Research Article

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Effectiveness of the Box Savings Initiative for Transport Costs on Health Facility-Based Deliveries: A Case Study of the Franchisor-Franchisee Transport Model in Busoga Region

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ABSTRACT

Introduction: Access to maternal healthcare is crucial for reducing maternal and neonatal mortality, especially in rural areas where barriers such as transport costs limit facility-based deliveries. This study explores the effectiveness of Mothers' Box Savings Initiative on transport costs and its influence on health facility-based deliveries in the Busoga region of Uganda. Franchisor-franchisee transport model is important in building bond between mothers and local transporters. Mothers' Box Savings Initiative is a community-based saving scheme where expectant mothers save small amounts regularly to afford transportation to health facilities during delivery and when develop complications.

Methods: this was an interventional study with mixed-methods approach employed for 6 months. The franchisorfranchisee model was aimed at bringing local transporters closer to pregnant mothers. However, the Box Savings Initiative was required for mothers to afford transport costs to health centres for deliveries and treatment of maternal related complications in the Busoga region.

Results: After the initiation of box savings for transport costs affordability to health centres, deliveries in the intervention arm drastically increased to 70.5 percent and lethargically to 51.2 percent in the control arm. There was statistically significant change effect with the intervention (change average value at 0.314 and p-value at 0.000). The findings indicate that women involved in Mothers' Box Savings and can afford to meet transport costs are significantly more likely to have health facility-based deliveries (AOR=0.117; p-value=0.009; CI= 0.135 – 2.374 and AOR=2.290; p-value=0.011; CI=1.001 – 5.216 respectively).

Conclusion: This suggests that the financial empowerment provided by savings initiatives directly contributes to improved maternal health outcomes by reducing barriers to accessing skilled birth attendants. The study underscores the importance of community savings mechanisms as a cost-effective strategy for enhancing maternal healthcare accessibility in low-resource settings.

Keywords

Box Saving Initiatives, Busoga Region, Facility-Based Deliveries, Training of Mothers, Uganda.

Abbreviations

ANC: Antenatal care, CI: Confidence interval, DID: Differencein-difference, FGD: Focus group discussion, In-depth interviews, MMR: Maternal Mortality Ratio, MoH: Ministry of Health, NMR: Neonatal Mortality Rate, UBOS: Uganda Bureau of Statistics, UOR: Unadjusted Odds Ratio, AOR: Adjusted Odds Ratio, VHT: Village Health Team, WHO: World Health Organisation.

Introduction

In low-resource settings such as Uganda, access to maternal healthcare services remains a significant challenge and global health concern. One of the major barriers that women face in accessing health facility-based deliveries is the cost of transportation. Timely and safe transportation to health facilities is critical for ensuring skilled birth attendance, which is known to significantly reduce maternal and neonatal mortality.

Uganda like other sub-Saharan Africa and Southern Asia countries, has high maternal mortality ratio (MMR) of 189 per 100,000 live births and neonatal mortality rate (NMR) of 21.4 per 1,000 live births respectively [1-4]. The MMR and NMR are higher in rural areas, where mothers are poor, less educated and there is difficulty in communication and transport [5,6]. The locally available bodaboda and other means of transport is costly for mothers to reach health centres to access maternal related services.

The Ministry of Health in Uganda is working to address the challenge of transporting mothers from one health centre to another during emergencies. According to the National Emergency Medical Services (EMS) Strategic Plan 2020/21-2024/25, the goal is to increase the proportion of mothers receiving an ambulance response within one hour. In the Busoga region, there is a Regional Ambulance Hub, a regional call and dispatch centre, and a decentralized Medical Emergency Coordination Centre to enhance emergency response services. However, the contextualised and operational differences between urban and rural settings still exist. A major problem exists when it necessitates to transport mothers from rural community to a health centre as admitted by many studies [7-9], and this is a major concern for this research work. Similarly, there was an introduction of the voucher system for mothers in rural areas of Uganda to address the maternal and child health concerns [9], where boda-boda motorcycles were paid for delivering a mother or child to the health centre, and it was hugely welcomed initiative with better maternal and child outcomes. However, the study had no clear grounds of sustainability.

In response to these challenges, Mothers' Box Savings Initiative has emerged as a community-driven solution to improve transport affordability under the franchisor-franchisee transport model. This initiative involves women saving small, manageable amounts of money over time in preparation for childbirth, specifically to cover transport costs to health facilities. By empowering mothers to accumulate the funds needed for transport, this saving scheme aims to facilitate better access to healthcare services, thereby increasing the likelihood of health facility-based deliveries. The study piloted an incentive to have the mothers save 200 UGX daily from the time of them realizing that they had conceived through to their time of birth, and this had a number of outcome indicators that this paper seeks to present.

