Effect of a Community Based Social Marketing Strategy on the Uptake of Clean Delivery Kits in Peri-Urban Communities of Karachi, Pakistan

Asra Usmani

Aga Khan University Hospital

Shazia Sultana

Aga Khan University Hospital

Imran Nisar (✉ imran.nisar@aku.edu)

Aga Khan University Hospital

Shehla Zaidi

Aga Khan University Hospital

Imtiaz Jehan

Aga Khan University Hospital

Anita Zaidi

Aga Khan University Hospital

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Abstract

Background: Neonatal and maternal mortality is high in Pakistan. More than half of all deliveries take place at homes by unskilled birth attendants and unhygienic practices are common. The objective of our study was to determine the effect of a community based strategy of social marketing promoting clean delivery kits on the uptake of clean delivery kits for use in home deliveries in peri-urban communities of Karachi, Pakistan.

Methods: Following a baseline survey of women who delivered in previous three months as a reference group, end line survey was conducted of women who delivered post intervention to assess need, use and availability of clean delivery kits. Availability of these kits was ensured at accessible stores in these communities. Quantitative component comprised of the baseline and post intervention surveys while qualitative information was sought from focus group discussions. Binary logistic regression was used to analyze quantitative data and ground theory to analyze qualitative data.

Results: 603 women were surveyed in the baseline survey and 568 women in the end-line survey. The proportion of women using CDKs in home deliveries increased from 9.3% in the baseline survey to 23.8% ($p < 0.05$) after the social marketing intervention in the end-line survey. 40% of women reported non-use of kits due to inability to pay for it. However, focus group discussions revealed that many women thought that the kits should be free or should be included in the amount charged by birth attendants. After adjusting for other variables, age of the woman and education of the husband were found significantly associated with use of clean delivery kits in home deliveries.

Conclusions: Social marketing strategy targeting pregnant women and their family members can play a significant role in improving use of clean delivery kits in home deliveries. However, many women expect that the cost of the kit to be included in charges paid to birth attendants. A combined approach targeting both pregnant women as well as traditional birth attendants may improve clean delivery kit use to higher levels and be sustainable in the long-run.

Introduction:

Around 295 000 women die every year globally during and following pregnancy and childbirth with most of these deaths (94%) occurring in low-resource settings and South Asia accounting for nearly one-fifth of all deaths (1). At the same time 2.4 million children die annually in the first month of life (2).

Pakistan has one of the highest MMR and NMR in the region, with a MMR of 140 per 100,000 live births and a NMR of 41 per 1000 live births (3, 4). Although Pakistan is a signatory to the UN's SDGs which sets to reduce MMR to less than 70 per 100 000 births and neonatal mortality to at least 12 per 1,000 live births by 2030, it is unlikely to meet both targets (5).

Most of the maternal deaths occur during labor or in the first 24 hours postpartum while neonatal deaths are concentrated in the first week of life (6)(7)(8). This period also provides a window of opportunity to

systematically address the causes leading to increased mortality and morbidity. Several interventions have been shown to be effective in causing significant reductions to maternal and neonatal mortality. These include increasing ANC coverage, birth preparedness, delivery in a health facility in the presence of a skilled birth attendant and adequate care in the post-natal period. Moreover, these work in a highly synergistic fashion when implemented together in packages (9).

One of the interventions that has been tested widely is uptake of CDKs (10, 11). These are simple, disposable kits, which consist of soap for cleaning hands and perineum, a plastic sheet to provide a clean delivery surface for birth, a new razor blade for cord cutting and clean cord ties packaged in a box with illustrated instruction for its contents usage with an affordable cost, to be used by a birth attendant (12). In a cluster randomized controlled trial done in 2000 in rural Pakistan, use of CDKs decreased perinatal mortality by (13). Adaptation has been slow with coverage of CDKs standing at only 31.4% in 2006–2007 (14). This indicates that despite evidence of efficacy the real-world benefits are not being actualized.

