

Effects of Micro-Enterprise Services on HIV Risk Behaviour Among Female Sex Workers in Kenya's Urban Slums

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Abstract This study assessed individual-level effects of adding micro-enterprise services to a peer-mediated HIV/AIDS intervention among 227 female sex workers (FSWs) in Kenya. Survey data were collected in May–July 2003 and July–August 2005. Two-thirds of participants had operational businesses by end-line survey. Nearly half reported to have stopped sex work. Self-reported weekly mean number of all sexual partners changed from 3.26 (SD 2.45) at baseline to 1.84 (SD 2.15) at end-line survey ($P < 0.001$). Weekly mean number of casual partners did not change significantly. Weekly mean number of regular partners changed from 1.96 (SD 1.86) to 0.73 (SD 0.98) over the follow-up period ($P < 0.001$). Consistent condom use with regular partners increased by 18.5% and remained above 90% with casual partners. Micro-enterprise services may empower FSWs by giving them an alternative livelihood when they wish to exit or reduce reliance on sex work. Determinants of successful business operation by FSWs deserve further research.

Keywords Microfinance · Kenya · Female sex workers · Regular partners · Sex work

Introduction

Recent estimates indicate that 7.8% of adults (age 15–49 years) in Kenya are infected with HIV. While this represents a significant drop from an average prevalence of 10% in the 1990s, large variations still exist between males and females, along age groups and between urban and rural settings. Urban populations in Kenya have higher adult HIV prevalence (10%) than do rural populations (7%). HIV prevalence in females (age 15–49 years) in Kenya is 9.2% in comparison to 5.8% among males in the same age range. The gender gap in HIV prevalence is most pronounced in the 15–24 year age range where females are about four times more likely to be infected with HIV than their male counterparts (NASCO 2005, 2008; Cheluget et al. 2006; CBS et al. 2004).

Many factors influence women's vulnerability to HIV, including unfavourable social and economic realities (UNAIDS 2000, 2002; Gupta 2002; Sumartojo et al. 2000). More importantly, economic deprivation and dependency pushes some women into high-risk means of livelihood such as transactional sex that exposes them to risks of sexually transmitted infections (STI), including HIV. Even though Kenya's economic performance improved since 2003 following the election of a new government, these effects have not trickled down to ordinary citizens, especially those inhabiting urban slums. Kenya's real gross domestic product (GDP) growth rose from 2.8% in 2003 to 5.8% in 2005 and to around 6.0% in the subsequent 2 years, but incidence of absolute poverty has remained significant, affecting at least 29% of the urban population (GOK 2007; UNDP 2006).

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Among women of low socio-economic status engaged in sex work in Nairobi, HIV prevalence over thrice the national prevalence has been found, confirming that sex work heightens women's risks for HIV in Kenya as elsewhere (Fonck et al. 2000; Simonsen et al. 1990). In addition, recent work has pointed towards continued concentrated epidemics in female sex workers (FSWs) and their clients and the need for targeted interventions in these groups (Morris and Ferguson 2006; Ferguson and Morris 2007). However, responses targeting economic dimensions of HIV vulnerability remain limited. The scarcity of research on this subject reflects a reluctance to tackle the socio-cultural and economic determinants of HIV risks and vulnerability (UNAIDS 2002). Another reason is a pervasive notion that economic development challenges are deep-rooted and slow to change and thus lie outside of the public health arena (Olusoji et al. 2001).

The intersection between financial vulnerability and HIV risk behaviour among FSWs has long been recognised. Over a decade ago, a South African study reported that FSWs could not insist on condom use for fear of "decrease in earnings, loss of clients, and physical abuse" (Karim et al. 1995, p. 5121). The study noted that such circumstances prohibited negotiation and communication between individual FSWs and their clients. Studies in other settings have also provided strong evidence of a direct link between women's low economic status and their vulnerability and exposure to HIV (Zierler and Krieger 1997). Undoubtedly, addressing gender inequity should be integral to HIV prevention.

As HIV is largely heterosexually transmitted in Kenya as elsewhere in sub-Saharan Africa, risk reduction through consistent and effective use of condoms and reduction in number of sexual partners is important. However, heterosexual behaviour is complex. Weiss and Gupta (1998) observe that sexuality consists of: what people do sexually (practices), with whom (partners), and the underlying determinants of pleasure, procreation and power. Of these, the authors hypothesise that the balance of power between sexual partners is the greatest determinant of sexuality outcomes. Power differentials shape HIV risk as sexual activity is not entirely driven by individual choices but is negotiated within a broader social, economic and cultural context (Gupta 2002). Thus, effective behaviour change in heterosexual partnerships has to confront these structural social and economic conditions.

A popular successful effort to address structural impediments to safe sex within the context of sex work is 100% condom policy for all sex establishments that was implemented in Thailand (Celentano et al. 1998). This approach is less feasible in Kenya where sex work is predominantly informal and sex workers negotiate terms of sexual relations on their own, with no recourse to any form

of enforcement through industry gatekeepers such as managers. Within such a context, expanded economic opportunities could be an essential empowerment tool.

Economic Empowerment and HIV Risk Behaviour: A Conceptual Framework

Although many factors constrain women's control over their sexuality, poverty is prominent. Access to and control over means to make a living and receiving material benefits of this access and control is a hallmark of women's economic empowerment. Economic empowerment has beneficial impacts for women in terms of power relations at household, community and market places (Carr 2000).

