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Testing an Incentive-Based and Community Health Worker Package Intervention to Improve Maternal Health and Nutrition Outcomes: A Pilot Randomized Controlled Trial

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Abstract

Objectives In order to address South Africa's maternal and infant mortality and morbidity rates, patient and community-level preventable factors need to be identified and addressed. However, there are few rigorously implemented and tested studies in low- and middle-income countries that evaluate the impact of community-level interventions on maternal and infant health outcomes. This study examined the impact of a package intervention, consisting of an incentive called the Thula Baba Box (TBB) and a community health worker (CHW) programme, on maternal depressive symptoms, maternal nutrition and intention to exclusively breastfeed.

Method The intervention was tested using a pilot randomised controlled trial consisting of 72 (39 treatment and 33 control) adult women, implemented in a low-income, peri-urban area in Cape Town, South Africa. Data was collected using a baseline questionnaire conducted shortly after recruitment, and an end line questionnaire conducted a week after giving birth.

Results The intervention resulted in a 0.928-point drop in the maternal depressive symptom scale (which ranges from 1 to 8). We find no evidence that the intervention has either a sizeable or precisely estimated impact on maternal nutrition, measured using middle-upper arm circumference. While the intervention has almost no effect on the infant feeding intention of women who own refrigerators, it has a very large positive effect of 3.349-points (on a scale ranging from 1 to 8) for women without refrigerators.

Conclusion A package intervention consisting of psycho-social support, additional tailored health information, and an incentive to utilise public antenatal care services has the potential to increase exclusive breastfeeding intention and reduce maternal depressive symptoms among the economically vulnerable.

Keywords Maternal depression · Maternal nutrition · Exclusive breastfeeding · Maternal health · Randomised controlled trial

Significance

What is already known on this subject? Reducing high rates of maternal malnutrition and depression and improving poor infant feeding practices are necessary to reduce the high maternal and under-5 mortality and morbidity rates in Sub-Saharan Africa.

What does this study add? The research provides preliminary evidence of an intervention which successfully decreased maternal depression and increased exclusive infant feeding intention among a vulnerable sub-group of women in South Africa.

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Introduction

Since the establishment of the millennium development goals (MDGs), global initiatives to improve maternal, neonate and infant health have garnered increased attention. The MDGs were succeeded by the Sustainable Development Goals, which targets the reduction of the maternal mortality rate (MMR) to below 70 deaths per 100,000 live births and under-5 morality ratio to 25 deaths per 1000 live births by 2030 (Desa, 2016). In 2015, MMR and under-5 mortality were approximately 13 and 40.3 deaths per 1000 live births in South Africa (World Health Organization, 2019).

The leading cause of institutional maternal deaths in South Africa is non-pregnancy related infections, such as HIV-related deaths. This is followed by obstetric haemorrhaging and hypertension (Moodley et al., 2020). A key strategy to address these mortality and morbidity rates include identifying, understanding and addressing patient or community-level preventable factors, which are currently poorly tracked at a national level (Moodley et al., 2018). Moodley et al. (2018) identify factors such as access to social grants, knowledge of health needs, and community mHealth programmes or community healthcare worker programmes as methods of providing the adequate support for pregnant women to overcome patient or community level factors which may result in poor health outcomes. There are few rigorously implemented and tested studies in low- and middle-income countries (LMICs) that evaluate the impact of community-level interventions on maternal and infant health outcomes. Existing studies vary from mHealth interventions aimed at increasing utilization (Sondaal et al., 2016), to peri- and postnatal psychological interventions by community healthcare workers (Chowdhary et al., 2014) to community healthcare worker programmes which encourage community engagement resulting in improved take-up of nutritional interventions (Bhutta et al., 2013). In South Africa, the Philani Maternal, Child Health and Nutrition trust is a community healthcare worker-based programme focused on providing health and psycho-social support, thereby sustaining community health. The programme has had significant impacts on women living with HIV completing Prevention of Mother to Child Transmission tasks, post-birth complications (le Roux et al., 2013), psycho-social support for women suffering from postnatal depression (Rotheram-Borus et al., 2015) and the growth of their infants (Tomlinson et al., 2015).

