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IMPLEMENTING TOOLS TO PROMOTE ADHERENCE TO ANTIRETROVIRAL THERAPY AT FACILITIES IN KENYA

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ABSTRACT

***Background*: Lack of effective systems and tools to identify and track defaulters are some of the factors that pose challenges in adherence monitoring for patients on anti-retroviral treatment (ART). An intervention was performed to introduce a facility-based appointment keeping system, and a revised clinic form to monitor patients' adherence to ART.**

***Objective*: To assess facility staff perceptions of, motivation for and self-reported practice in the implementation, and on the use of adherence-based indicators to inform decisions for performance improvement.**

***Design*: Qualitative explorative study aiming to evaluate a quasi-experimental intervention.**

***Settings*: Six conveniently sampled health facilities in Kenya located in Central, Eastern and Rift Valley provinces.**

***Subjects*: Thirty-six clinic staff members were interviewed, six at each facility, including facility managers, clinicians, nursing and pharmacy staff, counsellors, health records information officers and social workers. Analysis was performed in line with the Pettigrew and Whipp framework.**

***Results*: Providers perceived that the intervention had empowered them to assess their clinic's daily workload and to identify those patients who missed their appointments. Factors enhancing the positive uptake of the intervention included the availability of tools to monitor appointment keeping, training on adherence principles and supervisory support. Early detection of treatment defaulters helped the providers design targeted patient support to enhance appointment keeping.**

***Conclusion*: The effect of the intervention led to implementation of changes within the clinic to enhance patients' appointment keeping and improve adherence to treatment. We expect the reported and observed changes to be sustainable as data generation and calculation of indicators to inform decision-making were performed by the providers themselves.**

INTRODUCTION

In recent years, great gains have been achieved in access to treatment for the estimated 34 million people living with HIV worldwide, with more than eight million now on treatment (1). The achievements have been largely due to concerted efforts by governments and development partners (2,3). Reports have indicated that Kenya has experienced a decline in HIV prevalence from 7.2% in 2007 (4) to 5.6% in 2012 (5) with over 500,000 patients on anti-retroviral treatment (ART) at over 1,000 facilities (6,7).

Success of ART is dependent on the patients' adherence to treatment as evidenced by studies that have shown that optimal therapeutic outcomes can only be achieved with near perfect adherence (3,8,9), and that a well functioning health system with a strong client-provider relationship is necessary to achieve good adherence and reduce patient dropout (10-12). However, most health systems in low- and middle-income countries are under-resourced with inadequate infrastructure and human capacities (11,12).

In Kenya, decentralisation of health services has led to increased access and availability of ART at the lower levels of care (13,14), which has increased the challenge of monitoring and maintaining adherence rates (11). In addition, difficulty in tracking patients and identifying defaulters, lack of adherence-monitoring tools and lack of national guidelines on adherence monitoring have been identified as challenges affecting the ART program in Kenya (7,11). Staff shortage, poor infrastructure, lack of resources, heavy work load, poor data management and lack of information on patients on treatment (12) are some of the factors that affect health workers' performance. These factors impact health care providers' ability to assess and monitor adherence, which is essential for routine care of HIV-infected people (12). For example, appointment-keeping rates, which have been shown to correlate with clinical outcomes (15), vary widely between facilities (16).

The use of appointment-keeping indicators has been recommended by the International Network for the Rational Use of Drugs Initiative on Adherence to Antiretrovirals (INRUD IAA) as a mechanism to support patient adherence to ART. These appointment-keeping indicators are 1) the percentage of patients who attended the clinic on or before the day of their appointment; and (2) within 3 days of their appointment (16). The first indicator included all the patients that came to the clinic on or before the appointed day, while those patients who may have missed their appointment day but came within three days were included in the second indicator. Since most of the CCCs issued 28-day appointments and medicines for 30 days, it was likely that these patients did not miss their doses if they came on their appointment day or within three days. The ability to generate appointment-keeping indicators and a list of patients who have missed appointments was perceived as an important factor in supporting patient adherence to ART (17).

To assess the effectiveness of interventions to strengthen health systems we need to evaluate both process and context (18). Thus, in this study, we have explored the staff's perceptions of, motivation for and self-reported practice in an intervention comprising implementation of an appointment-keeping system and the use of adherence-based indicators to improve performance at ART facilities in Kenya.