Micro-enterprise services (later referred to also as microfinance) is defined as the provision of financial services such as credit, insurance, savings and in some cases, other non-financial services such as business skills training, to poor people. Micro-enterprise services/microfinance strategy is widely used to empower economically deprived groups (MkNelly and Dunford 1998; Chowdhury and Bhuiya 2001; Schuler and Hashemi 1994). The impact of micro-enterprise services is thought to occur at four levels: individual, household, enterprise, and community (Sebstad and Barnes 2000). Four pathways of individual-level effects of micro-enterprise services that are potentially transferable to many facets of women's lives, including their risks to HIV, are shown in Fig. 1.

Studies in different contexts have reported positive effects of micro-enterprise services on women's empowerment. Schuler and Hashemi (1994) using a carefully controlled study and employing contextually defined measures of empowerment found that women involved in micro-credit programmes in Bangladesh exhibited greater economic security, ability to make own purchases and freedom from family domination and violence than those in the control. Similarly, a study of Grameen Bank's clients reported that women participants were more conscious of their rights, were better able to resolve conflicts and had more control over decision-making at the household level (Sebstad and Chen 1996). A study in Sri Lanka showed that access to small loans contributed to women's independence

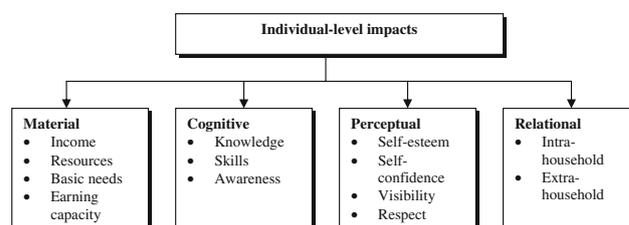


Fig. 1 Pathways of individual-level impact of micro-enterprise services. Adapted from Chen (1997)

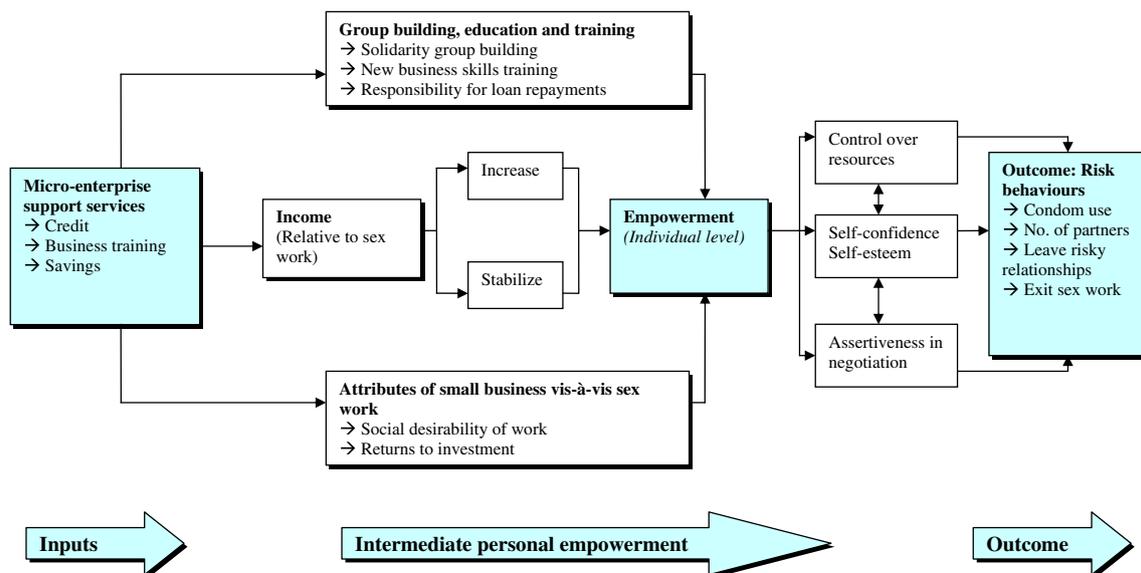


Fig. 2 A conceptual framework of the effect of micro-enterprise services on HIV risk behaviour among FSWs

in income generation, which gave them more bargaining power in relations with male family members (Hulme et al. 1996). Nearer Kenya, a recent cluster randomised controlled study reported 55% reduction in incidents of physical and/or sexual abuse over a 12-month follow-up period among 430 rural South African women who received micro-enterprise services and participatory training (Pronyk et al. 2006).

Our study assessed individual-level effects of adding micro-enterprise services to HIV prevention interventions for FSWs. The conceptual framework applied posits that access to micro-enterprise services (credit finance, savings and business skills training) empowers FSWs through: (a) changes in income; (b) positive attributes of small business activities vis-à-vis sex work; and (c) social and business skills building, which act to improve their control over resources, increase their self-esteem and self-confidence and improve their assertiveness in negotiations, thereby enabling them to achieve HIV risk reduction outcomes of increased condom use, reduced number of sexual partners and exit from sex work if wished (Fig. 2).

The study is described and its results reported in accordance with the checklist for Transparent Reporting of Evaluations with Non-randomised Designs (TREND) for behavioural and public health interventions (Des Jarlais et al. 2004).

