Gauging the Impact of MomConnect on Maternal Health Service Utilisation by Women and Their Infants in Johannesburg, South Africa

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Gauging the Impact of MomConnect on Maternal Health Service Utilisation by Women and Their Infants in Johannesburg, South Africa

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Cover photo, courtesy of Johnson & Johnson: Moms-to-be Eunice, Evelyn, and Kgomotso receive health information by text throughout their pregnancy now that they are enrolled in South Africa's MomConnect mobile health program.

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ABBREVIATIONS

ANC	antenatal clinic
ART	antiretroviral therapy
EDD	estimated due date
EPI	expanded programme on immunization
MAMA	Mobile Alliance for Maternal Action
mHealth	mobile health
MNCH	maternal and neonatal child health
NDOH	National Department of Health
REDCap	Research Electronic Data Capture
RHI	Reproductive Health and HIV Institute
SMS	short messaging service
WHO	World Health Organization

INTRODUCTION

Background

South Africa did not achieve Millennium Development Goals #4 and #5 aiming to reduce child mortality and improve maternal health by 2015 (Mmusi-Phetoe, 2016). Improved retention in maternal health services is essential to meet these goals. This requires innovative retention solutions, such as increasing patient health knowledge and rights, to improve maternal health and related health systems strengthening indicators within the country.

Globally, health systems are expected to provide high-quality services to diverse populations (rural, peri-urban, and urban). Scalable services that are cost effective, reliable, and sustainable are in great demand.

Health information promotion by mobile phones (mHealth) has been proposed to address these issues, but such an intervention requires rigorous enquiry (Kay, 2011). Data so far on the effects of mHealth on maternal health and infant-related patient outcomes are encouraging but limited (Lester, et al., 2010; Pop-Eleches, et al., 2011). Most mHealth initiatives are small-scale pilot projects (Kay, 2011). Moreover, Africa lags other World Health Organization (WHO) regions in the implementation of mHealth programmes. Previous studies have looked at the use of mHealth to improve maternal health outcomes and service uptake (Ngabo, et al., 2012; Chib, Lwin, Ang, Lin, & Santoso, 2008; Jordan, Ray, Johnson, & Evans, 2011; Evans, et al., 2014; Hoff, Martínez, & Lacoursiere, 2011; Coleman, et al., 2017). Still many questions around efficacy remain.

Description of the Problem

South Africa faces several systemic access barriers to sustainable and comprehensive maternal and neonatal child health (MNCH) care (National Committee for Confidential Enquiries into Maternal Deaths, 2013). A United Nations Children's Fund (UNICEF) report highlighted these barriers in South Africa, such as insufficient health-care infrastructure, staff, counselling, information, and communication within the health system and between health service providers and patients (Kelly, Hajiyiannis, & Rau, 2009).

The negative effects of these barriers have been decreasing in South Africa. Antenatal clinic (ANC) coverage before delivery reaches more than 90 percent of the target population and antiretroviral therapy (ART) service and delivery in a health facility reaches 100 percent (Wits Reproductive Health and HIV Institute [RHI], 2012). However, ANC visits by the 20th week of pregnancy have remained low at about 50 percent (Wits RHI, 2013); WHO recommends that pregnant women have their first ANC visit by the 12th week (WHO, 2016).

Mobile Health Interventions

High mobile phone ownership and finite resources for other ways to improve health services have led to many mHealth interventions worldwide. More than 80 percent of South African households now have mobile phones (South African Advertising Research Foundation, 2014), indicating that these devices are well placed for large-scale interventions to improve health. Mobile phones have been shown to improve patient retention in care and can provide relevant health information to patients (Coomes, et al., 2011), both of which are important in any health system.

Evidence from research done on the MAMA South Africa (MAMA SA) mHealth programme introduced in 2012 showed positive results for women who received the mHealth messages, compared to women who received standard patient care (Coleman, et al., 2017). Women who received the mHealth messages attended more ANC visits on average. They were more likely to attend at least four ANC visits and have

a normal vaginal birth, and were less likely to deliver a low birthweight infant and have completed the maternal health continuum of care up to one year. Non-significant trends were also observed for increased immunisation attendance, increased attendance to infant HIV testing at six weeks postnatal, and testing for HIV sooner overall. MAMA SA was initiated with funding from USAID, Johnson & Johnson and mHealth Alliance.

Despite these gains, most mHealth interventions have not scaled up beyond the pilot phase and evidence of large-scale effectiveness remains relatively thin (Tomlinson, Rotheram-Borus, Swartz, & Tsai, 2013).