Multiple strategies and approaches have been used to increase the uptake of beneficial health interventions in the community. Social marketing strategies have been used successfully to increase uptake of modern contraceptives and other health behavioral interventions (15, 16). Social marketing is defined as “the use of marketing to design and implement programs to promote socially beneficial behavior change” (17).

In this study we aimed to determine the effect of a community based social marketing strategy, comprising of two home visits by CHWs to pregnant women in the last trimester, on the uptake of safe delivery kits for use in home deliveries, in peri-urban communities of Karachi, Pakistan. In addition, we explore factors constraining or facilitating the uptake of these kits.

Methodology:

Study setting: This study was conducted from October 2009 to March 2010 in four peri-urban communities in Karachi, Pakistan (18). These areas include coastal fishing villages and semi urban settlements within the city. The total population of these three settlements was 212,294.

Study design: This was a mixed method study with a qualitative and a quantitative component. The quantitative arm consisted of two cross sectional surveys conducted at baseline and towards the end of the study period after the implementation of the intervention. The qualitative component consisted of 6 FGDs, 2 each with women who bought CDKs and used in their home deliveries, women who did not buy CDKs and birth attendants.

Study population: All women who delivered in last three months and residing in the catchment area and providing written informed consent were eligible to be part of the baseline survey. The intervention cohort consisted of a random subset of women who were at least 24 weeks pregnant at the start of the study

and planned to deliver within the catchment area. Uptake of CDKs was measured at the end of the study period.

Intervention: The first step in the intervention consisted of making the pre-assembled, CDKs available at convenient and accessible spots in the community. These mostly consisted of the local *Kiryanas* (General Stores). CHWs subsequently visited enrolled women thrice in the third trimester. First visit was done to confirm address, gestational age and take consent. This was followed by two additional visits which entailed discussions with the woman and other decision makers of the family to provide information and education regarding use of CDKs. The time and date of sessions were scheduled as per the participants' convenience. The visits included discussion on: the kit, its contents, availability at the nearest *kiriyana*, method to use it, price and cost effectiveness in preventing both maternal and newborn complications. Visual illustrations were used for explaining many of the concepts.

Data collection:

For the quantitative component, questionnaires were administered at home by CHWs both for the baseline survey and for the intervention cohort immediately after birth. Both tools had questions on sociodemographic characteristics, past medical and obstetric history of the mother, use of CDKs and information on events around the peri-partum period. Specific questions were asked about the place of delivery, person assisting the delivery and key decision makers in the family for seeking care during and after pregnancy. If CDKs were used, women were asked about the items that were most used. If CDKs were not used, mothers were inquired about the reasons for not using them.

A total of 6 focus group discussions were planned. Two were conducted with mothers in the intervention arm who used the CDK, two with mothers in the intervention arm who did not use the CDK and two FGDs were conducted with the birth attendants. Each FGD had around 5–7 participants and was conducted by the principal investigator herself along with a sociologist. Audio recording were done, and detailed notes were taken.

Data management: All survey data were double entered by two independent data entry operators using a customized data entry program developed using Epi info version 6.04 (CDC, USA) with consistency checks built in. A validation check comparing the two data sets was run and any discrepancies were resolved.

Sample size: Assuming a baseline uptake of CDKs to be 10%, 65% deliveries taking place at home, a 15% absolute increase in proportion of women using the kits enrolled in the study and delivering at home, setting power at 90% and alpha as 0.05 and inflating for 15% lost to follow up, we calculated a sample size of at least 600 in each survey.

Plan of analysis:

Plan of analysis: We compared baseline sociodemographic characteristics of the reference and the intervention group and change in uptake of the CDKs with the intervention. Within the intervention group,

we identified factors that were associated with uptake of the CDK by using logistic regression between the two groups. All variables which had a p-value of less than 0.10 at univariate level were used to construct a multivariable regression model using backward elimination technique. Odds ratios with 95% confidence intervals are reported. Hosmer and Lemeshow test was used to assess the final fit of the model. All analysis was done using SPSS version 16.