Setting and Methods

Background

This study is based on Strengthening STD/HIV Control Project in Kenya (SHCP), a collaborative initiative of the University of Nairobi and University of Manitoba, Canada,

that involved peer-mediated education for FSWs in Kenya. A few FSWs, initially identified through informal contacts and use of key informants, were trained to recruit and educate their peers on STI/HIV prevention, care and support. The training of the peer leaders focused on safer sex negotiation, STI/HIV education and counselling and promotion of consistent condom use. Condom promotion included training on condom supply sources, storage, proper use and disposal and encouraging rejection of potential clients who refuse to use condoms for sexual relations. Additional educational messages to the peer leaders included the importance of reducing number of sexual partners, avoiding unprotected vaginal and anal sex, increasing use of non-penetrative sex and avoiding all sex during menses. The peer leaders' efforts were complemented by social and health workers based at local primary health facilities who received training in community mobilisation, counselling skills and syndromic STI management (Ngugi et al. 1996).

Following more than 5 years of participation in peer education groups, the FSWs began to make requests for support to undertake other business activities besides sex work. Accordingly, the SHCP partnered with a microfinance organisation to provide credit and business skills training as an additional component to the HIV prevention programme described above. The microfinance organisation was to manage and deliver a loan fund for small businesses while the SHCP continued with peer education and condom promotion activities. A pilot project involving 102 FSWs was implemented from 1998 until 2002.

The pilot project suggested that participation in micro-enterprise activities could reduce FSWs' risks to HIV. Using a before-and-after without control study design, 17%

of the 102 women involved in the programme reported to have exited sex work. Self-reported daily mean number of sexual partners among the women who continued with sex work declined almost twofold from 3.45 at baseline to 1.76 eighteen months later (Odek et al. 2002, 2004).

An expanded phase of the above project was launched in 2003 targeting women from the Project sites in Nairobi and its environs that were not involved in the pilot study. By end of 2003, this new phase had recruited 307 FSWs. The present study focuses on this expanded phase of the intervention.

Design and Methods

The study adopted a pre-post without control research design. Three elements of the intervention were critical in the choice of the research design. First, the programme had a pre-set maximum number of prospective participants that could be supported with the available loan fund. Thus, recruiting additional controls from would-be clients with the hope of eventually providing them with credit as is usually recommended for microfinance research would have been both impractical and unethical (Sebstad et al. 1995; Sebstad and Barnes 2000). Second, as the programme was already running prior to initiation of evaluation activities, the researchers had no control over the timing of activities, including that of recruitment of programme participants. Third, voluntary participation in the programme and sex workers' different motivations for engaging in micro-enterprise activities potentially result in self-selection bias. As recommended by Rossi et al. (1999, p. 32), we have had to "tailor the evaluation design to the particular purposes and circumstances".

Participants

Eligibility Criteria

Requests for support with microfinance came from the women after their participation in HIV peer education groups. The eligibility criteria for participation in the additional micro-enterprise services programme included the following: (a) attendance and participation in at least half of on-going peer education site meetings over the past 6 months; (b) age 18 years and above; (c) residence in the Project sites for the last at least two consecutive years to ensure follow-up; (d) confirmed involvement in sex work; (e) report of a minimum three different sexual partners monthly; (f) confirmation of no history of loan default and not currently receiving credit from any other credit programme; and (g) free verbal consent to participate.

It is notable that past experience with operating a micro-enterprise, a common requirement for participation in conventional microfinance programmes, was not an

eligibility criterion for this programme. The waiver of this requirement was to ensure access to all sex workers with an interest in diversifying their income activities.

Recruitment

The study participants were contacted by their trained peer leaders and called to general community-based awareness raising meetings. These meetings elaborated on the intervention strategies including eligibility criteria, credit delivery approach and business skills training. Subsequent meetings were held a week later with the women who had expressed an interest in the project. These women were allowed 1 week to identify other members with whom they could voluntarily form into credit groups of five to fifteen members. Formation of self-selected groups was particularly important as the approach for delivery of credit was group-based, where individual women were required to serve as guarantors of loans given to members of their groups. The co-guarantee mechanism could only work effectively if the women exercised free choice of their group members. The women were then recruited into the study as units of the self-selected credit groups of five to fifteen members rather than as individuals.

Interventions

The micro-enterprise initiative was added to the peer education behavioural risk reduction model already described. The intervention involved three key strategies: (a) credit for small business activities; (b) business skills training and mentorship; and (c) promotion of a savings culture among the FSWs. These services were provided by Credit Officers from a collaborating microfinance organisation. The credit delivery approach followed the model developed by Grameen Bank of Bangladesh (Berenbach and Guzman 1994). The intervention strategies are elaborated in Table 1.

Outcomes

The outcomes of interest were the following: (a) number of sexual partners; (b) self-reported condom use; and (c) exit from sex work. Data on these outcomes were elicited through the following questions.