MomConnect

Recognizing the need and potential for broader mHealth applications, South Africa's National Department of Health (NDOH) initiated MomConnect, the world's first nationwide mHealth intervention, in August 2014. The aim was to register all pregnant women into a national system to receive preventative health messages and ultimately improve MNCH services and outcomes.

The programme uses a short messaging service (SMS) platform that sends stage-based educational ANC information to mothers via mobile phones during pregnancy, and continues sending child health information for one year after delivery.

The content of the MomConnect educational messages was contextualized to the South African environment. Notably, the NDOH included a help desk component in the MomConnect platform so that the women could ask specific health questions and provide feedback on the health services they received at their ANC clinic.

More than half a million women in South Africa joined MomConnect within its first year. This research was proposed to help understand the programme's impact on maternal health utilisation and neonate birth outcomes.

Study Hypothesis

Our hypothesis was that using MomConnect to send pregnant women bi-weekly, informative, and supportive direct SMS(s) timed to the month of pregnancy is a feasible and cost-effective strategy for increasing maternal health service utilisation by pregnant women and their infants attending public health facilities in Johannesburg, South Africa.

Main Aim

Our main objective was to understand the maternal health service uptake differences between MomConnect users and non-MomConnect users in Johannesburg's health subdistrict, Region F. The outcomes of interest are related to utilisation of facility-based maternal health services and to birth delivery, such as: attendance to ANC visits, maternal and infant HIV testing, infant birthweight at delivery, and infant expanded programme on immunization (EPI) attendance and uptake.

METHODS

Study Design

This is a multi-site retrospective case-control study using patient surveys and clinical records. The study compared two cohorts:

1) Women who registered in MomConnect during their pregnancy (intervention)

2) Women who did not register in MomConnect during their pregnancy (control)

Setting

During ANC care, nurses in South Africa typically provide vitamin and mineral supplements, and recommend all ANC patients attend at least four ANC visits before they deliver.[1] All participants in this study received ANC care in healthcare subdistrict Region F in Johannesburg's inner city after September 1, 2014, and delivered their babies before July 1, 2015 at one of two sites: Shandukani Maternal Health Centre or Charlotte Maxeke Johannesburg Academic Hospital.

The inner-city area of Johannesburg has an estimated 1 million residents, making it one of southern Africa's most densely populated areas, with overcrowding, poverty, crime, substance abuse, and sex work. The area has a well-established programme for the prevention of mother-to-child transmission (PMTCT) of HIV through the HIV testing and antiretroviral access programme. However, actual testing levels, linkage to care, and retention are difficult to measure, due to the transient nature of the community.

Intervention Overview

MomConnect offers free, one-way, twice-weekly SMS messages featuring stage-relevant maternal health information for all pregnant women who are registered at any South African ANC facility. The women receive messages from the date of sign up to one-year postnatal. The content of each message is stage-based (connected to the woman's expected date of delivery), and covers topics such as vaccination and check-up reminders, exclusive breastfeeding recommendations, psycho-social parenting tips, baby development, and HIV testing.

The message content was customised for the South African context to cover ANC and EPI messaging. Similar content was used in the MAMA (Mobile Alliance for Maternal Action) SMS service in Johannesburg from 2012-2014 and the "Text4Baby' service which launched in the USA in 2010, both of which have shown encouraging results (Evans, et al., 2014; Hoff, et al, 2011; Coleman, Chan, Black, Thorson, & Erickson, unpublished).

Women who receive the MomConnect messages are not expected to reply and may opt out of the service at any time. However, MomConnect users are offered support and are invited to provide feedback on their clinic experiences through the MomConnect help desk.

Rationale for This Research

As the first nationwide mHealth programme in the world, MomConnect provides a unique opportunity to assess mHealth effectiveness on a national scale. This research gauged the maternal health service uptake

[1] The sites of data collection can expand outside Johannesburg (and even nationally) should it be requested and funding is made available.

in the study cohorts, which provided data for NDOH to improve MomConnect and inform health programming decisions nationally.

Both the research team and NDOH recommended the development of a nationally representative outcome assessment design prior to the start of the operations research. Large-scale outcome assessments often require months to develop, including lengthy processes for ethics approval, followed by adequate time for testing of study tools, proper training of field staff, and field data collection. This posed a challenge for NDOH, which needed timely data for programming decisions. Therefore, the research team and NDOH agreed that this research could build on the MAMA study, which already had existing ethics approval that could be modified to allow the study to be conducted in sub-district Region F of Johannesburg's inner city. Thus, this approach was on a much smaller scale, but it is hoped it will still provide insight and evidence on MomConnect's effectiveness on selected maternal health services and delivery outcomes.