MATERIALS AND METHODS

This was a qualitative study to evaluate an intervention that aimed at improving patients' adherence in ART facilities in Kenya. Data were collected through semi-structured interviews with providers, and group sessions with staff using the SWOT (Strengths, Weaknesses, Opportunities, and Threats) methodology (19).

Six public health facilities in three provinces were purposely selected for the intervention study: three in Rift Valley; one in Central; and two in Eastern province. The intervention was four-pronged: 1) Introduction of an appointment-keeping diary used to schedule patient visits and track patient clinic attendance. The diary comprised a 12-month record for each patient where the scheduled appointment date and the exact attendance date were recorded for each visit; 2) Concomitant introduction of a modified routine patient monitoring form (coded as national health information systems form MoH 257), where a standardised question asking patients about adherence to treatment in the last three days, was added; 3) Training of staff on basic adherence concepts, including how to extract data from the diary to calculate the attendance-based indicators (20), and how to use the data to inform decision-making at facility level; 4) Supportive supervisory visits during the initial phase of the study.

The intervention was first implemented in three facilities in March 2009, and the subsequent three facilities followed three months later from June 2009. The intervention tools and methods to generate indicators were introduced during the initial training through exercises and case studies. Facilities then measured the percentage of patients who attended the clinic on or before the day of their appointment or within three days of their appointment, and also their self-reported adherence. The research team made three reinforcement visits after two, six and ten weeks to review how the diary and form MoH 257 were used, and how indicators were calculated. At each visit a joint meeting was arranged with the comprehensive care clinic (CCC) team to identify gaps and challenges in the implementation of the intervention. Additional supportive supervisory visits were conducted to each of the intervention study sites in December 2009 to guide the facilities on the New Year changeover of the 12-month diary and attend the CCC meeting to observe the use of calculated indicators.

In total, 36 CCC staff members were interviewed including the facility manager (in-charge), clinicians (including clinical officers and medical officers), nursing staff, counselors, health records information officers, social workers and pharmacy staff. We used a semi-structured guide, which sought to assess the interviewees' perceptions of the intervention, its usefulness in monitoring adherence and the

challenges faced during the implementation. The guide was developed by the research team, and was pilot tested in other facilities and revised before use. The research team leader conducted a face - to - face semi-structured interview with each respondent. Prior to the interview, consent was sought from each respondent. Moreover, anonymity was assured by use of unique identities assigned to the respondents.

Interviews were conducted in a language convenient for both interviewees and interviewers. Each interview was recorded using a tape recorder and a trained research assistant took notes. Field notes were counterchecked against recorded information immediately after each interview. In addition, the health care providers were given the opportunity to provide their views regarding the performance of the facility in implementing the adherence monitoring system for patients on ART. This was done using the SWOT exercise facilitated by the research team leader. The participants were the core team that participated in the study, comprising the following staff: pharmacy, nursing, nurse counsellor, clinical, health information and social worker. The participants were given the SWOT tool for self-assessment, after which a feedback session was held to summarise and discuss the various views as expressed by the team members. In particular, the participants were asked to describe what made them perform well (strengths), what hindered their performance (weaknesses), what they perceived to be motivating factors that would provide a conducive environment for better performance (opportunities), and, lastly, to identify external factors (threats) that could potentially hinder their performance.

All data recorded during interviews was transcribed prior to analysis. Notes taken by a research assistant during the interviews were used for clarification. All interviews were translated into English. The data was stored and managed using NVivo 8 (QSR International). Preliminary analysis entailed open coding and progressive categorisation of issues based on inductive and deductive approaches (21). The analysis focused on describing the perceived, reported and observed outcomes in relation to the use of the intervention tools; the staff members' ability to calculate appointment keeping indicators; as well as the perceived benefits of the training and supportive supervision on the health workers' performance.

We used three key dimensions (context, content and process), described by Pettigrew and Whipp (22). We analyzed the whole implementation process, in order to describe; 1) the motivation that led to acceptability and receptivity of the intervention (the context) 2) the changes that were implemented and the perceived effects (the content) 3) how the intervention was implemented and how strategies were used to bring about change in performance at the health facilities (the process). The context (the why) included both internal and external factors that affected the implementation of the intervention. The content (the what) focused on the assessment of choice, objectives and assumptions. The process (the how) entailed assessing the change management, models of change and implementation patterns over time. Table 1 illustrates how we applied the Pettigrew and Whipp framework to answer the research questions in relation to the three key dimensions.