Number of Sexual Partners

"How many sexual partners did you have in the past one week? Of all the sexual partners you had in the past one week, how many were casual (met for the first time) or regular (those with whom you have had repeated sexual contact)?" For respondents who reported no sexual partner in the week preceding the interview, the value zero was entered and used

Table 1 Description of intervention strategies

<i>Credit services</i>	
Key elements of the credit services	
	Support of low-risk economic activities that generate regular income
	Provision of loans to women organised into loan groups made up of 5–15 members
	Weekly group meetings
	Weekly loan repayments
	Group-guarantee of loans
	Fixed interest on loan at 15% per annum calculated on straight line basis
Loan size	
	First loan: A maximum of Kenya Shillings 15,000 (US\$200)
	Subsequent loans: increased by between US\$100–200
Loan repayment	
	Loan repaid in equal weekly cash instalments over 52 weeks
	Weekly meetings held in Project site offices for loan repayment and savings collections
Loan grace period	
	Two weeks allowed from the date of receiving loan before starting repayment
Loan disbursement procedure	
	Loan funds paid to each woman through direct transfer to a bank account that was opened by the Project for each participant
Loan repayment incentives	
	Access to subsequent loans made contingent upon all credit group members repaying fully their previous loans
<i>Business skills training</i>	
	Two types of business skills training were implemented: pre-loan and post-loan business training
Pre-loan business training	
	Trainings were delivered by trained Credit Officers to credit groups made up of 15–25 members. Three-hour business training sessions were conducted once a week for 8 weeks before the women received loans. Trainings were held in Project site offices
Week 1	
	Training on group leadership and dynamics
	Registration of individual group members
	Election of group officials
	Beginning of individual savings.
Week 2	
	Training on loan policy and procedures and merits and demerits of loans
Week 3 and 4	
	Training on how to generate and analyse a business idea
	Personal characteristics for successful business operation
	Business feasibility study
Week 5 and 6	
	Business planning training
Week 7 and 8	
	Business record keeping training

Table 1 continued

Post-loan training	
	This involved one-on-one business counselling, group business training and field-based mentorship. The training content was based on business management problems reported by the women during weekly meetings or identified by the Credit Officers during their weekly field visits
<i>Savings</i>	
	The women contributed mandatory weekly savings of Ksh. 100
	The savings monetised the group-guarantee hence served as a partial security for the loans disbursed
	Upon full repayment of loan by each member of the credit groups, the individual savings were given back to the women. However, if a member of a credit group defaulted, her savings were converted to loan repayments and any balance thereof was settled through further attachment of the savings of her guarantors
	Savings were collected during regular weekly meetings
	Each woman kept a record (banking pass book) of all savings and loan repayments made

in the analysis. It was common for the women who reported to have exited sex work to also report that they had no sexual partner in the week preceding end-line interview.

Condom Use

“What proportion of all casual sexual partners you had sex with in the last one week did you use condoms with (all, most, none)? What proportion of all regular sexual partners you had sex with in the last one week did you use condoms with (all, most, none)?”

Exit from Sex Work

“Are you still involved in sex work?” (Yes or No). This question was asked only at end-line survey.

Sampling and Data Collection

The project was implemented in Kibera slums in Nairobi with an estimated population of 300,000 people. Baseline data were collected from the women at the point of their recruitment into the programme. Some of the women recruited did not stay on to receive intervention activities. Figure 3 shows the women’s flow through different stages of the intervention.

A baseline survey was conducted among all the women who attended recruitment meetings. Some of the women interviewed at this stage later withdrew from the intervention partly because by this stage, they had not fully understood the intervention strategies and requirements for effective participation. Other reasons for losses to follow-up were death, change of physical residence and loan

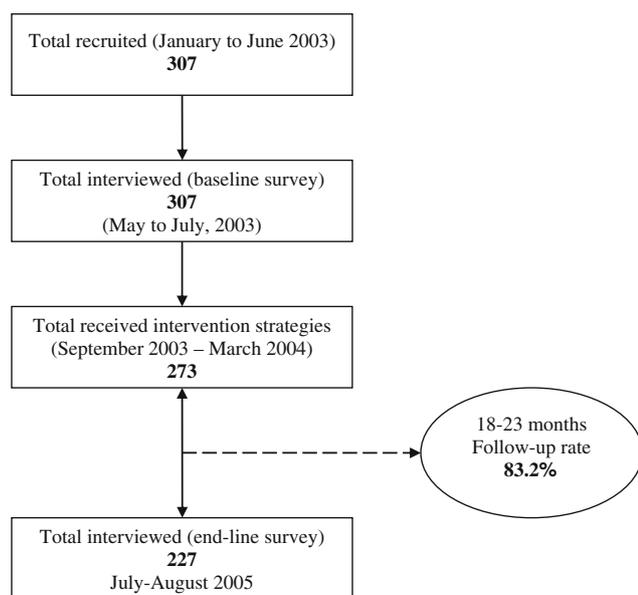


Fig. 3 Participants' flow through different stages of the intervention

default. Disharmony and distrust within some credit groups also led to withdrawal.

Self-reported behavioural data were collected using a face-to-face interviewer-administered questionnaire. The interview instrument was translated into Kiswahili, a local language. Six female interviewers were recruited from a survey administration organisation to conduct the baseline survey. Eight FSWs with secondary level education who were not involved in the micro-enterprise initiative were employed to conduct the end-line survey. The interviewers in each instance were trained for 3 days on interviewing skills and questionnaire administration. Interviews in both surveys were conducted at the women's business site, residential area or at central project offices. Each interview lasted around 45 min to 1 h. Experiences have shown that with proper training, FSWs elicit reliable data from their peers (Elmore-Meegan et al. 2004; Karim et al. 1995).