This study examines the effectiveness of the box savings initiative for transport affordability and how it influences health facilitybased deliveries in the Busoga region. Specifically to; 1) find out whether mothers saved money to pay for the local transport from community to health centres to deliver under skilled personnel; 2) establish whether mothers covered the transport costs to health centres for deliveries; and 3) establish the influence of box saving and meeting transport costs on facility-based deliveries under skilled personnel in Busoga region. Understanding the efficacy of the community savings scheme provides valuable insights into improving maternal health outcomes in rural areas where economic barriers remain pervasive.

Methods

Research Design

A non-randomized control trial study design was conducted employing both qualitative and quantitative methods. Nonrandomized trials are interventional study designs which compare a group where an intervention was performed with a group where there was no intervention [10]. The study intervention was the mothers' box savings initiative to meet transport costs which took place for a period of six months in the Busoga sub region, Uganda.

Setting

The study was carried out in the Busoga region, Uganda. Local level participants came from three districts of Bugiri, Iganga, and Bugweri where the study project was conducted. Particularly, the sub counties of intervention included Buyanga, Ibulanku, Nawandala and Budaya and no intervention included Nabitende, Nawanyingi and Makuutu in Iganga and Nabukalu in Bugiri.

Study Population

The main study population was pregnant mothers who were from Busoga region of Uganda, specifically Iganga, Bugweri and Bugiri districts, in the sub counties of Nabitende, Nambale, Nawandala and Budaya for the intervention arm, and Nawanyingi, Makuutu, Ibulanku and Nabukalu for non-intervention (control) arm.

Sample Size Selection

For respondent mothers, sample selection was derived from a total of 14,430 expectant mothers in both the intervention and control arms according to the MOH projection [11]. These are the mothers who were interviewed to explore whether box saving initiative to meet transport costs improved the utilization of health facilities for skilled deliveries.

Sample Size Determination

Based on the study by Charan and Biswas on non-randomized community trials, the sample size for mothers was estimated at 267 mothers for the intervention group and similarly 267 mothers for the control group [12]. Sample size determination is the act of choosing the number of observations or replicates to include in a statistical sample. The sample size is an important feature of any empirical study in which the goal is to make inferences about a population from a sample [13]. The population characteristics for a particular study determined the number of people selected to participate [13]. Additionally, the information the population held also determined the sample size. The more the information the population holds, the less the size of the sample [14]. This was termed as information power of the study, and it was suitable for comparison of two groups [15].

Sampling Technique

a) Pregnant mothers

Systematic random sampling was used to select mothers from the ANC registers on the day they came for ANC at the facility in each sub county for both the intervention and non-intervention arms. Mothers who were eligible and consented to participate in the study were selected from the ANC registers. Systemic random sampling is used to select a study sample from a large population at a fixed interval. The required sample size was almost half of the population of mothers in third trimester. Therefore, the research team skipped only one mother and selected the next one in the ANC register to participate in the study on consent.

b) Participants for focus group discussions

Participants in the focus group discussions were purposively selected to give additional information for the study. Focus group discussions were conducted in both the intervention and control arms. Focus group discussion members included; community leaders (LCI, administrators of boda-boda riders), mothers, husbands, boda-boda riders, VHTs and other health workers from facilities amongst others. Participants in the FGDs were organized in groups of 7–11 people for easy management.

Recruitment Process of Mothers for Box Savings Initiative Rollout

The recruitment process for mothers into the Box Savings Initiative in the Busoga region was designed to ensure inclusivity, community participation, and effectiveness in promoting transport affordability for health facility-based deliveries. The recruitment began with sensitization meetings conducted in collaboration with midwives and local community health workers to raise awareness about the initiative in the intervention arm only. These sensitisation meetings were conducted when pregnant mothers often visited health centres for ANC services.

Mothers are expected to have 4–8 visits for the whole gestation period. The study targeted mothers from 28–36 weeks of gestation (approximately 7–9 months) for the basic information. Potential participants were identified through midwives. Mothers were selected from the existing list of mothers who attended ANC on heavy clinic days. Mothers were selected based on criteria such as their pregnancy status, interest in participating, and their potential need for transport assistance during delivery. In addition, emphasis was placed on involving mothers from economically disadvantaged households to ensure that those most likely to benefit from transport affordability were prioritized. A tracking log was introduced at the health centre where particulars of the mothers were captured for easy follow up.

