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An evaluation of the impact of a community-based adherence support programme on ART outcomes in selected government HIV treatment sites in South Africa

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This study assessed the impact of a community-based adherence support service on the outcomes of patients on antiretroviral therapy (ART). The evaluation was a retrospective study based on patient clinical records. This study noted that a significantly higher proportion of patients with a community-based adherence supporter (also known as a patient advocate, PA) had viral load (VL) of less than 400 copies/ml at six months of treatment (70%, \( p < 0.001 \)); a significantly higher proportion of patients with PAs (89%) attained a treatment pickup rate of over 95% (67%; \( p = 0.021 \)). Patients at health facilities with PA services maintained a suppressed VL for a longer period as opposed to patients at health facilities without PA services (\( p = 0.001 \)), also patients at health facilities with PA services remained in care for longer periods (\( p = 0.001 \)). Therefore, the study concludes that integrated community-based adherence support is crucial in ensuring that patients remain in care, regularly pickup their treatment from ART clinics and are virologically suppressed. The study also underscores the importance of access to health services and the presence of an enabling environment in the treatment of AIDS.

Keywords: adherence; AIDS; antiretroviral therapy (ART); community-based support; HIV; patient advocates (PA)

Background

Ensuring optimum adherence to antiretroviral therapy (ART) is a high priority for effective HIV/AIDS management. The optimal use of ART has been shown to result in dramatic reductions in mortality and morbidity among persons living with HIV and AIDS (Palella et al., 2003; Walmsley et al., 2002). It has also been demonstrated that poor adherence is a major predictor of progression to AIDS and death (Bangsberg et al., 2001; Garcia et al., 2002; Hogg et al., 2002). The stark levels of virologic failures (+50%) noted in ART programmes have been attributed to various factors including the suboptimal adherence to treatment (Battaglioli-DeNero, 2007; Chesney, 2003; Knobel, Guelar, & Carmona, 2001; Lichtenstein, 2005; Liu, Golin, & Miller, 2001). In view of these concerns, a community-based adherence support programme provided through adherence supporters (also known as patient advocates, PAs) was designed and implemented to ensure that patients optimally adhere to treatment. This intervention is based on studies that have demonstrated that continued treatment, counselling and psycho-social support improves adherence to treatment (Chesney, 2003). PAs are the link between clinical services and the community and are trained in the elements of health promotion, ethics, confidentiality, HIV, AIDS and related diseases, treatment and adherence support skills and knowledge. The key services provided by PAs are: psycho-social assessments to identify barriers to adherence; pre-treatment initiation education to promote adherence; and plan adherence support services to suit individual client needs through planned home visits and follow-ups. PA support services are made available to all patients on treatment in the health facilities with PA services. Some patients reject this service because they have not disclosed their HIV status to their families and hence are not willing to be visited by PAs (who are known in the community as HIV/AIDS care programme supporters).

This study therefore sought to establish the extent of impact of PA support on patient retention in care, adherence to ART and clinical treatment outcomes. Analysis was done at two levels. The first was patient-level analysis that compared the study variables among patients exposed and not exposed to PA services at ART sites. The second was site-level...
analysis that compared patient outcomes at sites with and without PA services.

**Methodology**

The study was retrospective based on patient record review and located at the health facilities with PA services. The study methodology is presented at two levels of analyses.

**Patient-level analysis**

The patient-level analysis sites were selected according to patient enrolment rates, PA coverage and quality of patient records. Sites with higher patient enrolment rates, better data quality and sites with comparable proportions of clients with and without PAs were selected. Four study sites were selected from three provinces. That is, one site each from two provinces and two sites from the third province. The study targeted patients who were initiated to ART between July and September of 2007.

The spectrum of elements extracted from the database included patients’ PA support status; ratio of clinical care workers to total onsite patients on ART; patient use of other adherence support measures like clinic-based lay counsellors; history of missed-clinic-appointments; treatment pickup rate; patient retention status and viral load (VL). Correlations were conducted to establish the associations between variables. The variables were compared between patients with and without PA support. Chi-square test and the student t-test were used to compare rates of patient retention status, missed appointments and treatment pickup rates between the two groups of patients.

**Site-level analysis**

The site-level analysis used patient records from ART sites with \( (n = 12) \) and without \( (n = 14) \) PA services. Sites where ART services commenced before PA support was introduced were excluded because of the longitudinal nature of the site-level analysis. The analysis included all patient records where VL test results were available. Survival time was taken as the difference between patients’ most recent pharmacy visit date for medication pickup and the ART start date. The analysis compared the optimum time patients remained in care at sites with and without PA services. Ethical clearance for this study was granted by an ethical review board at the University of Cape Town.