SHCP, upon whose field activities this project was based, was approved by the Government of Kenya and Ministry of Health. All its interventions were also approved by Kenyatta National Hospital Ethics Review Committee. No special ethical clearance was required for this intervention-linked evaluation study. An allowance of Kenya Shillings 500 (approximately US\$ 7) was paid to each study participant at end-line rather than baseline survey to compensate for time spent on interviews that was regarded as an opportunity cost to their businesses.

Analysis

Cohort and cross-sectional data were analysed using SPSS (version 12). Cohort analysis assessed differences in

number of sexual partners and condom use between paired baseline and end-line survey data. This was conducted using paired *t*-test for continuous data and non-parametric sign test for proportions. Additionally, binary and multinomial logistic regression analyses were conducted to assess predictors of the three outcomes of interest at both baseline and end-line surveys. The measure of effect for the multivariate analysis is odds ratio (OR). In constructing regression models, we fitted all variables that were hypothesised to be related to the outcomes of interest. As long as the overall model remained stable as measured by chi-square deviance statistic, we did not drop individual predictor variables even if they did not attain statistical significance. The implication of this approach is that it could underestimate rather than overestimate the magnitude of effect of the reported predictors. For baseline data, the independent variables entered into the regression models for different outcomes included respondent's age, age at starting sex work, number of dependents, level of education and marital status (ever versus never been married). The same independent variables were included in regression models for end-line data with the addition of measures of exposure to the intervention, namely, amount of loan received and operational status of the business. The theoretic basis for selecting these predictor variables is elaborated below.

Age

In exploring the link between age and business uptake and change in sexual behaviour, we hypothesised that older women were more likely than younger ones to succeed in running alternative economic activities. Older women would not be as aggressive as their younger counterparts and because of high competition with younger sex workers, might opt out of or seek reliable alternatives to sex work. A decline in demand for older women might also motivate them to seek more stable livelihood strategies.

Education

With respect to uptake of alternative economic activities and related sexual behaviour change, educational attainment might have a mixed effect. Lower educational attainment might encourage women to take up alternative economic activities because of limited options for other forms of employment. By the same token, lower educational attainment might hinder success of business activities initiated by the women due to their low perception of market opportunities and limited understanding and application of sound business management principles.

Higher educational attainment might enhance success of alternative economic activities started by the women as

they would have a better understanding of market opportunities, business management practices and principles. Conversely, higher educational attainment might have an attitudinal impediment to the success of business activities initiated by FSWs particularly where higher educational achievement is associated with formal employment as opposed to employment in the informal sector.

Number of Years Involved in Sex Work

The number of years of involvement in sex work might also influence uptake of alternative economic activities and related sexual behaviour change among FSWs in mixed ways. Women who have been sex workers for a longer period might be more resilient in undertaking alternative economic activities if demand for their services is decreasing. However, such women might also have become more entrenched in sex work and therefore unwilling to actively pursue alternative economic activities. They might also become impatient with uncertain business incomes and heavy responsibilities involved in running a business.

Women who have been sex workers for a shorter period are more likely to be younger and still experiencing higher demand for their services. Such women might be more inclined to return to sex work if the demands of running alternative economic activities prove difficult. On the other hand, younger women who have been involved in sex work for a shorter duration and experienced the risks associated with sex work might desire to change their lives by taking up alternative economic activities.

Number of Dependents

More dependents imply heavier cost and requirements of providing for them adequately. Accordingly, FSWs with a higher number of dependents are more likely to take up alternative economic activities to enhance their income security. Those with fewer dependents might not be as committed to running alternative economic activities as their counterparts with more dependents because the demands and requirements to provide for fewer dependents could be lower and might probably be sufficiently met through sex work incomes.

Results

Participants

Baseline and end-line data were collected from 227 women who enrolled and received intervention strategies in this programme. The women lost to follow-up were similar to those interviewed at end-line with respect to key

background characteristics, namely: age, education and baseline HIV risk behaviour.

Socio-Demographic Characteristics and Sex Work Profile

The 227 women interviewed at both baseline and end-line had a mean age of 41.09 (SD 9.54) years and a mean of 4.21 (SD 2.09) dependents. The majority of the women had attained at least primary level education (Table 2).

The women in this study were involved in informal sex work, defined as independent sexual liaisons without intermediation of managers or establishments such as brothels (UNAIDS 2002). The women reported that they met their clients and conducted sex work in the following places: bar/night club (57.1%); their home (31.9%); street (6.6%); and hotel/guest house (4.4%).

Table 2 Respondents' socio-demographic characteristics and intervention exposure measure

<i>Socio-demographic characteristics</i>	
Age	
≤29 years	32 (14.2%)
30–44 years	101 (44.7%)
≥45 years	93 (41.2%)
Total	226 (100%)
Mean (Standard Deviation)	41.09 (SD 9.54)
Age started sex work	
≤19 years	76 (33.8%)
20–29 years	104 (46.2%)
≥30 years	45 (20%)
Total	225 (100%)
Mean (Standard Deviation)	23.41 (SD 7.43)
Number of dependents	
1–3 dependents	89 (41.4%)
≥4 dependents	126 (58.6%)
Total	215 (100%)
Mean (Standard Deviation)	4.21 (SD 2.09)
Marital status	
Ever married	142 (62.6%)
Never married	85 (37.4%)
Total	227 (100%)
Education	
No formal education	39 (17.3%)
Primary school	124 (55.1%)
Secondary school	62 (27.6%)
Total	225 (100%)
<i>Intervention exposure measure</i>	
End-line business status	
Business still operational	148 (65.2%)
Business ceased operation (collapsed)	79 (34.8%)
Total	227 (100%)

Profile of Micro-Enterprise Activities

At end-line survey, the women had received only one loan round. Those who had completed repaying the first loan were preparing for a second loan. The following analysis is, therefore, based on the first loan. The ceiling for the first loan was Kenya Shillings 15,000 (approximately US\$200); the mean received by the women was Kenya Shillings 11,683. The loans were issued for a term of 1 year at 15% annual interest and repaid in equal weekly instalments. Financial records showed that on-time loan repayment was at 65% for the first loan.