Mothers did not miss out on other ANC services. The services provided on the first visit include; infection screening (HIV and syphilis), nutrition advice (folic acid and other vitamins), health education on pregnancy and birth warning signs and care of the new born amongst others. Mothers who declined to participate in the study were offered the usual standard health care services as prescribed by WHO/MOH and their data was not included in the study. Once included, the mother and her baby remained in the study until the exit interview was conducted, irrespective of their child's mode or place of birth or complications.

Mothers' Basic Information on Box Savings Initiative

Once identified, the mothers were enrolled into awareness sessions where they were introduced to the "concept of savings", "financial planning", and the specific "operation of the Box Savings Initiative". Awareness sessions were designed to be interactive and practical, allowing mothers to share their financial experiences, build trust within their savings abilities, and learn effective savings strategies. The involvement of health workers in the awareness process helped to build trust in the initiative, encouraging higher participation rates.

This was conducted at health centres by either midwives or research assistants to give general information and services. Mothers recruited in the study had knowledge gaps on the box savings initiative which could hinder them from reaching health centres in time to deliver. The awareness sessions of pregnant mothers took place for about 2–3 hours at the health centres after the routine ANC services. Considering their vulnerability, mothers needed short term awareness sessions. Mothers in the third trimester visited health centres 4 times in two consecutive weeks to complete the awareness campaign before delivery. During the sessions, mothers were told about the availability of local transporters (contacts shared) and the importance of delivering from health facilities.

Franchisor-Franchisee Transport Model and the Box Savings Initiative in Busoga

Governments (local governments inclusive) are looking for ways to increase the access to desired quality of health care services in low-income and middle-income countries. One system that is not connected to the public sector has been to provide health services through a franchisor-franchisee transport model, called social franchising. The concept of franchising for health services is similar to franchises in business. Figure 1 demonstrates franchisorfranchisee transport model.

Franchisor - Franchisee Transport Model



Figure 1: Franchisor-Franchisee Transport Model for transportation of mothers to health centres by locally available transporters.

Franchising is defined as a system of marketing goods and/ or services and/or technology, which is based upon a close and ongoing collaboration between legally, and financially separate and independent undertakings of the franchisor and its individual franchisees [16]. Simply, it is defined as authorization granted by a government or project to an individual or a group to enable them to carry out specified commercial activities. In a business context, the franchisor is a central organization such as a nonprofit organization, a local government body, or a microfinance institution that develops the concept of the Box Savings Initiative for example, including the structure, financial management, best practices, and training materials amongst others. The franchisee represents local community institutions (local commercial transporters in this case) who take up the initiative at the grassroots level, delivering the program directly to expectant mothers for the case of this study. In the health contest, the commercial activity or concept was "transporting of mothers to health centres" at an affordable cost (Box Savings Initiative) by local commercial transporters.

The Franchisor-Franchisee Model, entitles and compels the individual franchisee, in exchange for a direct or indirect financial consideration, to use the franchisor's trade name, and/or trade mark and/or service mark, know-how, business and technical methods, procedural system, and other industrial and/or intellectual property rights [17]. In this case, the model was "Transport Affordability" and the reason for box savings initiative, and considered as the trade name or trade mark used for the study. The intention was to enable mothers use the locally available transport services to health centres to deliver under skilled personnel at a subsidized and affordable cost to reduce on the maternal and neonatal mortality rates.

In the box savings initiative, mothers save money in the boxes and broke them when going to health facilities to deliver or when developed a complication. Saving money is usually a tedious task that requires a high degree of self-control for many of the mothers [17]. There is hope and early work reports that social franchising may quickly spread health services in low and middleincome countries to improve the health of mothers. The franchisorfranchisee transport affordability model can be effectively utilized to scale the Box Savings Initiative in the Busoga region, improving transport services for health facility-based deliveries. But this Cochrane review of 2018 did not also find any rigorous evidence to demonstrate the effect of social granting on access to and quality of care in low and middle-income countries [18]. The study had to find out the essence of box savings to meet transport costs on deliveries in health facility settings.