The results are based on thematic areas categorised by the perceived impact of the intervention in line with the suggested dimensions of context, content and process. The quotations are picked in line with the three areas outlined above and seek to answer the questions – why, what and how in line with Pettigrew and Whipp model.

Ethical considerations: Ethical approval to conduct the study was granted by the Kenyatta National Hospital Ethics and Research Committee. Each interviewee was provided with a consent form to be read and signed prior to the interview. In addition, consent was also sought from all interviewees before any audio recording.

Table 1
Components for analysis of healthcare workers' perceptions of the implementation process

Essential dimensions*	Attributing factors for implementation of the intervention	Specific questions
Why (Context) Why did the facilities wish to implement the adherence monitoring intervention?	• Existing system for appointment keeping and monitoring on patient clinic attendance • Opportunity to identify patients who miss their appointments • Possibility to measure workload during clinic days in advance • Supportive organizational structures and key people leading change	What was the motivation for change: • Why did facilities want to implement the appointment-keeping tool? • Why did staff engage in generating indicators of adherence? • What enabling or hindering factors influenced staff's motivation to change over time (internal and external environment)?
What (Content) What changes were made relative to key contextual elements to enable implementation of the intervention	• Staff's competence to use the tools effectively • Capability to calculate the appointment-keeping indicators every month • Use of generated indicators to monitor adherence performance and track defaulters • Supportive organizational structures and key people leading change	What was the content of the change at the project level: • What changes were made to facilitate use of the new tools in a consistent way? • Were there any changes in facility routines, for example the organizational structure, roles of staff, routine procedures, to support and sustain the intervention
How (Process) How was the implementation carried out?	• Training of facility staff • Comprehensive introduction of the tools and continued provision • On-going supervision to support the implementation • Supportive organisational structures and key people leading change	What processes were used to enhance the targeted change for individual staff and facilities? • What implementation strategies were used to encourage adoption of change during the intervention? • How did the health care providers perceive the implementation process?

*Sources: (22,28)

RESULTS

In the evaluation of the intervention process we focused on six areas with particular relevance for the implementation: 1) Use of the diary to monitor appointment keeping; 2) Calculation of appointment keeping indicators; 3) Use of the form MoH 257, including the new question about adherence; 4) The introductory training; 5) Supportive supervisory visits and; 6) Facility staff meetings at the clinic. Findings related to these six areas will be presented as appropriate under each of the main headings below. Quotations have been selected from the transcriptions in order to illustrate some of these areas.

Context (the Why): Prior to the intervention, the facilities did not have a system to monitor appointment keeping for their patients. The intervention tools were therefore perceived by facility staff to create an opportunity for their own empowerment, and to increase their own capability to strengthen the monitoring system to improve adherence. The diary provided a system that enhanced monitoring of appointment keeping at the clinic. External factors that contributed to positive uptake of the intervention over time, included the availability of tools, training of the health care workers on basic principles of adherence and the support from the research team through supportive supervisory visits, while internal factors included management support and human resources, as some staff members pointed out:

"Initially we used to see patients and fill the ART register and take back the files and forget it. Now that we have this diary, every time we go through the diary we can know the patients who have not come who did not turn up for the clinic. Initially I used to go back to the cabinets, retrieve the files one by one so that I can know who defaulted who has not come, for the appointments but now …. I pass through the diary and know this patient did not turn up" (Clinician).

The health care workers perceived availability of longitudinal information for patients as a useful factor that enhanced the ability to monitor the patients' appointment keeping trends, which had not been possible before. Health care workers were more likely to know both the expected total number of patients on a certain day and in addition each individual's identity. This made it possible to plan for the workload and to trace patients who missed appointments, as was expressed in the following quotes:

"Since we started using the diary we have been able to monitor the client and we know when to expect the client to come so we can monitor them and know when each is coming and also the number of clients we expect in a day" (Clinical officer)

"We look at the records and establish who failed to turn up during the month, we trace their homes (from the available details) and we go right to their homes" (Nurse).

Content (the What): The intervention provided relevant tools that were to be used to monitor facility performance in achieving adherence for patients on ART. These new monitoring tools were perceived as easy to use, and the facility staff felt empowered to generate information that enabled them to make decisions to improve the quality of care for their patients. The self-report question included in the revised patient card (MOH 257), was perceived as a facilitator for the health worker to adopt a more focused approach as explained by the following quote:

"The old one (MOH 257 card) had personnel thinking on what to ask the patient while the new one is precise, i.e. "have you missed pills in the last 3 days" (Clinician)

"We used to do a lot of talking and waste a lot of time but after training it narrowed our ideas to important points hence saving a lot of time even to patients" (Clinical Officer)

The tools also enhanced the interaction between the health care provider and the patient, consequently making monitoring of adherence for patients more focused and targeted. The outcome was experienced as improved adherence by patients and a stronger organizational structure at the facility to provide quality care for patients on ART.