We designed and tested an intervention with the goal of improving maternal, infant and child health by improving the health behaviour of pregnant women in a low-income area in the Western Cape, South Africa. The package intervention consisted of a community health worker (CHW) programme as well as a maternal starter-kit called the Thula Baba Box (TBB), with receipt conditional on antenatal care-seeking behaviour. The box was valued at $27.8 in 2016 and contained various products including baby clothing and blankets, washing products, maternity pads, toys and nursery rhymes, health information, a kangaroo mother-care wrap and condoms.

The two interventions were offered jointly to participants in the treatment group to address the multi-causal and complex nature of maternal and infant health. More specifically, the intervention is designed to address the various social and community factors which may affect health behaviours such as care utilization, exclusive breastfeeding rates, maternal nutrition and maternal depressive symptoms. The intervention was found to have a positive and significant effect on healthcare seeking behaviour, the results of which are reported elsewhere (Rossouw et al., 2019). This article considers the impact of the package intervention on maternal depressive symptoms, maternal malnutrition and intention to exclusively breastfeed.

Maternal Depression

Although there is a paucity of maternal depression rates in South Africa, area-specific research studies have shown that they are comparatively high, ranging between 19 and 39% in the Western Cape (Baron et al., 2015; Brittain et al., 2015; Hartley et al., 2011; Stein et al., 2015). Maternal depression can have adverse health consequences including poor foetal growth (Brittain et al., 2015), and poor bonding between mother and infant (Rossen et al., 2016). High maternal depressive rates have often been linked to psycho-social and socio-economic factors, such as low levels of income, abuse, poor partner support, risky pregnancy conditions and feelings of cultural dissonance (Akiki et al., 2016; Wittkowski et al., 2014). The intervention targets maternal depression with frequent community healthcare visits and providing the necessary psycho-social support for women residing in a low-income area.

Maternal Malnutrition

Maternal malnutrition refers to both maternal undernutrition and overnutrition, the result of a range of socio-economic and bio-medical factors (Davies et al., 2012; Imdad & Bhutta, 2013). There are few estimates of maternal malnutrition rates in South Africa, but the 2016 South African Demographics and Health Survey showed that the incidence of undernutrition among women of childbearing age groups (15–24, 25–34 and 35–44) was approximately 5.9%, 2.1% and 1.8% respectively. Obesity among these age groups were 24.4%, 19.1% and 24.8%, respectively (National Department

of Health, Statistics South Africa, South African Medical Research Council, & ICF, 2019). Malnutrition during pregnancy could result in intrauterine growth restriction, increasing the risk of stillbirth and under-5 mortality (Nannan et al., 2007; Rollins et al., 2007), as well as maternal mortality (Christian et al., 2008). Furthermore, pre-eclampsia and obstetric haemorrhaging are more prevalent among obese compared to normal weight women (Black et al., 2013). Our intervention addressed maternal malnutrition by providing frequent health information to women during CHW visits. Should the intervention result in increased care-seeking behaviour, women should also receive health advice during clinic visits.

Exclusive Breastfeeding

Exclusive breastfeeding is often promoted in resource-poor environments due to its health benefits and the fact that it decreases exposure to poor hygiene and sanitation conditions (Kramer & Kakuma, 2012; Meyer et al., 2007). Exclusive breastfeeding has been positively linked to decreased neonatal mortality (Doherty et al., 2014; Edmond et al., 2006), reduced incidence of infectious diseases (Arifeen et al., 2001; Jones et al., 2003) and reduced neonatal sepsis (Jones et al., 2003). Breastfeeding is beneficial for the woman as well, by decreasing the risk of postpartum anaemia (Stein & Kuhn, 2009) and maternal haemorrhaging (Jones et al., 2003).