By operating locally, franchisees understand the unique challenges faced by pregnant mothers and can adapt aspects of the initiative to better fit local conditions, while still adhering to the general principles set by the franchisor. This transport model allows for the sustainable and scalable expansion of the Box Savings Initiative, as it combines the benefits of centralized quality control with the flexibility of local adaptation. In this transport model, the franchisor also provides technical support and monitoring to ensure the success of the franchisees, which helps build trust among mothers regarding the safety and reliability of their savings. By replicating the initiative across different pregnant mothers in different health centres through the franchiser-franchisee transport model, the reach of the Box Savings Initiative can be expanded efficiently, thus helping more women afford transportation for health facilitybased deliveries. This strategy not only promotes increased access to maternal healthcare but also encourages local leadership and empowerment, contributing to the sustainability of maternal health interventions in Busoga region and the country at large.

Research Instruments

Making a choice among the different data collecting tools involves considering their appropriateness and relative strengths and weaknesses [19]. In this study, combinations of tools were used, that is, questionnaires and interview guide.

A questionnaire is a set of written questions stemming from the objectives of the study and literature review which is developed by the researcher and administered to a selected group of respondents [19]. It is more preferable especially when dealing with respondents who do not offer time for interview and are very free and open when it comes to putting their views on paper. Questionnaires were administered to the consenting respondents (mothers) at the health facilities. Questionnaires were filled by the research assistants for respondents who did not know how to read and write. The questionnaire was also translated into the local language used in the study area for easy comprehension and convenience of the respondents who preferred the translated version of the tool.

An interview guide is simply a list of high-level topics with formulated questions that are planned to be covered during an interview with participants [20]. It can be used in the Key Informant Interviews (KII), In-Depth Interviews (IDI) and Focus Group Discussions (FGDs) or community dialogues. This qualitative data collection tool was used in this study to ease the verbal interaction with interviewees as guided by the researcher. Responses were duly recorded and notes taken during the interviews. A checklist was a tool designed to capture information extracted from the health unit outpatient monthly report (HMIS 105) and management information system [21]. Data filled in HMIS 105 was extracted from the already existing registers in health centres and later entered in MIS at the district head offices. Registers are simply defined as primary tools in which health information is recorded and can be retrieved [22]. These provided secondary data in most cases which enriched the study with information deemed necessary.

Data Analysis

Data analysis was computed using STATA *version* 14 for the quantitative data. Tests of independence were used to determine the statistical significance of different variables. The *p*-value set at 0.05 was used to determine the statistical significance of the associations between independent and dependent variables at 95 percent confidence intervals (CI).

Logistic regression model was used to ascertain the statistical relationship between independent variables and maternal outcome (health facility-based deliveries). It derived regression odds ratios and p-values which were used to determine which variables impacted on the topic of study. Furthermore, multiple logistic regression of independent variables which were statistically significant, were considered to confirm whether they were the predictors of the maternal outcome.

Effect of intervention (awareness sessions of mothers on the transport model and box savings initiative) was determined using difference-in-difference (DID) model. The DID model is defined as the difference in average outcome in the intervention group before and after intervention minus the difference in average outcome in the control group before and after intervention (Wing, Simon & Bello-Gomez, 2018).

Atlas Ti *version* 7 was used for qualitative analysis. It involved rereading the interview transcripts to identify themes and sub themes that emerged from the respondents' answers during the FGDs. The arrangement for analysis was based on the topics and questions formulated for the interviews in order to synthesize the answers to the proposed questions.

Ethical Considerations

Ethical approval to conduct the study was provided by the Institutional Review Boards (IRB) of Uganda Martyrs University - Nsambya hospital (UG-REC-020) as well as Uganda National Council for Science and Technology (UNCST), under number (SS 4813). Voluntary written informed consent was then individually obtained from all the study participants and authorities in the study area. The respondents consented to participate in the study and were assured of their right to withdraw from the interview at their will.

Results

Socio-demographic characteristics of mothers

Is this study, majority of respondents were below 34 years. The

income levels for the mother was important for the affordability of transport costs. Unfortunately, in both arms, majority of the mothers in Busoga region are low income earners (64.6% and 59.4% for the intervention and control arms respectively). Almost all mothers in both the intervention and control arms were married (97.6% married in the intervention and 98.8% in the control) and above 85% stay in rural settings. This is important for mothers in benefiting from the support of husbands.

Preferably, mothers could walk if the distance was short between the health centres and households. In the intervention arm, 38.8%of the mothers had a distance of 5 - 6 kilometres to the health centres and 34.8% in the control arm. According to results, the distance between their homes and health centres was said to be 3-4 kilometres (40.6% in the intervention arm and 37.6% in the control arm). There were also mothers for the distance between 1 and 2 kilometres in the intervention and control arms (17.8%and 20.8% respectively). These are not walkable distances for a pregnant woman. It required them to use any means of transport to the health centre. The means of transport used mostly in both arms was motorcycle (70.5% for the intervention arm and 51.2%control arm respectively). See Table 1.