Data triangulation was done between quantitative and qualitative components to cross verify results and output from more than one source and to increase the credibility and validity of the data (19).

Ethical consideration: Ethical approval was obtained from Aga Khan University's Ethical Review Committee. A written informed consent was obtained from all participants

Results:

For the baseline survey, 603 women who had given birth in the previous 3 months were randomly selected from the available line listing. For the intervention group 600 women in the third trimester were randomly selected from the available line listing. Outcome information was available for 568 (94.7%) women in the intervention arm. Both groups were similar in terms of mean age, formal education of the woman /husband. Mean parity of women in reference group was 3.7 ± 2.5 as compared to 2.8 ± 1.9 in the intervention group (Table 1). In the reference group 382 (63.6%) women delivered at home while in the intervention group 371 (65.4%) delivered at home. Of these 9.3% in the baseline and 23.8% in the social marketing intervention group used CDKs (Table 2).

Table 1
Socio demographic characteristics of study subjects

	REFERENCE GROUP n = 603	INTERVENTION GROUP n = 568
Age of woman in years (mean $\pm$ SD)	27.5 $\pm$ 5.4	26.8 $\pm$ 5.1
Parity (mean $\pm$ SD)	n = 603 3.7 $\pm$ 2.5	n = 566 2.8 $\pm$ 2
Woman's education status	n = 603	n = 568
Uneducated	478 (79.2%)	426 (75.0%)
Primary	93 (13.8%)	95 (16.7%)
Matric or more	42 (6.9%)	47 (8.3%)
Woman's occupation	n = 601	n = 568
Home maker	586 (97.5%)	563 (99.1%)
Husband's education status	n = 601	n = 568
Uneducated	404 (67.2%)	380 (67.2%)
Primary	108 (18.0%)	111 (19.5%)
Matric or more	91 (15.1%)	77 (13.5%)
Husband's occupation	n = 601	n = 568
Fisherman	281 (46.6%)	288 (50.7%)
Shopkeeper	98 (16.3%)	62 (10.9%)
Vendor	61 (10.1%)	43 (7.6%)
Hospital worker	46 (7.6%)	2 (0.4%)
Unemployed	17 (2.8%)	12 (2.1%)

Table 2
-Home deliveries and use of clean delivery kits in the reference and intervention group

	Reference Group n = 603 n (%)	Intervention group n = 568 n (%)
Place of Birth	n = 603	n = 567
Home	382 (63.6%)	371 (65.4%)
Health facility	221 (36.7%)	196 (34.6%)
Clean delivery kits used at home delivery	n = 381	n = 370
Yes	36 (9.4%)	88 (23.8%)
Kits bought for use	n = 36	n = 88
Bought	25 (69.4%)	87 (98.9%)
Reason for not using the CDK	n = 345	
Never heard of it	310 (89.9%)	-
Did not know where available	20 (5.8%)	-
Birth attendant did not suggest	7 (2.0%)	-
Lack of money	5 (1.4%)	-
Did not like	3 (0.9%)	-
Use of items of kit used during home deliveries		n = 87, n (%)
Plastic sheet	-	73 (83.3%)
Soap	-	73(93.1%)
Blade	-	85 (97.7%)
Thread	-	81(86.2%)
Glove	-	58 (66.7%)
Gauze	-	81(93.1%)
Had you bought if known	n = 343	
Yes	286 (83.3%)	-

Nearly 40% of those who did not use CDK in the intervention group, cited inability to pay as the top most reason while 25% thought that it was not important (data not shown). Focus group discussions further

revealed that many women thought that they expected kits to be free or to be included in the amount charged by birth attendants. More than half of the women reported mother-in-law as the key decision maker in the choice to use CDK.

In the multivariable regression model, age of the woman and education of the husband were found to be significantly associated with use of CDKs (Table 3).