While breastfeeding initiation rates are satisfactory in South Africa, duration and exclusivity are low compared to global standards (Meyer et al., 2007). The South African exclusive breastfeeding rate at 6 months was 32% in 2016, a major improvement from dismal 8.3% in 2003 (National Department of Health, Medical Research Council, & Orc-Macro, 2007; National Department of Health et al., 2019). Factors contributing to low exclusive breastfeeding rates in South Africa is a history of unethical formula milk promotion by producers, and mixed messaging resulting in uncertainty on best breastfeeding practices for HIV positive women. The unethical promotion and idealisation of formula milk threatened the exclusive use of breastmilk, and these mixed messages may have translated into severe uncertainty amongst women about best practice (Doherty et al., 2014; Meyer et al., 2007).

Other stressors include low education and income, employment conditions, urbanisation, maternal age, social support, cultural beliefs and access to refrigeration and electricity (Balogun et al., 2015; Trussell et al., 1992). Our intervention supports exclusive breastfeeding by providing psycho-social support and information on exclusive feeding practices, helping shape women's breastfeeding intentions prior to giving birth. Nationally and internationally, community health worker programmes have been used as a tool to increasing exclusive breastfeeding rates (Bland et al., 2008; Haider et al., 2000; McInnes et al., 2000; Rotheram-Borus et al., 2014; Tylleskär et al., 2011), their effectiveness often contingent on their content and frequency of visits. For instance, one intervention study in South Africa saw exclusive breastfeeding rates as high as 77%, but the community health worker programme consisted of 18 visits to women with neonates (Bland et al., 2008). Another South African intervention only had five visits, and the exclusive breastfeeding prevalence between the intervention and the control arms were only 10.5% and 6.2% (Tylleskär et al., 2011).

Methods

We present the results from a pilot, randomised-controlled trial of a package intervention to improve these health behaviours and health outcomes. The package intervention consisted of two components, both of which were presented to women in the treatment group. One of these was a community health worker programme: a programme where local women were recruited and provided health information and psycho-social guidance to women in the treatment group. The second intervention was a cash-in-kind transfer (a maternal starter kit called the Thula Baba Box), offered to women in the treatment group conditional on their antenatal clinic visitation. There was no conditionality attached to the community health worker programme.

Design

The pilot randomised controlled trial (RCT) was conducted between January and November 2015. Ethical approval was obtained from the research ethics committee of Stellenbosch University. Participation was voluntary, and all participants signed an informed consent form.

Study Participants and Study Site

The study consisted of pregnant women aged 18 and older living in a low-resource, low employment environment in peri-urban Cape Town, South Africa. We limited our sample to women who have not yet been enrolled for antenatal care. The area, known as Lwandle-Nomzamo, contains a high percentage of informal housing. A 2011 census estimates the population at 80,346 persons, covering an area of 33,401 square kilometres (Statistics South Africa, 2011).

Door-to-door recruitment (covering the entire area) was used to identify potential study participants, with households in the study area visited twice. Only women who had not booked at a local antenatal care (ANC) clinic were recruited. Given that this was a pilot randomized controlled trial,

power calculations were irrelevant. 100 participants with different gestational ages were identified during baseline.

Randomization

After recruitment and consent, baseline health data was collected. Participants were randomized into either control or treatment group using an on-site lottery. The on-site lottery was conducted by the CHW, but allocation was ultimately decided by the project manager. CHWs asked all eligible women to provide them with their cell phone number. The CHW would then text the number to the project manager, who would then decide whether the pregnant woman was in the treatment or control group based on the third last digit of her number. This was done in order to ensure that the CHWs did not favour any of the respondents and place them into treatment group. Women in the treatment group subsequently received CHW support and offered a cash-in-kind transfer conditional on their attendance of antenatal care clinic visits. Women in the control group received standard clinical practice (no intervention), as well as a $2 voucher or coupon for cell phone data to compensate for their time filling out the survey.