 Table 1: Socio-demographic characteristics of mothers in the intervention and control arms.

Variable		Measure	Intervention	Control	
			N= 255 (%)	N=248 (%)	
1.	Age	≤15 – 24	88 (34.6)	100 (40.6)	
		25 - 34	88 (34.6)	78 (31.3)	
		35 - 44	58 (22.5)	36 (14.5)	
		45 and above	21 (8.3)	34 (13.6)	
2.	Level of income	Low	165 (64.6)	147 (59.4)	
		Middle	80 (31.3)	84 (33.8)	
		High	10 (4.1)	17 (6.8)	
3.	Marital status	Not married	0 (0.0)	0 (0.0)	
		Married	249 (97.6)	245 (98.8)	
		Divorced	6 (2.4)	3 (1.2)	
4.	Means of transport used	Vehicle	7 (2.5)	19 (7.7)	
		Motor cycle	180 (70.5)	127 (51.2)	
		Bicycle	38 (15)	53 (21.4)	
		Walk	30 (12)	49 (19.7)	
5.	Average distance to HC	1-2	46 (17.8)	53 (20.8)	
		3-4	104 (40.6)	93 (37.6)	
		5-6	99 (38.8)	86 (34.8)	
		7-8+	7 (2.8)	16 (6.8)	
6	Area of residence	Rural	231 (90.6)	212 (85.3)	
0.		Urban	24 (9.4)	36 (14.7)	

Source: Primary Data, 2019.

Maternal outcome (Health Facility-Based Deliveries)

Health facility-based deliveries at baseline as extracted from the maternity register and HMIS report (105) were 33.4 percent in the intervention arm and 48.4 percent in the control arm. After the initiation of box savings for transport costs affordability to health centres, deliveries in the intervention arm drastically increased to

70.5 percent and lethargically to 51.2 percent in the control arm as shown in Figure 2. There was statistically significant change effect with the intervention (*change average value* at 0.314 and *p-value* at 0.000).



Figure 2: Deliveries by skilled personnel at health centres.

Box Savings by mothers and transport cost coverage for deliveries at health centres

Before the start of the awareness of box savings initiative and the franchisor-franchisee transport model, mothers were given research questionnaire to answer the questions after consenting. When mothers gave birth, they were given the same questionnaire to answer.

Results in Table 2 revealed that 65.1% of mothers in the pre intervention phase in the intervention arm agreed to save money for transport fares. In the control arm, only 18.7% of the mothers thought of saving money for transport fares. It was completely different in the post intervention phase; 92.2% of mothers agreed to save money for transport fares in the intervention arm and only 22.5% in the control arm. Similarly, the average value for the acceptability of the box savings initiative by mothers was 0.233 and the change effect with the intervention was statistically significant (*p*-value=0.005).

Having saved money for transport, at the baseline of the study, only 56.3% of the mothers in the intervention arm afforded transport costs to health centres to deliver and when they had complications and only 53.2% of mothers in the control arm. In the post intervention phase, 89.5% of mothers were able to clear transport costs in the intervention arm and only 49.7% in the control arm. The average value of the change effect on the affordability of transport costs to health centres by mothers was 0.367, and was

statistically significant (*p*-value=0.012). see Table 2.

Despite of many mothers saving money in the savings boxes, not all of them were able to meet transport costs to health centres to deliver and when they had other complications. According to results of pre and post intervention in the intervention arm, 56.3% from 65.1% and 89.5% from 92.2% mothers respectively saved money but did not meet transport costs. In the control arm, very few saved money in the savings boxes and hardly reached 50% of mothers who paid for their transport to health centres as reflected in Table 2.

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Influence of Box Savings Initiative and Transport Cost on Facility-Based Deliveries

Health facility deliveries are expected to improve as a result of box saving initiative by mothers after the awareness creation through short sessions. From the results in Table 3, mothers in the intervention arm were 1.043 times more likely to deliver from a health centre compared to those in the control arm and had a statistically significant influence (UOR=1.043; p-value=0.031; CI=0.122-2.921).