Inclusion/Exclusion Criteria

Women included in the study had to meet the following criteria:

- They were more than 18 years of age at study inclusion.
- They had received ANC services on or after September 1, 2014 at one of the public healthcare facilities within Johannesburg's Region F health subdistrict, run by the Gauteng or Johannesburg Departments of Health.
- They had delivered a live baby at Shandukani Maternal Health Centre or Charlotte Maxeke Johannesburg Academic Hospital (CMJAH) delivery sites prior to July 1, 2015.

Women were excluded from the study for any of the following reasons:

- They did not meet the inclusion criteria.
- They were unwilling to participate in the study.
- They experienced the death of infant under 12 months of age during the study period.

Intervention Arm

Participants in the intervention cohort were randomly selected from the 3,563 women who during their pregnancies registered in MomConnect at one of the participating Johannesburg Region F health district ANC sites between the programme's launch in August 2014 and August 31, 2015.

Control Arm

The control arm consisted of women who received ANC care from the same public health clinics, but were not registered in MomConnect. Each control participant was "matched" with a MomConnect intervention-arm participant who utilised the same ANC facility and delivery site, and who delivered a baby within five days of the intervention participant. Matches were done using ANC cards at the delivery site.

Participant Identification and Recruitment

The research team found 3,563 mothers registered to the MomConnect DHIS2 database during the relevant period. Researchers called the telephone number listed for each mother asking her to participate in the study and, if she agreed, to then identify the site of her baby's delivery. Up to 10 calls (one call per

day) were made to each mother until contact was made. If the delivery site was one of the two participating delivery sites, the study team searched for the mother's ANC card at the delivery site. (In South Africa, ANC cards are assigned to mothers at their first ANC visit and are used to record dates of ANC visits and clinical and antenatal health information. ANC cards are stored at delivery sites after the baby is born.) When an ANC card was found, it was collected along with another ANC card from a woman who was not a MomConnect user and who had delivered the same week and attended ANC services at the same clinic, for the case-control. Potential participants were contacted and invited to come to the Wits RHI office to receive full information about the study, participate in an interview, and provide information from their infants' Road to Health (RTH) booklet. (Like the ANC cards, RTH booklets are assigned to infants after delivery and are used to record infant health information, such as weight and immunization records.) Each mother who gave her informed consent received a telephone voucher worth R50.

Data Collection

Wits RHI research staff asked each study participant to confirm her name, date of birth, country of birth, and household income. Data about participants' clinical ANC visits attendance dates, estimated due date (EDD), and other related data were collected from the ANC cards and entered into REDCap, a secure electronic research database operated and hosted by Wits University.

Primary Outcome

The primary study outcome is a measure of each participant's attendance at four or more ANC visits prior to delivery, using a binary yes/no outcome taken from the total number of ANC visits attended by a participant.

Secondary Outcomes

Secondary outcomes are:

- total number of ANC visits attended
- percent of individuals attending at least five ANC visits
- percent of infants with complete vaccination coverage during the first year of birth
- attendance to all DoH recommended maternal health visits (binary yes/no for a composite of 4+ ANC visits plus all vaccinations up to one year of age)
- infant weight at birth (in grams)
- number of interactions with MomConnect help desk (MomConnect users only; data not available at publication)

Data Analysis

Analysis of the primary outcome was done based on a chi-squared test comparing the proportion of individuals in the two study arms and within study sites.

For secondary outcomes, chi-squared tests were used for binary variables; means with 95 percent confidence intervals (CI) were analysed for ANC visits and students *t*-tests were analysed for continuous variables.

Sample Size

Given the similarity between MAMA SA and MomConnect, the study team calculated sample size for this study based on the baseline and effects that were seen in the MAMA SA research study conducted in 2015. Using this information, we expected that the percentage of women attending four or more ANC visits would be 15 percent higher in the intervention group than in the control group (as seen in the MAMA research). With 90 percent power and an alpha of 0.05, a sample size of 217 individuals per arm was set as the recruitment target.

Ethical Considerations

This research project received approval from the NDOH and the University of Witwatersrand Human Research Ethics Committee (Medical), under clearance certificate number M140984.