Description of the Intervention

The first component of the intervention was a monthly visit by a CHW. These were women recruited from the community and trained specifically in providing health information and psycho-social support to pregnant women. These services are supplemental (rather than complementary to) clinical practice. Visits ranged between 30 and 90 min and content adapted to the needs of the participant woman. Content ranged from promoting clinic attendance, discussing possible danger signs, nutrition (including smoking and drinking behaviour), infant-feeding options, testing for infectious diseases such as HIV and tuberculosis (TB), and bonding with the infant. The programme also aimed to provide psycho-social and emotional support to the women. Each CHW had her own set of clients (after attrition this amounted to between 20 and 28 clients per CHW). A more detailed description of the CHW programme is included in the supplementary material.

The second component was the conditional incentive of a maternal starter-kit, valued at approximately $27.8 in 2016 prices. It contained a range of products, including baby clothing, a blanket and cloth, a material wrap for carrying the infant on your chest, soap, aqueous cream, baby wipes, plastic balls, health information brochures and nursery rhymes. There were also products for the women, including maternity pads and condoms. The box was made of clear plastic and could be used for storage or as a baby bath. Since receipt of the starter kit was conditional on clinic attendance, missed appointments meant that women received a starter kit that did not contain all of the above-mentioned products.

Possible Causal Transmission Mechanisms

The World Health Organization's Social Determinants of Health model posits that poor health outcomes and health inequalities may result due to a range of structural and intermediary outcomes, and links poor health outcome to the community and social conditions in which people exist (Crear-Perry et al., 2021). Structural determinants include the larger socioeconomic and political context, but it also includes an individual's own socio-economic position, which acts to reinforce social stratification. These structural determinants of health influence health behaviours, material position and psychological factors which in turn results in health-compromising conditions (Hamal et al., 2020). Given that our sample is predominantly from a socio-economically disadvantaged community, the interventions may have an impact on maternal and child health by addressing various material, behavioural and psychological factors. The impact could either be directly, via child health and maternal nutrition information and the psycho-social support provided by CHWs or indirectly, via enabling better choices via CHW support and encouraging earlier and more regular visits to primary antenatal care.

Data Collection

Data was collected using a baseline questionnaire conducted shortly after recruitment, and an end line questionnaire conducted a week after giving birth.

Socio-Economic and Demographic Variables

We report on a range of socio-economic and demographic variables, including the participant's age in years, their employment and marital status (both reported here as binary indicators), self-reported racial category, foreign nationality, household size and the birth order of the current pregnancy. Educational status is reported as a binary variable, indicating whether they completed grade 12. To capture wealth differentials, an asset index is created using multiple correspondence analysis on household assets. Information on the creation of this asset index is included in the Supplementary Material.

Maternal Depressive Symptoms

Maternal depressive symptoms (antenatal and postnatal) are measured using the Edinburgh Postnatal Depression Scale, adapted to the South African setting (Tomlinson

et al., 2015). It monitors depressive symptoms rather than depression. Antenatal depressive symptoms were captured during the baseline questionnaire and postnatal depressive symptoms were captured during the end line survey. The scale ranges from null to eight, with a higher value indicating more depressive symptoms.

Maternal Nutrition

Maternal nutrition is measured using middle-upper arm circumference (MUAC). This is a less costly way of capturing maternal stature and if often used in South Africa (Rollins et al., 2007). While we use MUAC as a continuous variable to monitor change in MUAC in a small sample, it is worth noting cut-off points for malnourishment. A systematic review of the value of MUAC that is associated with adverse birth outcomes considered a pregnant woman as severely malnourished if her MUAC is below 23 cm (Ververs et al. 2013).

Exclusive Breastfeeding

Exclusive breastfeeding rates are proxied for using an adapted infant feeding intention (IFI) scale, measured a week after birth. The scale measures the intended duration and exclusivity of breastfeeding (Nommsen-Rivers & Dewey, 2009) by monitoring the extent of agreement with various statements on breastfeeding. The final IFI value is an additive index ranging between 0 (no intention to breastfed at all) to 8 (very strong intention to breastfeed exclusively for six months).