There were mixed responses on the box savings initiative which encouraged mothers to save money in saving boxes. Mothers were encouraged to save money for transport and other supplies. Mothers who saved money in the savings boxes, were 7.290 times more likely to deliver from health centres compared to those who did not save and had a statistically significant influence (UOR=7.290; p-value=0.005; CI=3.624-16.013).

"...When mothers save money in the boxes, it is good for both of us. That is what they use to pay us. Since riders will be expecting their pay, they will easily run to these mothers when contacted for transport to health centres."

Table 2: Box Savings by mothers and transport cost coverage to health centres.

Thomatio	Questions		Interv. arm	Control arm	DID	P-value
Thematic areas			Pre % (Post %)	Pre % (Post %)	עוע	
Day agyings initiative	Have you been able to save money in the savings	Yes	65.1% (92.2%)	18.7% (22.5%)	0.267	0.012
Box savings initiative	box for transport fare to HCs?		34.9% (7.8%)	81.3% (77.5%)	0.307	0.012
Transport cost coverage	Have you been able to meet your transport costs		56.3% (89.5%)	53.2% (49.7%)		
to health centres	from community to health centre when in labour or with other complications?	No	43.7% (10.5%)	46.8% (50.3%)	0.233	0.005

DID – Difference in difference.

One of the Boda-boda riders (respondent 40, 2019) affirmed during a FGD in the intervention arm.

Mothers could afford the transport cost coverage to health centres. According to results in table 3, transport cost coverage to health centres had a significant influence on deliveries at health centres. Pregnant mothers who afforded transport costs were 2.814 times more likely to deliver from a health centre compared to those who could not afford (UOR=2.814; p-value=0.040; CI=1.561-5.099). In a FGD, a mother (respondent 42, 2019) in the intervention arm, she commended affording to pay boda-boda riders;

"...Boda-boda riders are the locally available means of transport to health centres in time. Thank you for coming up with an idea of saving money in the wooden boxes, it has united mothers and boda-boda riders. One of these days they (boda-boda riders) treat us fairly and they care. They are very sure that we can afford to pay them."

Mothers have come to appreciate local boda-boda riders because of the change in their behaviours. This has been attributed to their being sure with the availability of the money for the transport fare. This clearly came out during FGD when one of the mothers (respondent 32, 2019), said;

"...Thank you for the short training. I did not take it serious that local boda-boda riders are very important in transporting mothers to health centres and saving their lives. We have even started saving money to pay them, it is giving me much energy. This is a rural village with mothers who need to be helped. I can say I will continue saving money in the box such that I can afford the transport cost to the health centre."

Using a multiple regression analysis, Table 3 presents the adjusted estimates of the variables that were significant at bivariate level to determine the predictors of facility-based deliveries. There was strong significant influence of box savings initiative on health facility-based deliveries. By implication, pregnant mothers were 1.352 times more likely to deliver from health centres (AOR=1.352; p=0.045; CI= (0.591, 3.042) as a result of box savings initiative awareness in the intervention arm. Mothers saving money in the saving boxes and transport cost affordability remained statistically

significant and as predictors of health facility-based deliveries in Busoga sub region (AOR=0.117; p-value=0.009; CI=0.135-2.374 and AOR=2.290; p-value=0.011; CI=1.001 - 5.216 respectively).

Discussion

The findings of this study reveal that the Box Savings Initiative significantly impacts health facility-based deliveries by addressing a key barrier; the cost of transportation. Transportation expenses often prevent expectant mothers from reaching healthcare facilities, resulting into home deliveries or delays in seeking medical care, which increases the risk of maternal and perinatal mortality. Many studies have expressed the difficulty mothers experience when time to move from community to health centres [7-9]. Mothers had experienced the burden of paying for transport, communicating to the riders, buying supplies and other requirements for themselves, and their newborn babies as household members [23]. Few women can afford to fund themselves. Therefore, enabling women to save incrementally and access these savings for transport costs, the initiative helps ensure timely access to health facilities during labor. It has been found out that some mothers who can afford to save the little for transport purposes divert the money to cater for domestic needs like food, school fees, and general welfare [23]. It was not exceptional with this study, not all mothers who saved money in boxes paid for transport to health centres.