RESULTS

Overview

Table 1 highlights our summary of how participants were recruited for our study. The research team contacted the 3,563 mothers who attended their first ANC visits on or after September 1, 2014 and delivered their babies before July 1, 2015. A total of 1,100 MomConnect users delivered live babies at Shandukani Maternal Health Centre or Charlotte Maxeke Johannesburg Academic Hospital (CMJAH). The research team identified 853 ANC cards and matched them with 1,056 control ANC cards. The research team was able to contact 516 of the MomConnect users with identified ANC cards; 311 of those contacted agreed to participate and attend the interview. However, only 115 MomConnect users ultimately attended and completed the interview. Of those, 17 were not matched with a control participant and were not included in the maternal and infant health data analysis. A total of 131 participants were included in the analysis (98 MomConnect users in the intervention arm and 33 non MomConnect users in the control arm). Each of these attended the in-person interview and provided their infant's RTH booklet.

Table 1. Summary of participant recruitment

	Number of Participants	
	Intervention	Control
Number of mothers called for screening	3,563	**N/A**
Number of mothers that delivered at study delivery sites	1,100	**1,056**
Number of ANC cards pulled at study delivery sites	853	1,056
Number of mothers asked for study participation	516	481
Number of mothers agreed to participate and attend interview	311	121
Number of mothers that attended interview	115	33
Number of mothers included in ANC analysis	98	98
Number of mothers included in EPI coverage analysis	33	33

The discrepancy in study arms was because 65 of the matched control participants did not attend the planned interview. However, these participants did agree to participate in the study and share their ANC cards for analysis. For this reason, the results section is broken into two sections:

- All participants: An analysis of ANC data only and includes 196 participants for which ANC results are available
- Interviewed participants: An analysis of all relevant maternal and infant health data for the 66 matched individuals: 33 MomConnect participants and 33 control participants.

Despite the offer of participant reimbursement, attendance at the interview was less than 20 percent of potential participants. The target sample size was not achieved. Therefore, the data could not be analysed for statistical significance as intended. The following results are descriptive findings.

All Participants

ANC Data

ANC data for 196 individuals were identified with the data transcribed, cleaned, and analysed. Of the 196 participants, half (98) were in the intervention arm (MomConnect) and half were in the control arm. The

mean age of participants was 30.6 years for MomConnect mothers and 29.3 years for mothers in the control group.

Figure 1 shows that the number of ANC visits per participant varied between 1 and 10, with an average of 4.3 visits each.

Figure 1. Number and percentage of study participants who attended between 1 and 10 ANC visits, by study arm, for all study participants (n=196)