Data Analysis

Stata version 15 (StataCorp, 2017) was used for analyses. The treatment effect is measured using a binary predictor equal to one if the participant received the package intervention. An ordinary least squares estimator is used to analyse the role of the intervention on the measures of outcomes. For the sake of precision, we include socio-economic and demographic variables, but report on both adjusted and unadjusted results. Both adjusted and unadjusted estimates consider difference in the length of time that respondents participated in the study.

Given the pressing need to improve exclusive breastfeeding rates in South Africa, we also explore how the treatment interacts with a known risk factor that is frequently mentioned in the literature: not owning a refrigerator. This is considered to be a risk factor for exclusive breastfeeding because it complicates the storage of expressed breastmilk, extracted either manually or using an electronic breast pump. We report three sets of coefficients for this treatment interaction analysis, namely the "Treatment group" coefficient (the relationship between those who are in the treatment group and who own fridges and the IFI scale), "The participant does not own a fridge" (the relationship between those who are in the control group and do not own fridge and the IFI scale) and "Treatment*Not own a fridge" (the relationship between those who are in the control group and do not own fridges and the IFI scale).

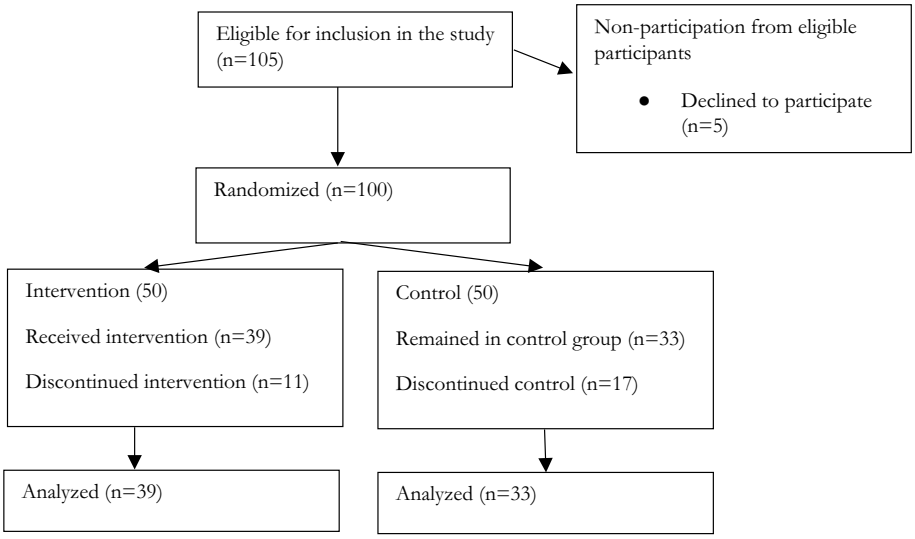

Fig. 1 Flow of participants through the RCT

Results

Study Participants

During the baseline survey, 100 women (50 control and 50 treatment) were found to be eligible for the study. Twenty-eight women were lost to follow-up due to medical abortions (5), moving (10), stillbirths (2), refusals (3), false pregnancy (1), miscarriage (3) and living in an area considered too dangerous for community health workers to access (4) (Fig. 1). There was little difference in the socio-economic and demographic variables of treatment and control groups (see Table 1).

None of differences in covariate means are statistically significant, which demonstrates that a reasonable balance between treatment and control was achieved by our randomisation. However, given the relatively small sample, some of the covariate differences are non-negligible. For example, the baseline difference in education level (grade 12 attained) and birth order (first pregnancy) exceed 25%. We therefore report all treatment effects with and without controls.

The impact of being in the treatment group on the various outcome measures is reported in Table 2. Women in the intervention group scored 1-point lower on the maternal depressive symptoms score: the unadjusted coefficient was -1.099 and the adjusted coefficient was -0.928. Both coefficients were significant.