**Findings**

**Patient demographic information distribution by key variables**

Over 540 patient records were used for patient-level analysis and the average treatment duration of the patients was about nine months. 17, 46 and 37% of the patient records were from the sites in three respective provinces that participated in the study. PA—patient distribution across the selected sites was noted to be significantly different \( (p = 0.001) \). The majority of the patients were female (64%), persons aged between 25 and 39 years old (59%), persons supported by adherence supporters (56%) and patients who lived within a 9 km radius from the health facility (58%). A higher proportion of the patients had been exposed to clinic-based adherence counseling (66%). HIV disclosure rate was high (96%) and 47% of the patients had disclosed their HIV status to one person only; 18% disclosed to two people and about 32% had disclosed to more than three people. But 25% \( (n = 125) \) of the study participants were neither being supported by a PA nor by a clinic-based counsellor. The majority (82%) of this study cohort remained in care, compared to the proportion of patients who were lost to follow-up (LTF; 12%), transferred (4%) and died (3%).

**Relationship between adherence supporter exposure and key study variables**

Table 1 contains the distribution of study variables by exposure to PA. Patients who resided more than 40 km from the health facilities were significantly less likely to have a PA (Table 1). As an indicator of economic standing, PAs were significantly more likely to be allocated to patients who lived in shacks and traditional houses (75%) when compared to those who lived in modern houses (25%). Patients with PAs were more likely to disclose their HIV status (58%) when compared to the proportion of patients without PAs who disclosed their HIV status (42%; \( p = 0.005 \)). Patients with PAs were also significantly more likely to be receiving clinic-based counselling. A significantly higher proportion of patients with PAs had VLs of less than 400 copies/ml at six months (70%, \( p = 0.001 \)). Patients with VLs greater than 400 copies/ml at 6 months were slightly higher among patients with PAs (51%, \( p = 0.001 \)). When comparing the frequency of viral suppression among patients with and without PAs, respectively, the proportion of patients with unsuppressed VLs at 6 months was higher among those without PAs (42%) when compared to the frequency of unsuppressed VLs among patients with PAs (24%; \( p > 0.001 \)).
Relationship between treatment pickup rates and patient characteristics

The average treatment pickup rate was 99.0% (SD = 10.3; median = 101.0; 95% CI = 96.4–101.0) and the average missed appointments were 11.4 days (SD = 22.2; 95% CI = 6.8–16.0). The treatment pickup rate was significantly higher among patients with VLs less than 400 copies/ml (100.3%) when compared to patients with VLs equal to or greater than 400 copies/ml (91%; \( p = 0.001 \)). The number of days between scheduled medicine pickup date and actual medicine pickup date was significantly more among patients with unsuppressed VL (30.1 days) when compared to the number of missed days among patients with suppressed VL (16.0 days; \( p = 0.001 \)).

The treatment pickup rate showed that 78% of the participants attained a 95% pickup rate while 22% did not. The 95% benchmark is in line with the commonly cited global requirement for optimum adherence to ART. In addition, about half of those who did not attain the 95% treatment pickup rate experienced virologic failure, while 17% of those who achieved the 95% treatment pickup rate experienced virologic failure (\( \chi^2 = 6.558; p = 0.010 \)). Despite these figures, a significantly higher proportion of patients with PAs (89%) attained a treatment pickup rate of over 95% when compared to the proportion of patients without PAs who achieved the 95% pickup rate (67%; \( \chi^2 = 6.131; p = 0.021 \)).

Impact of patient advocate (PA) services on the rate of virologic failure

The median time in which patients at sites with PA services maintained a suppressed VL was 235 days, while the median time in which patients at sites...
without PA services maintained a suppressed VL was 199 days ($\chi^2 = 143.46; p = 0.001$).

Since the hazard ratio of not having a suppressed VL was less than 1 (0.64), it means that an unsuppressed VL is less likely to occur among patients at sites with PA services as compared to its occurrence at sites without PA services (Table 2).

Impact of patient advocate (PA) services on patient retention

The median retention in care time for patients at sites with PA services was 561 days, while the median retention in care time for patients at sites without PA services was 455 days ($\chi^2 = 124.27; p = 0.001$). This finding shows that more patients at sites with PA services remained in care for a longer period in comparison to the median patient retention time at sites without PA services.

The hazard ratio was less than 1 (0.62) and this implies that non-retention in care (dying and LTF) is less likely to occur at sites with PA services when compared to its occurrence at sites without PA services (Table 3).

Limitations and strengths

The major limitation of this evaluation was its reliance on data extracted from a routine programme-monitoring database and not a database driven by a prospective research process. The use of this approach largely explains the exclusion of many poor quality variables which led to analytical limitations as well as the missing values within variables. Within the data limitations and adaptations, exposure to PAs was a dichotomous variable indicating whether a patient either had or did not have a PA. In other words, patients who may have interacted with PA support only once were grouped with patients who have had repeated PA contacts. This level of measurement is, however, consistent with the requirements to answer the key evaluation question which was to indicate whether having a PA will result in optimum adherence to ART. The database developed for this study represents a modest set of variables that will allow a technically feasible quantitative analysis of the impact of the community adherence support programme. Ultimately, the site analysis provides better discrimination of patients exposed and not exposed to PAs.