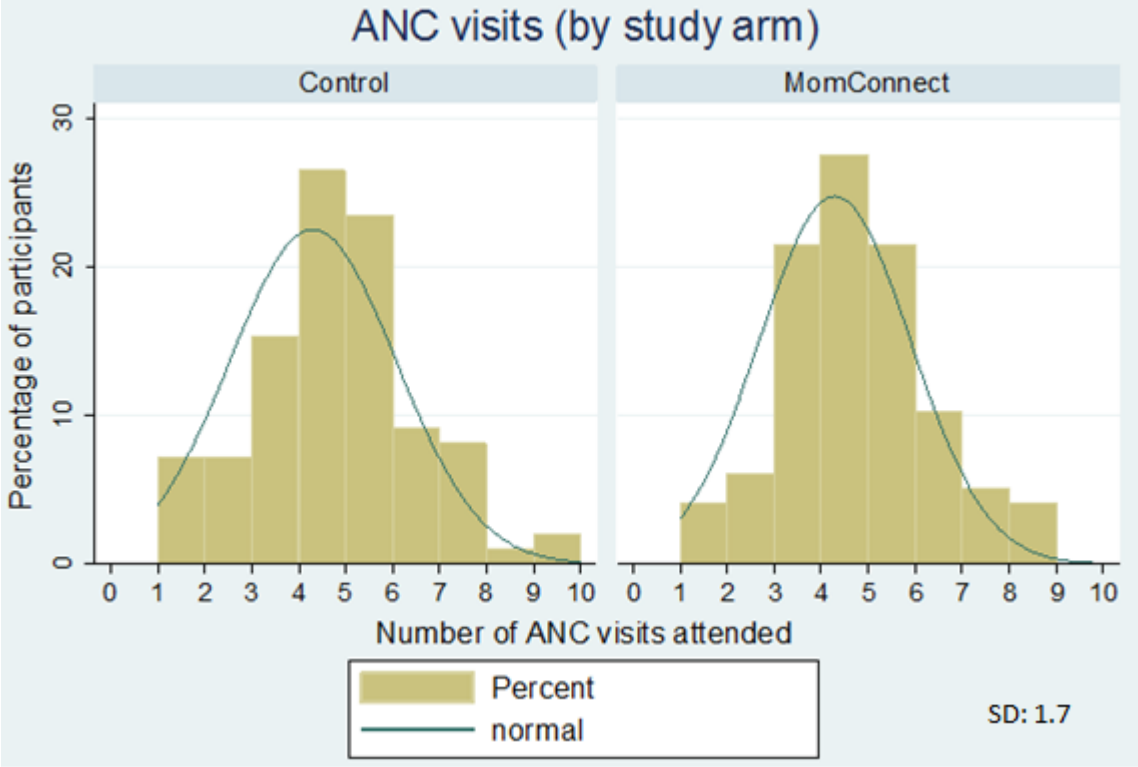


Table 2 shows that both arms of the study had a similar average number of ANC visits (4.29 for intervention and 4.31 for control). MomConnect participants and control participants were found to have a similar likelihood of attending at least four ANC visits (68.4% and 70.4%, respectively). A similar result is found for attending at least five ANC visits (40.8% for MomConnect and 43.9% for control).

Table 2: ANC attendance results for all study participants

	Intervention (n=98)	Control (n=98)
Mean ANC visits	4.29	4.31
% with 4+ ANC visits	68.4%	70.4%
% with 5+ ANC visits	40.8%	43.9%

Interviewed Participants

Data on ANC visits, EPI coverage, and the interviews are available for the 66 participants who were interviewed for the study. Each of these individuals provided their RTH booklet during the study interview, after which all data were transcribed, cleaned, and analysed. Half of the participants (33) were intervention (MomConnect) and half were control. Mean ages for mothers in the intervention and control arms were 30.9 years and 29.3 years, respectively.

ANC Visits

Figure 2 shows the number of ANC visits attended by study arm, and the percentage of study participants in each arm who attended between one and eight ANC visits.

Figure 2. Number of ANC visits and percentage of study participants who attended between 1 and 8 ANC visits, by study arm, for all interviewed participants (n=66)

