easily...I will be injecting myself on the given date without going to see a health assistant.”

All providers preferred DMPA-SC self-injection compared to DMPA-IM, mainly because it reduces their workloads and saves them time. For example, a CBP described:

It will reduce our workloads if more self-injection clients are enrolled, since you can only meet clients once a year during registering, training, and supplying Sayana Press. Unlike Depo that requires to meet client every three months. I see the possibility of registering more clients in self-administering group if the Minister of Health approves Sayana Press. In addition, self-administering of Sayana press reduces work pressure at the clinic level.

Providers thought DMPA-SC self-injection was more convenient for women, would save them money and time for transport as well as time spent waiting at the clinic, and would affect women less in cases of stock outs since they would not have to return to the clinic every three months. Some providers also mentioned that DMPA-SC is easy to administer, primarily because it has an all-in-one design, and that self-injection of DMPA-SC increases access to family planning for women and is more confidential than going to a facility.

All providers said they would recommend DMPA-SC self-injection outside of a study context mainly because they felt it would save women time. Providers' main recommendation related to introducing DMPA-SC into their communities was to sensitize communities. One CBP suggested:

My recommendations towards Sayana Press in a community which is totally not aware of Sayana Press are: firstly, use of the community-based drug agents so that they should be aware of Sayana Press so that they should be able to answer questions in their community where they live. Secondly, use of health surveillance assistants, they also live together with clients in their villages. They provide services like weighing children and pregnant women and community sensitization. These [HSAs] may help to remove any misconceptions at community level. Lastly, involve community leaders and religious leaders. These people should also be given information of Sayana Press too.

Other recommendations from two CBPs and an HSA included more follow-up for self-injection clients, such as home visits and refresher trainings, and giving clients at least a year's supply of DMPA-SC.

## 4. Discussion

These findings are from one of the first studies investigating DMPA-SC self-injection in a LMIC. This is the first study with a qualitative component that explores in-depth experiences of women who have self-injected and providers who have trained and supported women to self-inject. Overall, clients and providers we interviewed reported positive experiences with DMPA-SC self-injection. Clients felt that DMPA-SC self-injection saved them time and money, and providers felt that it reduced their workloads and saved them time. We found that both CBPs and HSAs successfully trained clients to self-inject DMPA-SC and that clients safely and appropriately stored and disposed of DMPA-SC. Detailed quantitative information from the main trial about women's experiences self-injecting, remembering when to reinject, and where

they stored and disposed of DMPA-SC is consistent with these findings and presented elsewhere [10].

Our findings contribute to the growing body of evidence of the feasibility [5,6] of DMPA-SC self-injection and acceptability of the practice [3,4,7] in LMIC settings. Specifically, we found that clients in Malawi had similar positive experiences with self-injection as those who participated in studies in Uganda and Senegal; like the women in Malawi, they also felt that self-injecting DMPA-SC was easy and preferable compared to DMPA-IM [5,6]. Experiencing fewer side effects has been previously documented as a reason women prefer DMPA-SC compared to DMPA-IM [4,11]. In our study, almost half of clients spontaneously mentioned experiencing no or fewer side effects using DMPA-SC compared to DMPA-IM.

Despite many clients reporting supportive husbands in our study, clients and providers noted that DMPA-SC increased privacy and confidentiality surrounding contraceptive use, echoing findings from previous studies of DMPA-SC acceptability in sub-Saharan Africa [3,4]. One eligibility criterion for joining the trial was that women should not be at risk for violence if someone found out they were using DMPA-SC. It will be important to augment our findings with the perspectives from more discrete contraceptive users in the future.

Most clients in our Malawi study reported storing DMPA-SC in a bag. This was also the most common storage location for clients in a self-injection study in Uganda [6], but it differed from clients in Senegal [5], who mostly stored DMPA-SC in an armoire or dresser. Similar to Senegal, we found that clients commonly used a calendar to remember when to reinject. We also found that a few clients encountered difficulty with activating DMPA-SC and pushing the reservoir, as was reported in Senegal. Like Uganda, we found pit latrines to be the preferred disposal location, whereas in Senegal, only half of the clients disposed of DMPA-SC in pit latrines. Unlike in Uganda, only a few clients in our study reported placing used DMPA-SC in a puncture-proof container prior to discarding it in the pit latrine, and very few providers said they trained women to do this.