Table 3
Logistic regression model for uptake of clean delivery kits in home deliveries

Variables	Univariate analysis	Multivariate analysis
	OR(95 % CI)	OR(95 % CI)
Age of women	1.1 (1.05, 1.17)	1.1 (1.05,1.2)
Parity	1.2 (1.0,1.4)	-
Respondent's education	2.16 (1.28, 3.6)	
Husband's education	2.2 (1.3,3.6)	2.2 (1.3,3.6)
Husband's occupation		
Other	1.0 (Ref)	-
Factory worker	3.7 (2.2,6.3)	-
Fisherman	0.48 (0.2,0.6)	-
Previous use of clean delivery kit	2.1 (0.8,5.5)	-

Focused group discussions:

Six FGDs yielded a wealth of information, some of the most important areas and their associated sub-themes, are summarized below and in Table 4.

Table 4
Focus group themes and sub themes

Research question	Sub themes
Reasons underlying non-use of the clean delivery kits	Lack of trust in new products
	Need to pay separate charge of kit
	Reluctance to adapt new practice due to no previous difficulty without CDK
Reasons underlying usage	Effective way of spreading information and creating awareness regarding clean delivery kits
	Ease of storage as clean delivery kits had all useful items in a single packet
	Clean delivery kit was available at accessible stores and at affordable price
Response of birth attendants	No objection from birth attendants towards the clean delivery kits
	Inconsistent promotion of kits has been a problem for the birth attendants previously

FGDs with mothers who did not use CDKs:

Most of the women cited lack of trust in a new product as a main reason for not using CDKs. They were cynical about the strategies applied to promote the kits. One particular woman said

"We are illiterate; we have been fooled by many marketing campaigns, now we avoid new products." (ID.3 FGD 1)

Another main reason included additional cost associated with purchasing a CDK and a perceived low risk of any complication with not using a CDK. They also mentioned that the money could instead be used for arranging a one-time meal for the family.

"We don't have a regular source of income; we could have bought the kit. If we had money, we could have even gone for hospital delivery but at that time we literally had no money."(ID 1 FGD 2)

Some women cited their previous uneventful experience in the absence of using a CDK as reasoning for not using it in their most recent pregnancy.

"I gave birth to six kids at home without any such kit why should I use the kit this seventh time?" (ID 4 FGD2)

When women who had not bought the kit were asked about any suggestions to improve the CDK or its uptake, their spontaneous answer was to reduce the cost of the kit.

Some of the participants were not satisfied with the strategy used as in their view it created a mistrust with the birth attendants. One participant added,

“Women should be concerned about pregnancy and delivery as far as diet and rest is concerned; technical things should not be their headache.”(ID 4 FGD 6)

FGDs with mothers who used CDKs:

Women who used CDKs were appreciative of the way intervention was delivered. i.e., CHWs creating awareness among their household including key decision makers like mother-in-law and husband. They thought that these approaches were more useful than passive campaigns like posters or advertisements on electronic media. Many had preexisting concerns about cleanliness during the birthing process and the associated tools used.

“We are always trying to keep our home clean, eat clean food and stay healthy but cleanliness during birth is generally neglected and ignored.” (ID 1 FGD3)

Women were attracted by the packaging of all the necessary items in one kit which subsidized the cost and were easily available from nearby stores. Although individual items like blade, thread, clamp, soap were also easily available from shops, many a times they had to be bought from multiple places. The packaging in a single kit also made the storage and retrieval of the items at time of need easier in close and cramped home settings where single items could be easily misplaced. Although the cost was still substantial for the low socioeconomic households, many were willing to bear the cost given the explained benefits of CDKs.

“Fifty rupees are nothing if the benefits of the kit are kept in mind” (ID 4 FGD 4)

“We don’t care about the cost of things that are necessary. This kit seems to be essential for clean home delivery” (ID 3 FGD 4)

FGDs with birth attendants:

In all cases, birth attendants reported having no objections to the use of CDKs, had previously used the kits and expressed satisfaction with the content of the kit. They found the sheet in the kit to be extremely useful in providing a clean surface for delivery especially in home surroundings which were very unclean.