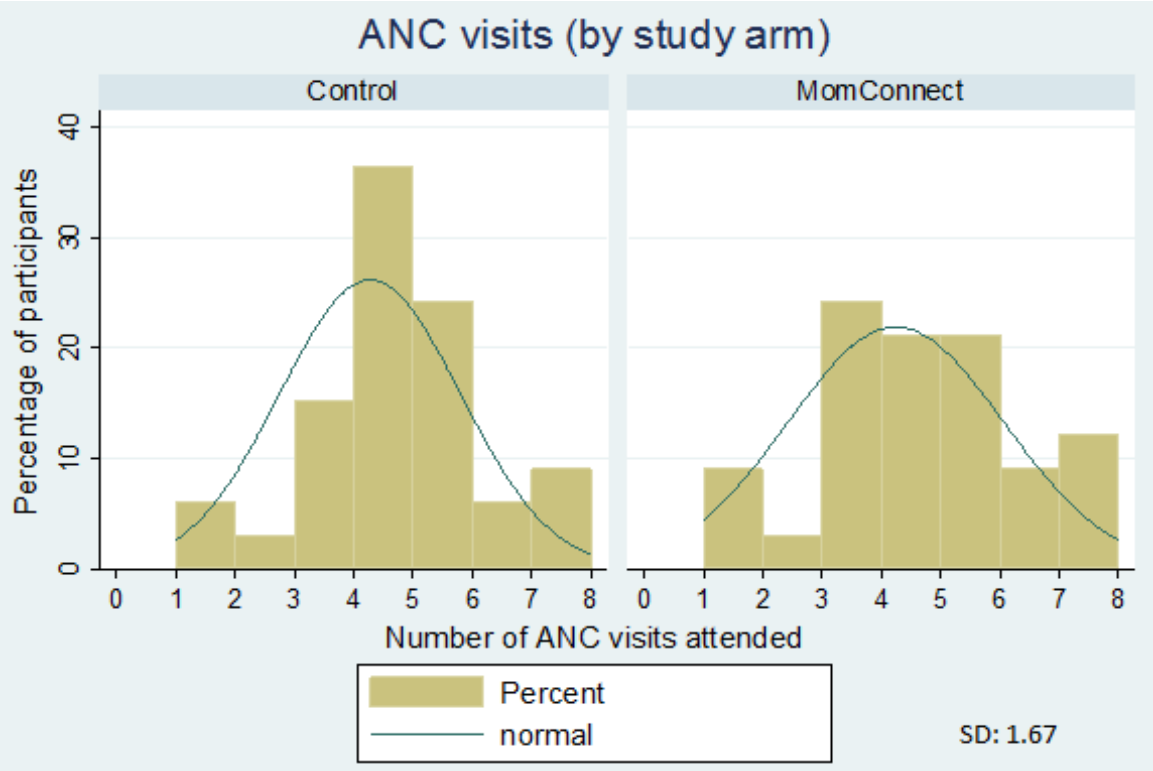


Table 3 shows that participants interviewed in both arms of the study had a similar mean for number of ANC visits (4.24 for intervention and 4.27 for control). There was a higher percentage of mothers in the control group with four or more ANC visits. The percentage of mothers with five or more ANC visits was similar between the two groups.).

Table 3: ANC attendance results of interviewed participants

	Intervention (n=33)	Control (n=33)
Mean ANC visits	4.24	4.27
% with 4+ ANC visits	63.6%	75.8%
% with 5+ ANC visits	42.4%	39.4%

EPI Coverage

Table 4 shows that EPI coverage from birth to one year postnatal was very high in both study arms, with MomConnect users having a slightly higher complete EPI attendance record (97%, compared with 93.9% for the control group).

Complete Coverage: Maternal Health and Infant EPI Attendance

Of the 66 participants in the study, 69.7 percent received complete maternal healthcare and infant EPI coverage, defined by at least 4 ANC visits and complete EPI coverage up to one year of age. Disaggregating by study arm (see Table 4), a higher percentage of mothers in the control arm had complete maternal health and infant EPI coverage (75.8%) than those in the intervention arm (63.6%).

Birth Weight

The weight of the infant at birth was missing for one of the MomConnect participants, which resulted in data for only 65 participants. Of those 65, the mean birth weight was 3.13 kg. Table 4 shows that MomConnect users had a higher average birth weight (3.2 kg) compared to control participants (3.06 kg).

Table 4: EPI coverage, complete coverage, and birth weight of interviewed participants (n=66, except where noted)

	Intervention (n=33)	Control (n=33)
Complete EPI Coverage	97%	93.9%
Complete maternal health and infant EPI coverage	63.6%	75.8%
Infant Birth Weight (n=65)	3.2	3.06

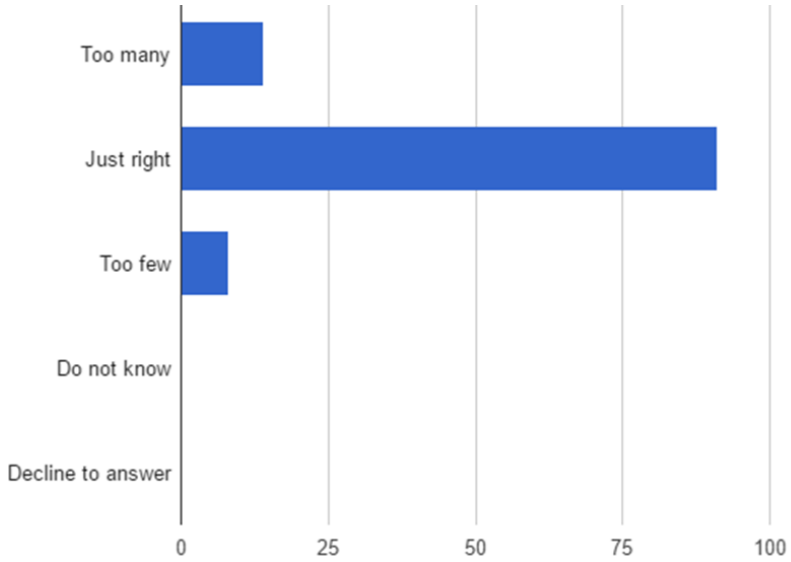
HIV Status

A total of 9 of the 66 individuals recruited were HIV positive. Given the low number of HIV-positive participants, no HIV-related analysis was conducted.

MomConnect User Feedback

All 115 MomConnect (intervention) users who attended the interview were asked specific questions about their MomConnect experiences. Figure 3 shows that a large majority (80.5%) said the number of MomConnect messages sent to them was just right, with a smaller proportion saying there were too many messages (12.4%) or too few (7.1%).