The effect of the intervention on MUAC is positive, but insignificant. Women in the treatment group observed an impact on their MUAC of 0.465 and 0.263 on the unadjusted and adjusted coefficients respectively. Given that MUAC is used as a continuous variable, a higher MUAC indicates a wider circumference and probability of being overweight.

Treatment group participants score on average one point higher on the IFI scale compared to their control group

Table 1 Characteristics of participants in the treatment and control group. Source: Adapted from (Rossouw et al., 2019)

	Treatment (n = 39) %	Control (n = 33)	p-value
Unemployed	62	73	0.32
Grade 12 attained	21	12	0.35
Married	26	21	0.66
Black African population group	90	88	0.81
Foreign national	41	48	0.53
First pregnancy	21	33	0.22
Identified using a pregnancy test	44	52	0.51
	Treatment (n = 39) Mean (SD)	Control (n = 33)	p-value
Age	27.23 (5.82)	27.91 (6.6)	0.63
Household size	3.9 (2.72)	3.45 (1.95)	0.44
Asset index	1.83 (0.94)	1.78 (0.95)	0.83

Table 2 Multivariable linear regression assessing impact of intervention on maternal depressive symptoms, MUAC and infant feeding intention

	Maternal depressive symptoms		Middle-upper arm circumference		Infant feeding intention scale	
	Unadjusted Coeff (SE)	Adjusted Coeff (SE)	Unadjusted Coeff (SE)	Adjusted Coeff (SE)	Unadjusted Coeff (SE)	Adjusted Coeff (SE)
Treatment group	− 1.099** (− 0.492)	− 0.928* (− 0.534)	0.465 (− 0.801)	0.263 (− 0.816)	1.035 (− 0.762)	1.054 (− 0.806)
Observations	72	72	72	72	72	72

Significance: ***p < 0.01, **p < 0.05, *p < 0.1

SE standard error

Both adjusted and unadjusted coefficient estimates control for the difference in time that participants were exposed to the study

Table 3 Multivariable linear regression assessing contribution of risk factors to infant feeding intention

	Details	Infant feeding intention scale	
		Unadjusted	Adjusted
		Coeff (SE)	Coeff (SE)
Treatment group	Treatment = 1; Not own a fridge = 0	0.114	0.028
		(0.877)	(0.006)
Participant does not own a fridge	Treatment = 0; Not own a fridge = 1	− 3.559***	− 3.429***
		(− 1.216)	(− 1.430)
Treatment*Not own a fridge	Treatment = 1; Not own a fridge = 1	3.349**	2.790
		(1.611)	(1.785)
Socio-economic and demographic factors		No	Yes
Observations		72	72

Significance: ***p < 0.01, **p < 0.05, *p < 0.1

SE standard error

Both adjusted and unadjusted coefficient estimates control for the difference in time that participants were exposed to the study

counterparts (1.035 and 1.054 for the unadjusted and adjusted coefficients), but the impact was not significant.

Secondly, we analyse the impact of not owning a refrigerator as a risk factor to the intention to exclusively breastfeed (see Table 3).

Women in the control group who do not own refrigerators ("Participant does not own a fridge") scored more than 3 points lower on the breastfeeding intention scale (which ranges from 1 to 8). While the treatment has almost no effect on the infant feeding intention of women who own refrigerators (row "Treatment group"), it has a very large positive effect of roughly 3 points (3.349 and 2.79 for the unadjusted and adjusted coefficients) for women without refrigerators (row "Treatment*Not own a fridge"). This effect is significant in the unadjusted regression.

Discussion

There is little reliable evidence on the effectiveness of interventions aimed at improving maternal depression, MUAC and exclusive breastfeeding intention in LMICs. This study addresses this shortcoming by assessing the effectiveness of a package intervention, consisting of community health worker support and incentives to visit antenatal clinics, on women in a poor South African neighbourhood. We find that this intervention had a statistically significant impact on lowering maternal depressive symptoms, and on improving the exclusive breastfeeding intentions of a subgroup of women who had just given birth. This makes a meaningful contribution to this nascent literature, by building on studies testing the effectiveness of interventions to improve these health outcomes and behaviours among pregnant women in South Africa (le Roux et al., 2013; Rotheram-Borus et al., 2011, 2014, 2015; Tomlinson et al., 2015).