“If kits are easily available then either woman can buy and keep at homes or we can take along at the time of delivery, it solves a lot of problems.” (ID 3 FGD 6)

Birth attendants raised concerns about inconsistent distribution strategies deployed for CDKs in the past when they were sometimes provided free of cost to either the woman or birth attendant at a subsidized rate. This in turn affected their dealing with clients. One of the birth attendants said, *“I lost one of my clients when I tried to sell the kit. She had seen free distribution in her last delivery.”(ID 1 FGD 5)*

Discussion:

Our study shows that a community based social marketing strategy was effective in increasing the uptake of CDKs during home deliveries in a low socioeconomic peri-urban setting. The mixed method design enabled us to explore factors that facilitated or hindered the use of CDK by the women or their birth attendants.

We saw a 2.5 times increase in the uptake of CDKs with social marketing of these kits. Although social marketing has been used effectively to increase the uptake of modern contraceptives and other health behavioral interventions (15–17), there is no literature evaluating its use in increasing the uptake of CDKs.

Previous studies have however highlighted that the unique nature of pregnancy suggests that social marketing may be particularly effective at facilitating uptake of various health interventions. Pregnant women are more likely to seek out information regarding aspects of pregnancy and child birth than patients facing an illness (20–22). Most of them also want to be involved in decision-making (23, 24). A prospective case control study conducted in Iran showed significant reduction in unnecessary elective caesarian births amongst first time mothers who were delivered a social marketing campaign (25). Similarly, social marketing was effectively used to increase breastfeeding and reduce smoking during pregnancy in North East England (26).

In our study, the cost of CDKs was reported as a hindrance by the highest proportion of non-users and was also the most common concern raised in focus group discussions, often deemed as an extra expense or lesser priority than other materials. Earlier in Bangladesh a simple, affordable birth kit developed and field tested to sell to pregnant women in rural areas showed that cost was an impediment. This led the investigators to plan to redesign the kit in order to reduce the cost (27).

After adjusting for other variables, age of the woman and education of the husband were found to be significantly associated with use of CDKs in home deliveries. Odds of using CDK increased 1.1 times with each year increase in the age of woman. Odds of using CDKs in women whose husbands had any formal education was more than twice the odds of those whose husbands were not educated. We also found that husbands and their parents or other elders of the family were the principal decision makers. These findings are consistent with those reported by a recent study that examined the factors affecting uptake of CDKs in Nepal. It revealed that inadequate knowledge of CDKs and lack of awareness about their potential benefits appear to be the main barriers to utilization in resource poor settings. Furthermore, household decision makers such as husbands and mothers-in-law are in a strong position to be able to promote or prevent CDK use, while women of reproductive age have less power within the household (28).

The strengths of our study include that it was done in a setting with high baseline maternal and neonatal mortality with high proportion of home deliveries where maximum benefits can be reaped from the uptake of these CDKs. To the best of our knowledge, this is the first study evaluating the effect of social marketing on the uptake of CDKs. Although several studies have evaluated CHW involvement to improve

maternal and infant birth outcome using an array of interventions, this is the first study to use social marketing by CHWs to increase uptake of CDKs in Pakistan. The study also had some limitations, including the lack of a concurrent comparison group given the nature of intervention and delivery. However, we overcame this by taking CDK uptake rates during preintervention period as a comparison group.

Conclusion:

We conclude that social marketing strategy delivered by CHWs targeting pregnant women and their family members can play an important role in improving use of CDKs in home deliveries. However, many women expect that the cost of the kit to be included in charges paid to birth attendants. Price, distribution points, target audience and stake holder's involvement should be carefully considered when devising a social marketing strategy to ensure consistent and increased use of these kits in home deliveries. A combined approach targeting both pregnant women and their families as well as birth attendants may improve CDK use and be sustainable in the long run.

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