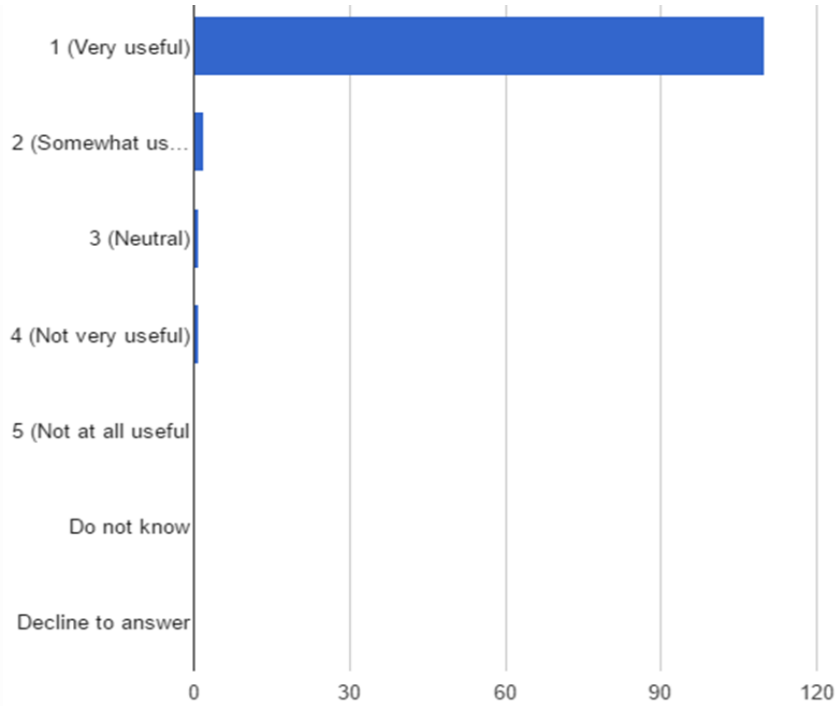
Figure 3. MomConnect experience of message frequency



Number of responses to the question: What do you think about the number of MomConnect messages you received? (n=113)

Figure 4 shows that nearly all MomConnect users (96.5%) said the information they received from MomConnect was very useful. Only one user (less than 1%) said it was not very useful.

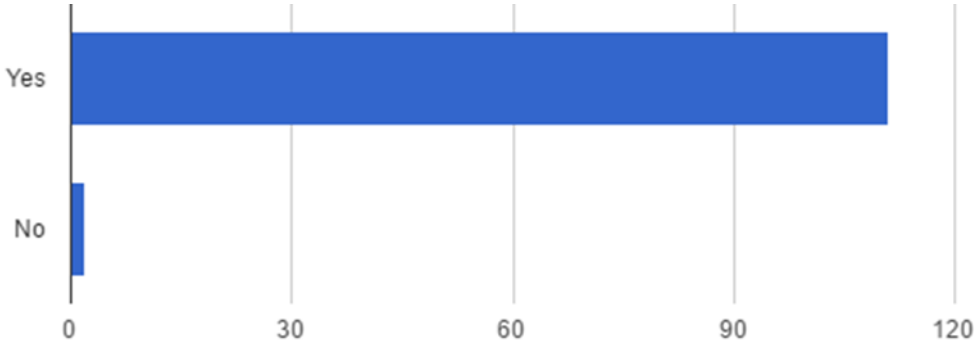
Figure 4. MomConnect participants' views on the usefulness of message content



Number of responses to question: How useful was the information that you received from MomConnect? (n=114)

Figure 5 shows that nearly all MomConnect users (98.2%) said the messages they received helped them make better maternal and infant health decisions

Figure 5. MomConnect participants' use of message content for decision making



Number of responses to the question: Do you feel that the information from MomConnect helped you to make better health decisions or better care for yourself and your baby? (n=104)

DISCUSSION

The low response rate did not allow for comprehensive analysis of the data to determine statistically significant differences in the outcome indicators between the intervention and control groups. Nevertheless, our descriptive analysis did not show any differences between the intervention and control arms. This was unexpected.

No differences were identified between the intervention and control populations for any of the variables of interest: ANC visits, EPI coverage, complete maternal health and infant EPI coverage, and birth weight. However, the feedback from MomConnect users regarding their specific experiences are encouraging. Users indicated they were happy with the message frequency. They said the information within the messages was useful and allowed them to make better decisions about their health and the health of their infants.

The lack of differences between the control and intervention arms is surprising as it appears to counter the findings of the previous MAMA studies, which were conducted at the same facilities and had almost the same intervention (Coleman, et al., 2017; Coleman, et al., unpublished). Those results showed that intervention participants had a statistically significant increase in ANC visits, EPI attendance, and complete attendance to care.