In addition, the facilities were able to gather information that was used to make decisions regarding policy on their appointment keeping. As an example, one facility adopted a strict appointment-keeping system to ensure that patients scheduled to come on a particular day were attended to first. These changes resulted in improved efficiency in provision of care for the patients and deterred patients from coming to the clinic at will, thereby decongesting the clinic area as described by one clinician:

"If you come on a day that is not your appointment date, you are not supposed to be seen if there is no good reason, expect to be seen last" (Clinical Officer)

The design of the intervention supported the facilities to improve their record keeping as described herein:

"The good side is that since we started (the intervention) our filing of patients' records has improved. Previously we used to lose a lot of files and there was a lot of mix up but now we have been able to arrange ourselves and also it has improved the clinic attendance of our patients" (Clinical Officer)

The introduction and continuous availability of tools for the implementation of the intervention were perceived as enabling factors. However, during the initial supervisory visit by the study team, the need of supplementing the longitudinal diary with a one page per day lay-out to provide for the scheduling of patients by their appointment date was identified. This helped health workers detect defaulters at an earlier stage than was previously the case.

The introductory training and continued support also enabled facilities to calculate appointment-keeping indicators derived from the clinic attendance register every month and use these indicators to inform discussions at the CCC. The indicators provided a basis to assess staff performance and monitor progress at the monthly review meetings. These meetings were perceived as much more useful when this kind of material was available and contributed to raising motivation for change and improvement among staff.

Process (the How): Training on basic adherence was perceived positively by providers and managers, with most of them stating that they were in dire need of training on this particular area. It was highlighted how the training contributed to improve the management of patient records and ways to handle patients who were struggling with adherence problems. One provider describes it as follows:

"I can say it (the training) was an eye opener because it expanded my knowledge on the importance of adherence and I didn't have much knowledge of clients taking the drugs and the importance of coming to the clinic regularly." (Nurse counselor)

Generally, most health workers reported that the tools were highly useful as information was collected that enabled them to make better decisions when handling patients and giving advice on adherence practice. One of the nurses said that:

"It can remind us how the client has been performing…. if the adherence has been poor you can tell… Because every time one comes (to the doctor) … their adherence status is written on the day they come, whether it was good or bad. Maybe even if the patient had experienced a problem – like if he got sick, the white card (MoH 257) shows what the doctor has written. (Nurse)

Providers perceived the diary as useful in determining who turned up for appointment. It was generally perceived to be easy to use; however, constraints of human resources were identified as challenges that could affect effective implementation. Staff attitudes were also identified as a motivational factor to the success of the intervention as explained below:

"The impact has been great, on the patients and the staff. And also when the patient has to come every month we are able to monitor them, so when the patient comes and he doesn't know his status we are able to know by consulting with the diary…. The impact has been there partly because of the diary and partly because of the staff attitude" (Nurse counselor)

It was observed that the process had generally

improved quality of care given to clients, as they were able to identify with the positive outcomes.

"At least it shows that something is positive, even if they don't keep the appointment so strictly they normally have a reason as to why they did not come, so I think the strategies are beginning to show improvement" (Nurse counselor)

The perceived benefits of the three supportive supervisory visits were described as follows:

"They did support us. They used to come when we had a problem previously with filling the form but when they came they showed us the way it was to be done and also calculating the indicators which we had a problem with, they really helped us" (Clinical Officer)

Perceived impact of the intervention: From the health care providers' perspective the immediate positive impacts were the outcome of the training sessions, the usefulness of the intervention tools, and the supervisory support. The strengths of the intervention were perceived to be around three key aspects: a) ability to identify patients who missed their appointment (defaulters) and track them; b) availability of commodities and tools for data collection; and c) good teamwork and leadership. Facility staff meetings at the clinic were identified as a key issue in ensuring teamwork in relation to making decisions regarding performance.