The respondents reported to have invested 80% of their first loan in business activities and put the remainder to other uses. The majority (82.5%) of the women engaged in trading businesses in commodities such as cereals, fruits and vegetable, new and used clothes and general retail shop merchandise. Ten percent of the women engaged in manufacturing enterprises such as sewing new clothes and extracting fruit juice while the rest (7%) were involved in service-oriented businesses such as hairdressing salons and food kiosks/hotels.

Nearly two-thirds (65.2%) of all the women had their business enterprises still operational by the end-line survey, while the rest had ceased activities in the course of the study period. The reasons for business closure were: business management challenges such as high business overheads, unfavourable competition and inadequate capital (65%); personal problems (27%); and unknown cause (8%).

In multivariate analysis of cross-sectional data, only level of education was a significant predictor of business survival. Compared to either no formal education or secondary education, women with primary education had increased odds (2.909 adjusted OR 95% CI 1.442–5.866) of having ceased business operation during the follow-up period, controlling for age, age at starting sex work, marital status, number of dependents, continued involvement in sex work and loan amount received.

Main Study Outcomes

Exit from Sex Work

Over half (54.6%) of all the women reported that they were still involved in sex work at end-line survey while the rest said they had stopped. In multivariate analysis of end-line cross-sectional data, the only statistically significant predictor of exit from sex work was age at starting sex work. An increase in age at starting sex work by 1 year reduced by a factor of 0.043 the likelihood of remaining in sex work by end-line survey (Adjusted OR 0.958; 95% CI 0.922–0.995), controlling for current age, marital status,

operational status of own business, education, number of dependents and value of loan received.

Number of Sexual Partners

Overall, self-reported mean number of all sexual partners in the week preceding the interview changed from 3.26 (SD 2.45) at baseline to 1.84 (SD 2.15) at end-line survey ($P < 0.001$). There was no statistically significant change in self-reported weekly mean number of partners categorised as casual that was 1.43 (SD 2.55) at baseline and 1.12 (SD 1.53) at end-line survey ($P = 0.098$). Self-reported weekly mean number of regular partners changed from 1.96 (SD 1.86) at baseline to 0.73 (SD 0.98) at end-line survey ($P < 0.001$) (Table 3).

In multivariate analysis of cross-sectional data, significant predictors of baseline number of all sexual partners as well as casual and regular categories were respondent's current age and number of dependents. The odds of reporting 1–3 partners rather than ≥ 4 partners in the week preceding the interview at baseline decreased by a factor of 0.038 for every 1 year increase in age, controlling for other factors, even though this finding was barely statistically significant ($P = 0.06$). Similarly, the odds of reporting 1–3 partners rather than ≥ 4 partners in the week preceding the interview at baseline decreased by a factor of 0.140 for every one additional dependent ($P = 0.06$). A similar but statistically not significant direction of influence was observed for casual partners. However, for baseline regular partnerships, a one unit increase in number of dependents increased by a factor of 0.165 the odds of reporting none (zero) as opposed to ≥ 1 partners (Table 4).

In the analysis of end-line data, we explored the potential influence of business operational status and value of loan received on number of sexual partners by adding these variables to the multivariate model applied to the baseline data. As in baseline findings, the respondent's age and number of dependents remained the only significant predictors of reported weekly number of all sexual partners. The level of education was a significant predictor only in the case of total number of sexual partners but not for casual or regular partners. Similar to the baseline findings, beta coefficient (β) for number of dependents was negative, suggesting a converse relationship between reported number of dependents and sexual partners (Table 4).

Condom Use

Data on condom use were collected for each partner category. Self-reported condom use with all casual sexual partners remained high at both survey points. There was a significant increase in self-reported consistent condom use

Table 3 Main study outcomes

Study outcomes	Baseline	End-line	P-value
End-line involvement in sex work			
Yes	n/a	124 (54.6%)	n/a
No	n/a	103 (45.4%)	
Total	n/a	227 (100%)	
<i>Number of sexual partners</i>			
All partners			
None (zero) partner	19 (8.4%)	104 (45.8%)	
1–3 partners	128 (56.4%)	70 (30.8%)	
≥4 partners	80 (35.2%)	53 (23.3%)	
Total	227 (100%)	227 (100%)	
Mean (Standard Deviation)	3.26 (SD 2.45)	1.84 (SD 2.15)	<0.001*
Casual partners			
None (zero) partner	129 (56.8%)	119 (52.4%)	
1–3 partners	67 (29.5%)	95 (41.9%)	
≥4 partners	31 (13.7%)	13 (5.7%)	
Total	227 (100%)	227 (100%)	
Mean (Standard Deviation)	1.43 (SD 2.55)	1.12 (SD 1.53)	0.098*
Regular partners			
None (zero) partner	55 (24.5%)	117 (51.5%)	
≥4 partner	171 (75.3%)	110 (48.5%)	
Total	227 (100%)	227 (100%)	
Mean (Standard Deviation)	1.96 (SD 1.86)	0.73 (SD 0.98)	<0.001*
<i>Condom use</i>			
Casual partners			
All used condoms	90 (93.8%)	104 (95.4%)	0.727**
Most used condoms	4 (4.2%)	5 (4.6%)	
None used condoms	2 (2%)	0	
Total	96 (100%)	109 (100%)	
Regular partners			
All used condoms	131 (78.9%)	100 (93.5%)	
Most used condoms	16 (9.6%)	3 (2.8%)	
None used condoms	19 (11.4%)	4 (3.7%)	
Total	166 (100%)	107 (100%)	0.031**