The integration of the Franchisor-Franchisee transport model in Busoga Region further strengthens the success of this initiative. This model ensures that the local transporters (franchisees) are supported through guidance and oversight from the managing organization / lower local governments or research investigator based at health centres, with the intentions of uniting mothers and local transporters to improve maternal indicators. The partnerships formed between health facility-based research team and local transporter will encourage pregnant women to use the available maternal health services. Like one of the studies [17,16], the transport model entitles and compels the individual franchisee, in exchange for a direct or indirect financial consideration, and uses the franchisor's trade name, and/or trade mark and/or service mark, know-how, business and technical methods, procedural system, and other industrial and/or intellectual property rights. Here local transporters were guided by the research team to subsidize costs of transport for mothers to reach health centres in time to deliver or

	Questions	UOR (95% CI)	P-value	AOR (95% CI)	P-value	
Thematic areas	Control	1		1		
	Intervention	1.043 (0.122, 2.921)	0.031	1.352 (0.591, 3.042)	0.045	
	Have you been able to save money in the savings box for transport fare to HCs?					
Box saving initiative	No	1		1		
	Yes	2.814 (1.561, 5.099)	0.040	0.117 (0.135, 2.374)	0.009	
	Have you been able to meet your transport costs from community to health centre when in labour or with other complications?					
to health centres	No	1		1		
to nearm centres	Yes	7.290 (3.624, 16.013)	0.005	2.290 (1.001, 5.216)	0.011	

 Table 3: Box saving initiative and transport cost predictors of facility-based deliveries.

UOR: Unadjusted Odd Ratio and AOR: Adjusted Odd Ratio.

treated of other complications. It worked in Busoga region, unlike other studies in the low and middle income countries [18].

Moreover, the affordability of transport through the local transporters helps reduce the financial strain on households, particularly in low-income areas where transportation costs might otherwise be prohibitive. Mothers with access to box savings are more likely to opt for health facility deliveries, knowing they can afford transport at the critical moment of labour onset and other health related complications. This effect aligns with broader efforts to reduce the three delays, particularly the first delay (decision to seek care) and the second delay (reaching care), as the initiative mitigates both the financial and logistical barriers to timely health facility-based deliveries. One of the studies conducted, provided motorcycle ambulances to mothers as means of transport to health centres in Mbale district, eastern Uganda [9]. This intervention was not sustainable. Ministry of health also has the National Emergency Medical Services for mothers to receive ambulance services within one hour [24]. The ministry intervention is working well in urban setting and ambulances given out are not enough. But, the box savings initiative has been tested to be fit for rural setting. Mothers in the rural community are capable of meeting the transport costs with clear interventions [5,6]. Therefore, box savings initiative was timely and appropriate for the rural setting and Busoga region in particular.

It was also noted that the initiative fostered greater community participation and awareness regarding maternal health. It is an implication that there was good learning as affirmed by the theory of learning and teaching [25,26]. The learning and collective nature of the savings system empowered women, not only providing a financial safety net but also facilitating social support networks that encouraged antenatal care visits and deliveries at health facilities and the treatment of pregnancy related complications.

However, challenges remain, particularly around scaling the initiative across larger regions or to more remote areas. Spreading the box savings information is key but some studies observed that it is quite challenging and it requires different stakeholders including mothers to spread maternal related information [27]. The sustainability of the model also requires further exploration, particularly in terms of how long-term savings behaviour can be maintained and whether other financial barriers, beyond transport, such as healthcare costs, can be addressed through similar initiatives.

Conclusion

The Box Savings Initiative for transport costs in the Busoga Region is an effective strategy to increase health facility-based deliveries. The combination of collective savings and the franchisor-franchisee model improves maternal access to necessary health services by making transport more affordable and accessible. This approach addresses key barriers associated with the first and second delays in the Three Delays Model, contributing to safer deliveries and improved maternal health outcomes.

avenues for financial support, such as healthcare costs. Continuous local community engagement and support are also essential to maintain participation and trust in the system. Ultimately, by addressing transportation costs, the Box Savings Initiative contributes to a broader effort to reduce maternal and perinatal mortality in rural and low-income communities. other efforts Acknowledgements

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To enhance the initiative's impact, stakeholders should consider