DISCUSSION

The perceived effective use of the intervention tools, and the ability to generate appointment-keeping indicators and use the data for making decisions regarding defaulters appeared as key motivational factors during the implementation process. The revised MoH 257 card was perceived as a tool that made it possible to provide focused counseling to patients who had missed their pills, and that this process was facilitated by the training in basic adherence concepts and the supportive supervision provided by the research team. It has been concluded previously that availability of good quality data from routine clinic work is imperative to ensure generation of up-to-date information, critical in strengthening adherence monitoring and improving health systems as a whole and performance and quality in particular (15,16,23). This kind of approach, with introduction of easy-to-use tools tailored to address local needs, has been seen to facilitate uptake of interventions in other contexts (24-26).

Consistency of appointment keeping has been found to correlate with good clinical outcomes (15,16). One of the benefits of the intervention was the ability of the health facilities to generate a list of patients that were scheduled to attend the clinic on a specific day, which enabled clinics to cope with the workload and make changes in daily operations. This, in turn, led to the decongestion of the clinic resulting in improved adherence to scheduled appointment dates.

Single interventions to improve health worker performance are usually not as effective as multifaceted interventions, such as including training and supervision (26). Findings from our study supports that a well-designed intervention, that involves both providers and research team throughout the whole implementation process, can provide an enabling environment for the facility management and staff at the CCC to improve performance in management of clinic attendance for patients. The involvement of the facility staff in the process of planning and implementation of an intervention can be a motivational factor and most possibly contributed to the positive uptake of the intervention in our study, which has also been shown previously (27).

The use of the Pettigrew and Whipp model of change (22) was valuable in guiding the analytical process of identifying facilitating and hindering factors during the implementation of the intervention (28,29). Pettigrew and Whipp have emphasised the importance of interaction between the context, the content, and the process for a positive change to occur. This interaction was clearly observed in our study also. The reasons for the facilities and individual providers to engage in change operations (the Why) was for example influenced by adding a sheet for daily diaries (the What), which introduced new information that was discussed during the CCC meetings (the How) and led to improved practice performance.

The support that the health workers received from the team in terms of supervision was another important factor in order to enhance working relationships. Support from the leadership was important as well, which has been shown previously (23-26), as has the positive impact of regular supervision on performance of staff and improved quality of care (30,31). Moreover, follow-up reinforcement visits seems to increase the effects of training during an intervention (31).

The results of the quantitative part of the study showed increased appointment-keeping rates and reduced medication gaps for patients (20). The increase in percentage of patients attending clinic on or before scheduled appointment (20), could also be attributed to the perceived benefits by the health care providers to monitor their performance and help improve adherence of their patients. Greenhalgh et al have provided evidence that success is likely to be experienced if the potential users see it as relevant in addressing felt problems and have room to modify the innovation to suit their needs (31).

One of the limitations of this study was in the data collection process, which required the participant to set aside some time out of their busy clinic work for the semi-structured interview. As in most resource-limited settings, the CCCs were understaffed and normally had a heavy workload, mostly during

morning's hours. Consequently, the interviews were to be conducted at the time when the clinic was less busy. This could have affected the quality of data collection.

Another limitation is that the views provided by the healthcare providers are their own perceptions, and may be influenced by a wish to provide a positive view. However, the interviewer made continuous efforts to reduce the influence of any such bias, by promoting the respondent to speak freely and by avoiding any kind of overt judgments.

Another potential limitation is that the intervention itself had a quasi-experimental design. This may have influenced the outcomes in terms of the quantitative measurements as mentioned above. However, it is not likely that it would have influenced the staff's perceptions of the implementation as such, as the interviews were performed only at the end of the implementation period, and just asked for the participants' own experiences and not their assessment of levels of improvement or change.

In conclusion, effective implementation was facilitated by availability of tools, supportive supervision follow-up communication to support the facilities, combined with capacity building of the health care workers and supporting interdisciplinary interaction at clinic meetings.

The views and perceptions of participants should be taken into consideration during the implementation of interventions to improve performance. It is also essential to impart relevant skills and provide the necessary tools for use during the implementation of the intervention. In addition, supportive supervision is also beneficial to ensure success of uptake of an intervention.

This pilot study provides an opportunity for further work in instituting mechanisms to build capacity for health systems strengthening at facility level using data for decision making for performance improvement.

We suggest that initial external support and adaptation to local contexts should be considered and that continued staff satisfaction with progress should be supported for successful implementation of future large-scale interventions at facility level.

COMPETING INTERESTS

The authors declare that they have no competing interests.

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