SD standard deviation, n/a not applicable

* Paired *t*-test

** Sign test (non-parametric)

with regular partners (Table 3). Owing to the small sub-sample size, further stratified analysis has not been conducted on this particular outcome.

Discussion

This study assessed individual-level effects of adding micro-enterprise services to a sex worker HIV/AIDS

intervention in Kenya. The data collected focuses on the effects of the first round of loan provided to the participants. Two-thirds of the women sustained their businesses over the follow-up period. Close to half (45.4%) of the women reported to have stopped sex work and said they had no sexual partners in the week preceding the end-line survey. Weekly mean number of casual partners did not change significantly from a baseline figure of 1.43 (SD 2.55) to 1.12 (SD 1.53) at the end-line survey. Weekly mean number of regular partners changed from 1.96 (SD 1.86) to 0.73 (SD 0.98) over the follow-up period ($P < 0.001$). Self-reported condom use with all regular partners increased from 78.9% at baseline to 93.5% at end-line survey and remained at a high level (above 90%) with casual partners. Significant predictors of reported number of sexual partners were the respondents' age and number of dependents, and to a minor extent, level of education especially at end-line survey. The amount of loan received by the women and the operational status of their businesses were not significant predictors of either their reported number of sexual partners or the likelihood of leaving sex work.

Even though the lack of a control group makes it difficult to isolate potential secular effects on the outcomes reported above, the findings are nevertheless suggestive of the general direction of changes that may occur in sexual risk behaviour among sex workers as a result of economic empowerment. We think also that even if the women who self-selected into this programme could potentially have been more motivated to change their sexual behaviour or exit sex work than those who did not, it is still a useful exercise to explore their characteristics because it might well be that this is the category of women for whom the promotion of micro-enterprise services makes more sense.

The finding on FSWs' reduction of number of regular partners and increased use of condoms within these relationships is important for HIV prevention. The women who continued sex work maintained a weekly mean of about one casual partner but significantly reduced the number of regular partners from a weekly mean of around two to one over the follow-up period. Self-reported consistent condom use with regular partners increased by nearly 20% during the intervention period. Day and Ward (1997) have observed that HIV risk behaviour in sex work depends much on the type rather than the absolute number of sexual partners. Many studies have also documented lesser condom use within regular as compared to casual partnerships due to the growth in intimacy and material and other forms of exchange between the partners (Ferguson and Morris 2007; Elmore-Meegan et al. 2004; Karim et al. 1995). The reported improvements reflect the potential influence of economic empowerment among FSWs on regular sexual partnerships and its associated risks.

Table 4 Multivariate analysis of correlates of number of sexual partners

Correlates ^a	Baseline		End-line	
	Crude OR (95% CI) ^b	Adj OR (95% CI) ^c	Crude OR (95% CI) ^b	Adj OR (95% CI) ^c
<i>Weekly all sexual partners^d</i>				
None (zero) partner				
Age	0.962 (0.912–1.105)	0.966 (0.899–1.038)	1.029 (0.993–1.066)	1.061 (1.010–1.114)*
Number of dependents	0.914 (0.717–1.166)	0.954 (0.734–1.240)	0.883 (0.753–1.036)	0.809 (0.671–0.976)*
Education				
No formal education	0.635 (0.159–2.533)	1.102 (0.215–5.641)	0.429 (0.158–1.165)	0.215 (0.063–0.734)*
Primary level education	0.488 (0.150–1.581)	0.641 (0.188–2.180)	0.655 (0.280–1.529)	0.736 (0.290–1.869)
Secondary education	1	1	1	1
Business status	n/a	n/a	1.838 (0.934–3.619)	1.818 (0.839–3.940)
1–3 partners				
Age	0.963 (0.934–0.993)*	0.963 (0.925–1.002)	1.000 (0.963–1.039)	1.017 (0.965–1.072)
Number of dependents	0.861 (0.748–0.991)*	0.869 (0.750–1.008)	0.811 (0.676–0.972)*	0.765 (0.618–0.946)*
Education				
No formal education	0.540 (0.228–1.277)	0.215 (0.063–0.734)*	0.227 (0.070–0.736)*	0.188 (0.044–0.803)*
Primary level education	1.059 (0.543–2.066)	0.736 (0.290–1.869)	0.666 (0.274–1.619)	1.096 (0.408–2.944)
Secondary education	1	1	1	1
Business status	n/a	n/a	2.232 (1.056–4.717)*	2.181 (0.932–5.100)
<i>Weekly casual partners^d</i>				
None (zero) casual partner				
Age	0.969 (0.930–1.011)	0.970 (0.916–1.027)	1.055 (0.990–1.123)	1.094 (1.006–1.189)*
Number of dependents	0.787 (0.652–0.950)*	0.782 (0.639–0.956)*	0.804 (0.626–1.032)	0.730 (0.546–0.975)*
Business status	n/a	n/a	2.487 (0.785–7.905)	1.936 (0.563–6.656)
1–3 partners				
Number of dependents	0.973 (0.930–1.019)	0.818 (0.661–1.013)	1.037 (0.973–1.105)	0.798 (0.600–1.062)
Business status	n/a	n/a	2.093 (0.651–6.733)	1.589 (0.463–5.456)
<i>Weekly regular partners^e</i>				
None (zero) regular partner				
Age	0.999 (0.968–1.031)	0.998 (0.957–1.041)	1.033 (1.005–1.063)*	1.048 (1.009–1.088)*
Number of dependents	1.148 (0.991–1.331)	1.180 (1.007–1.382)*	0.993 (0.874–1.130)	0.921 (0.797–1.065)
Business status	n/a	n/a	1.335 (0.772–2.309)	1.318 (0.717–2.423)