This study furthers our understanding of the practice of self-injection by incorporating providers' experiences and recommendations on topics such as the number of practice injections, time spent training and ideal candidates for self-injection. Based on our findings, we have several recommendations for those planning to implement DMPA-SC self-injection in similar settings. We recommend that providers plan to train clients for at least 30 min and that they emphasize and repeat the steps on activating and injecting DMPA-SC during the training, as these were the most difficult steps for clients. We also recommend planning to use up to four, but an average of two, practice injections per client trained. Providers should also explain to women that injecting the abdomen (not at the navel) is safe. Trainings for both providers and self-injection clients need to emphasize the first step of placing used DMPA-SC into a puncture-proof container before discarding it in the pit latrine. Finally, we recommend providing self-injectors with calendars to help them remember when to reinject.

This study had several limitations. Our intent was to get self-injectors' experiences across the trial, from early discontinuers to those who completed the trial, but the original sample had very few early discontinuers; thus, we were unable to get in-depth perspectives from discontinuers. In addition, our study only included adult women seeking family planning services in rural Malawi; therefore, our results may not be generalizable to women of other ages or other parts of the world. Furthermore, women who are willing to join a randomized controlled trial, especially those who accept self-administration, may be different than those who are not willing to do so. Additionally, many different interviewers conducted interviews and had somewhat inconsistent probing, which affected our ability to summarize certain data; for example, some clients may have included other study-related procedures, such as obtaining informed consent, in their time estimates for how long they were trained to self-inject. Some interviewers and participants had difficulty understanding the intent of some of the questions, and this led to noncomparable information for some of the questions. Finally, as with all qualitative data,

we relied on self-report; therefore, recall and social desirability biases may have influenced participants' responses.

Despite these limitations, this study provides practical information and recommendations that policymakers and implementers can use for introducing and/or scaling up DMPA-SC self-injection in similar communities. The generalizability of our findings is strengthened because we had public-sector providers and community health workers train women to self-inject within their normal service delivery contexts in public-sector family planning clinics in rural communities in Malawi. We also provide in-depth information from both clients' and providers' perspectives, which gives a more complete picture of one of the first experiences implementing DMPA-SC self-injection in an LMIC setting and the first experience in Malawi.

A barrier to rapid programmatic uptake of DMPA-SC is its anticipated higher cost relative to DMPA-IM. Costs may be significantly reduced if DMPA-SC is self-administered, however, allowing for more efficient use of resources, such as providers' time, and lower opportunity costs for women, who would not need to spend money or time traveling to see the provider as often as with DMPA-IM. Nonetheless, the cost savings of these potential efficiencies need to be weighed against costs of training and supporting women to self-inject, as well as advance provision of contraceptive supplies that may potentially not be used by women who discontinue. A potential future research question to explore is whether group self-injection trainings are acceptable, effective and efficient. While the most cost-effective ways to implement DMPA-SC self-administration still need to be identified, in this qualitative component of the trial, we found that women and providers in Malawi had positive experiences and that they highly recommended this practice. DMPA-SC self-administration should be made available in LMIC settings to expand contraceptive options and access.

## Acknowledgments

The FHI 360 project team included Ms. Leigh Wynne as the research utilization specialist; Ms. Silver Wevill as clinical research manager; Ms. Tomisha Turnage as research assistant; Ms. Kelly Feldman as budget analyst; Ms. Lalitha Venkatasubramanian as data manager; Mr. Justin Dash as programmer; Dr. Kavita Nanda as medical monitor; Ms. Jill Sergison as medical coder; Dr. Lakshmi Venkatakrisnaiah as regulatory liaison; and Dr. Mario Chen, Ms. Rachael Fuchs and Ms. Sophie Gao as biostatisticians. Drs. Kenneth Maleta, John Stanback, Donna McCarraher, Douglas Taylor, Laneta Dorflinger and Timothy Mastro advised on this study, and Dr. Natasha Mack edited the manuscript. Ms. Tharnija Lalbahadur of SCT Consulting served as the clinical research monitor. In addition, special acknowledgment goes to the staff supporting this study from the University of Malawi, College of Medicine, and the Ministry of Health family planning providers in Mangochi District.

## Funding

This work was made possible by the generous support of the American people through the U.S. Agency for International Development (USAID) and by the Children's Investment Fund Foundation (CIFF). The contents are the responsibility of FHI 360 and do not necessarily reflect the views of USAID, the U.S. Government or CIFF. Financial assistance was provided through the Advancing Partners & Communities (APC) agreement funded by USAID under Agreement No. AID-OAA-A-12-00047, beginning October 1, 2012. APC is implemented by JSI Research & Training Institute in collaboration with FHI 360.

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