expanding the program to other regions and exploring additional

References

- 1. UBOS and ICF. Uganda Demographic and Health Survey 2022, Kampala, Uganda. 2023.
- Blencowe H, Kancherla V, Moorthie S, et al. Estimates of global and regional prevalence of neural tube defects for 2015: a systematic analysis. Annals of the New York Academy of Sciences. 2018; 1414.
- 3. Hug L, You D, Blencowe H, et al. Global, regional, and national estimates and trends in stillbirths from 2000 to 2019: a systematic assessment. The Lancet. 2021; 398.
- 4. Saleem S, Tikmani SS, McClure EM, et al. Trends and determinants of stillbirth in developing countries: results from the Global Network's Population-Based Birth Registry. Reproductive health. 2018; 15.
- 5. Munjanja SP. Geographical Access, Transport and Referral Systems. Harare, Zimbabwe. 2012.
- Yanagisawa S, Soyano A, Igarashi H, et al. Effect of a maternal and child health handbook on maternal knowledge and behaviour: a community-based controlled trial in rural Cambodia. Health Policy and Planning. 2015; 30: 1184-1192.
- Program for Appropriate Technology in Health [PATH]. Referral Communication. Technology Opportunity Assessment Prepared for the Merck for Mothers Program. 2013. <u>http://sites.path.org/mnhtech/files/2013/07/Referralcommunication_2</u>
- 8. Pembe AB. Effectiveness of maternal referral system in a rural setting: a case study from Rufiji district, Tanzania. BMC Health Serv Resv. 2013; 10.
- 9. Ssebunya R, Matovu JKB. Factors associated with utilization of motorcycle ambulances by pregnant women in rural eastern Uganda: a cross-sectional study. 2016.
- 10. Thiese MS. Lessons in Biostatistics. Observational and interventional study design types; an overview. Rocky Mountain Center for Occupational and Environmental Health, University of Utah, Salt Lake City, Utah, USA. 2014.
- 11. MOH. Population projection of expectant mothers in the east central districts of Iganga and Bugiri. (Un-published). 2018.

- Charan J, Biswas T. How to Calculate Sample Size for Different Study Designs in Medical Research? Indian Journal of Psychological Medicine. 2013; 35: 121-126.
- 13. Mack N, Woodsong C, MacQueen KM, et al. Qualitative research methods: a data collector's field guide, Family Health International, North Carolina. 2005.
- O'Reilly MP. Unsatisfactory saturation: A critical exploration of the notion of saturated sample sizes in qualitative research. Qualitative Research. SAGE Journals. 2013; 13: 190-197.
- 15. Singh JK, Kadel R, Acharya D, et al. 'MATRI-SUMAN' a capacity building and text messaging intervention to enhance maternal and child health service utilization among pregnant women from rural Nepal: study protocol for a cluster randomized controlled trial. BMC Health Serv Res. 2018; 18: 447.
- 16. Koehlmoos TP. The effect of social franchising on access to and quality of health services in low- and middle-income countries. Cochrane Database of Systematic Reviews. 2009.
- 17. Seitz T, Koelle M, Lindemann P, et al. Smart Piggy: A Piggy Bank that talks to your Smartphone. University of Passau Innstraße 43 (ITZ) Passau, Germany. 2013.
- Chen H, Chai Y, Dong L, et al. Effectiveness and Appropriateness of mHealth Interventions for Maternal and Child Health: Systematic Review. JMIR Health and Health. 2018; 6: e7.
- Clifton KJ, Handy SL. "Qualitative Methods in Travel Behaviour Research", Jones, P. and Stopher, P.R. (Ed.) Transport Survey Quality and Innovation. 2003; 283-302.

- 20. Ryan F, Michael C, Patricia C. Interviewing in qualitative research. International Journal of Therapy and Rehabilitation. 2009; 16: 309-314.
- 21. Health Management Information System (HMIS). Health Management Information System for districts in Busoga region. 2018.
- Gliklich RE, Dreyer NA, Leavy MB. Registries for Evaluating Patient Outcomes, 3rd edition. A User's Guide. Rockville (MD): Agency for Healthcare Research and Quality (US); Report No. 2014; 13: EHC111.
- 23. Namazzi G, Okuga M, Tetui M, et al. Working with community health workers to improve maternal and newborn health outcomes: implementation and scale-up lessons from eastern Uganda. Global Health Act. 2017.
- 24. MOH. Uganda Health Systems Strengthening Project. 2017. https://www.newvision.co.ug/digital_assets/8455133e-589b-4292-8c0d-a16bd9de7c26/Uganda-Health-Systems-Strengthening-Project-B.pdf
- 25. Mugisha JF. Improving Continuing Professional Development for Health Workers: Is Learning Theory Relevant? The American Journal of Innovative Research and Applied Sciences. 2015; 1: 85-93.
- 26. Kaya Z. Learning and Teaching: Theories, Approaches and Models. 2016.
- Patel S, Awoonor-Williams JK, Asuru R, et al. Benefits and Limitations of a Community-Engaged Emergency Referral System in a Remote, Impoverished Setting of Northern Ghana. Global health. science and practice. 2016; 4: 552-567.

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