n/a not applicable

^a Only predictors that attained P -value ≤ 0.05 for baseline and/or end-line data are reported

^b Crude Odds Ratio (OR) are based on bivariate analysis

^c Adjusted OR control for age, age at starting sex work, dependents, education, and for end-line data, business status and loan received are added

^d Reference category is ≥ 4 partners

^e Reference category is ≥ 1 partners

* P -value ≤ 0.05

The survival rate (65% over 18 months) of enterprises run by the sex workers in this programme is consistent with estimates from previous studies of micro-enterprise activities in Kenya. Previous studies have estimated that “about two-thirds of all new Kenyan enterprises with less than five employees perish within three years of establishment and only 15% last longer than five years” (World Bank 1994, p. 7; Parker and Torres 1994). The reasons for this dismal performance of micro-enterprises include structural

impediments such as cumbersome licensing requirements, limited access to finance and cut-throat competition. Like their counterparts in the general micro-enterprise sector, the long-term survival of micro-enterprise activities run by sex workers will require additional interventions such as market information and access and technical skills training to improve their productivity and profitability.

The persistence of transactional casual sexual liaisons among the study participants could suggest that

micro-enterprise activities initiated by the women were not yet providing sufficient income to help them completely substitute sex work incomes. A longer follow-up period that traces sexual behaviour change along business development phases could provide better insights.

In its efforts to address the unique characteristics of its clientele, this programme did not achieve some of the conventional benchmarks of microfinance such as near-100% loan repayment rate. Because of morbidity among some of its clientele, some best practices in microfinance such as exerting group-pressure on members to ensure on-time loan repayment or delaying subsequent loans until defaulters defray their debts could not be applied consistently. Bad debts occasioned by clients' illness or death were written off. This explains the low (65%) loan repayment rate and delayed disbursement of subsequent loans. An earlier study among a similar target group reported that 6% of 118 FSWs who received credit finance for small businesses died in the course of a 12-month loan term. The amount of loan written off over this period in respect of client deaths represented 3% of the total loan fund that was disbursed to all the women. The study further noted that healthy members within the credit groups felt it unfair to be held responsible for repaying debts of their ill counterparts (Odek et al. 2002).

A subject of relevance for targeting of responses is the age profile of the women who entered into this programme. These women were older (average age 41 years) in comparison to the peak age (15–24 years) during which the majority of young girls and women get infected with HIV in Kenya. The relationship between women's age and their participation in micro-economic enterprises is, however, little studied. Mitulla (2004) observes that street trade in Africa, the type in which the majority of the women in this study were engaged, typically involves fewer women below 20 years of age. Given their advanced age, the women involved in this study could have used micro-enterprise activities to facilitate their decision to exit sex work at a time when it was decreasingly profitable or acceptable. Younger women may not feel motivated to exit sex work in the same way and therefore could respond differently to the intervention.

Some methodological limitations of the study should be acknowledged. The study relied on self-reports of HIV risk behaviour without biomarkers. Secondly, given the self-selection of participants into the micro-enterprise initiative, it was not possible to include a proper control group to assess the effects attributable to the intervention. The study involved women who had been involved in a targeted HIV prevention programme for a mean of 5 years, potentially introducing social desirability bias. However, the employment of familiar sex workers as data collectors could have reduced this effect. We recognise that ethical and

operational challenges precluded the application of the best methods for cause-effect analysis. Nonetheless, the results of this study reflect findings in other settings that suggest the ways in which women's economic participation can contribute to their wider empowerment, including their ability to reduce vulnerability to HIV.

Conclusions

Microfinance and micro-enterprise economic activities can empower FSWs to make safe choices and increase their opportunities, thus reducing their vulnerability to HIV. The empowerment is reflected in the women's ability to reduce HIV risk behaviours, notably, ceasing sex work, reducing number of sexual partners and improved condom use. Given the seeming association between older age and the uptake of micro-enterprise activities, more effort should be devoted to the design of appropriate economic empowerment strategies for younger women and further study of this group. FSWs' motivations for participating in micro-enterprise activities, its effects on their sexual relationships and the specific role of regular partners in their livelihood strategy deserve further research.

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