We find that the intervention had a negative and significant effect of 1 on a maternal depressive symptom scale that ranges from 0 to 8. This equates to a 12.5 percentage point decrease in maternal depressive symptoms. This effect is nearly half of a standard deviation of the sample variation in maternal depressive symptoms. We find that the package intervention reduces maternal depressive symptoms by as much as an increase in asset ownership that would move her from the poorest 20% to the median of the sample asset distribution. The fact that community health workers, who provide psycho-social support to pregnant women, can alleviate maternal depressive symptoms is consistent with previous studies that have identified psycho-social aspects as important risk factors for maternal depression (Akiki et al., 2016; Wittkowski et al., 2014).

We also find that the intervention had a large positive effect on exclusive breastfeeding intentions, but this effect is imprecisely estimated and hence statistically insignificant for the sample as a whole. A subgroup analysis reveals that women who reside in households without a refrigerator experience a larger increase in exclusive breastfeeding intention from the intervention than those who own a refrigerator. The effect on this intention is so large to almost entirely eliminate the substantial negative effect of not owning a refrigerator.

Our study showed that women who were in the control group and who did not have access to a refrigerator were the least likely to intend to breastfeed. This links to the literature that finds that women may opt not to breastfeed when they do not have access to refrigeration facilities because they fear contamination of their breastmilk (Balogun et al.,

2015). This result is also consistent with other studies that have found that community health worker programmes can increase exclusive breastfeeding rates (Haider et al., 2000; McInnes et al., 2000; Rotheram-Borus et al., 2014; Tylleskär et al., 2011).

We find no evidence that the intervention has either a sizeable or precisely estimated impact on MUAC. The data reveal a high degree of persistence between the baseline MUAC and the subsequent measures, and only one of the individual attributes we measure had a significant effect on the change in MUAC over the study period. These findings contribute to the paucity of rigorously tested studies on the use of conditional cash or in-kind transfers, and community-based interventions focusing on nutrition education and promotion, on maternal nutrition (Bhutta et al., 2013).

Limitations

The paper suffers from some limitations that are worth noting explicitly. First, the sample of 72 women is relatively small, and restricted to one area in the Western Cape. This precludes us from investigating the external validity of our results in other areas or contexts. Ideally, this study would be repeated on a larger sample spread across different communities to validate these results.

The intervention also effectively combined two different treatments, which means we are unable to identify separately the effects of community health worker support and incentives to visit public ANCs.

Conclusions

The study provides evidence that a package intervention, consisting of psycho-social support, additional tailored health information, and additional motivation to utilise public ANC services, can increase exclusive breastfeeding intention and reduce maternal depressive symptoms in a LMIC. Previous research has also demonstrated that the same intervention increases healthcare seeking behaviour (Rossouw et al., 2019). Although more research is needed to confirm that these findings also apply in other contexts, our results suggest that large welfare improvements for women can be achieved with relatively inexpensive interventions targeted at vulnerable communities.

Supplementary Information The online version contains supplementary material available at https://doi.org/10.1007/s10995-021-03229-w.

Author Contributions LR, RPB and RB all contributed to the study design. Implementation, fieldwork, project management and statistical analysis were performed by LR. Manuscript drafting was performed by LR, RB and RPB. All the authors read and approved the final manuscript.

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Availability of Data and Material The manuscript has associated data that is available in a data repository. https://figshare.com/s/b659902974d2fc2311bf.

Code Availability The Stata code can be uploaded to the data repository.

Declarations

Conflict of interest The authors declare that they have no conflict of interest.

Ethics Approval Ethical approval was obtained from the research ethics committee of Stellenbosch University.

Informed Consent Participation was voluntary, and all participants signed an informed consent form. All participants signed an informed consent form.

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