The most obvious difference between the previous studies and this study is that the number of ANC visits attended by the control arm in our study increased by almost 33 percent, from an average of 3.2 ANC visits in the MAMA control group to more than 4.2 visits in both the control and intervention arms in our study. The difference might be due to increased maternal health support provided at participating healthcare sites since MAMA was launched in 2012.

With four ANC visits being the recommended number of visits, there is little reason to increase this number (in a healthy population). We should acknowledge the good work of the healthcare workers and health system for having such a high average number of ANC visits.

Challenges and Limitations

Challenges: During the study period, our team faced challenges in identifying control participants. The study was retrospective (potential participants were contacted by telephone after being identified), and most potential control participants were unwilling or unable to participate in the in-person interview. We theorize that MomConnect participants were more willing to participate because they had signed up for MomConnect willingly and, as shown by the user feedback, were satisfied with the programme. This positive experience could have primed them to have positive feelings about MomConnect and be more willing to engage with MomConnect research. The control participants, on the other hand, were cold-called by the study team, having no previous connection (positive or otherwise) to the research topic. While the study team attempted to engage the potential control participants as much as possible, they were not primed in the same way as the MomConnect group. These challenges resulted in a much lower participant sample size than planned. This resulted in nonsignificant results that may not be representative of reality.

Limitations: This was not a prospective, randomly controlled trial. It had a smaller than intended sample size. The study population does not reflect the general population. The study was conducted in the inner city of Johannesburg, with an urban population that included non-South Africans. Because MomConnect had been launched as the standard of care in South Africa in 2014, the study method was necessarily retrospective; this resulted in several challenges (described above). Although a randomised controlled trial would have negated some of these issues, conducting one was not possible at the time. Thus, the retrospective study method was the best option available. The small sample size is likely the cause of the lack of identified differences between groups. Additionally, the baseline ANC attendance and infant EPI coverage rates were found to be very high and surpassed the government recommended minimums. Conducting the study at a more representative site, or at multiple sites, might have garnered different results.

RECOMMENDATIONS

Because this study's results were not insignificant results, and given the challenges and limitations discussed in the previous section, we recommend more operations research using different methods. With such a high baseline of ANC attendance and EPI coverage, it would be difficult to identify any significant impact of MomConnect at the facilities that were included in the current study. The study should be replicated elsewhere in South Africa in areas that are known to have lower maternal and infant health service uptake. Other larger-scale, less costly studies are also possible, given the vast amount of data available. Here are three options:

- **Conduct a pre-post analysis on ANC attendance at ANC sites across the country**. The total number of ANC visits, as listed in the District Health Information System (DHIS), could be controlled for by adjusting for the number of first ANC visits, resulting in an average number of ANC visits attended per patient. The average number of ANC visits per site pre-MomConnect (early-2014) could then be compared to the average number of ANC visits per site after MomConnect was introduced (mid-2015), which would (likely) show the impact of MomConnect.

- **Use the same data to conduct a post-hoc step-wedge design looking at the introduction of MomConnect at multiple sites.** Since MomConnect was not immediately offered at all facilities across the country, data on actual registration in MomConnect at facilities could be used to gauge when MomConnect was introduced. Using those data, average number of ANC visits conducted at sites could be gauged over time.

  For example, if there were three clinics (A, B, and C) located near one another, and clinic A started offering MomConnect in August 2014, clinic B in March 2015, and clinic C in August 2015, each could be monitored for average number of ANC visits. If an increase in ANC visits followed the introduction of MomConnect in the facilities, it would be reasonable to expect that MomConnect was a significant factor in that increase.

- **Use MomConnect registration data** to make comparisons between ANC sites that have recruited a very high percentage of patients to MomConnect and ANC sites that have recruited a very low percentage of patients to MomConnect.

CONCLUSION

The MomConnect user-specific experiences reported in the study are encouraging. Users seem happy with the message frequency and indicated that the information transmitted by mobile technology was useful and allowed them to make better decisions about their health, and their infant's health. It's also encouraging to see that study participants averaged more than 4.2 ANC visits, exceeding recommendations. However, it's puzzling that there were no significant differences in health service utilisation or health outcomes between the MomConnect users and the nonusers in the study groups. This may be unrelated to MomConnect and more likely related to improvements of the facilities at the included study sites. For this reason, more research is needed on the impact of MomConnect at sites with less optimal maternal and infant care uptake, especially where baseline maternal health indicators are low and patients would benefit most from MomConnect. Additionally, further large-scale research is required, looking at ANC rates across the country since MomConnect was launched.

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