Discussion

Adherence in this study was measured using the patient treatment pickup rate as a process indicator. The treatment pickup rate is analogous to the pharmacy refill data, which is defined as (pills dispensed/pills prescribed per day)/(days between refills) $\times 100\%$ (Grossberg, Zhang, & Gross, 2004). This measure has been widely validated and used as a proxy measure of adherence to ART (Grossberg and Gross, 2007; Grossberg et al., 2004; Wood et al., 2003). Similar to other studies, this study noted that treatment pickup rate was significantly higher among persons with suppressed VL, while missed appointment rate was lower among persons with unsuppressed VL. Studies that have linked treatment pickup rate and adherence have described it as simple, inexpensive and a valid proxy measure of adherence to ART (Grossberg and Gross, 2007).

The reported average treatment pickup rate of 99% represents an unusually high level of adherence considering that 50% of the patients (with treatment pickup data) were not being support by a PA. This finding is predicated on the fact that similar studies have reported such high levels of adherence only among patients receiving active adherence support interventions. For instance, Tuldra et al. (2000) found that over 94% of patients in the adherence support intervention group maintained an adherence rate of $\geq 95\%$ as against the 64% of the control group that attained the $\geq 95\%$ adherence rate. The high treatment pickup rate noted from one of the evaluation

Table 2. Risk of virologic failure among patients at sites with and without PA services ($N = 3097$).

<table>
<thead>
<tr>
<th>PA status</th>
<th>Incidence rate of unsuppressed viral load</th>
<th>Hazard ratio</th>
<th>95% CI</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sites without PA ($n = 1958$)</td>
<td>0.003</td>
<td>0.64</td>
<td>0.585–0.693</td>
<td>0.001</td>
</tr>
<tr>
<td>Sites with PA ($n = 1139$)</td>
<td>0.002</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3. Risk of non-retention in care (dying and LTF) among patients at sites with and without PA services ($N = 2431$).

<table>
<thead>
<tr>
<th>PA status</th>
<th>Incidence rate of death or LTF</th>
<th>Hazard ratio</th>
<th>95% CI</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sites without PA ($n = 1544$)</td>
<td>0.0019032</td>
<td>0.62</td>
<td>0.620541–0.6757964</td>
<td>0.001</td>
</tr>
<tr>
<td>Sites with PA ($n = 887$)</td>
<td>0.0014310</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: LTF, lost to follow-up.
sites may be attributable to the fact that almost all the patients in this site (95%) and especially the patients without PAs (97%) had repeatedly seen a clinic-based adherence counsellor. It is, however, important to note that PAs often serve as clinic-based adherence counsellors due to a shortage or absence of such skills in the clinics. This finding is in consonance with similar studies that have noted the effect of such interventions in ensuring optimum adherence to ART (Golin et al., 2002).

It remains a concern that access to PAs or clinic-based adherence counsellors was widely uneven across the evaluation sites. In addition, approximately 25% of all the participants from the four sites were not being supported by a PA or clinic-based adherence counsellor. The concern with this gap is based on the notably higher virologic failures reported at sites with lesser PA coverage. This assertion is on the basis that the health facilities with significantly higher proportions of patients without any form of adherence support were also significantly more likely to have patients with unsuppressed VLs. Furthermore, a significantly high majority (70%) of patients with suppressed VL were patients who were supported by a PA and the chance of attaining a treatment pickup rate of ≥95% was higher among PA-supported patients. These findings support the need for adherence support as critical in HIV management.

The potential effects of patients’ proximity to health facilities were noted in this evaluation. Patients who lived closer to a health facility were significantly more likely to have a PA. Similarly, patients who lived closer to a health facility were more likely to have a suppressed VL. The suggested relationship between the likelihood of being supported by a PA and proximity to health facility is attributable to the fact that the PA support service is located in the same geographical area as the health facility. In the same manner, the health facilities are designed to cater for people in its immediate catchment area. But some HIV-infected patients prefer to access-related services at health facilities that are far from where they live because they fear to disclose their HIV status due to the stigma associated with it. This phenomenon makes it increasingly challenging to provide community-based adherence support to patients who live far from the health facility. Hence, patients who live far from the health facility may not be receiving adherence support despite its importance to ART outcome (Pradier et al., 2003; Rathbun, Farmer, & Stephens, 2004).

Another key objective of this study was to establish if exposure to PA support contributed to whether patients were LTF or remained in care. In this regard, the data from the patient-level analysis showed no significant difference between patients who were supported by a PA and those who were not. This finding should, however, be taken with caution due to the fact that having or not having a PA as measured in this evaluation is not enough to establish the impact of PA support on the likelihood of a patient remaining in care. The reliance on this level of categorisation was due to the limited information on frequency of patient exposure to PA support at the time of the study. This categorisation undermines the potential effect of the frequency of exposure to PA services on patient retention. In the context of this argument, this study shows that patients who had repeatedly seen a clinic-based adherence counsellor were significantly more likely to remain in care. The site-level analysis in this study provides a more credible comparison of the likelihood of patient retention in care and viral suppression between sites with and without PA services, with a marked significant difference between sites favouring with PA services. In summary, the two strands of analyses support the growing evidence that adherence support is relevant in promoting adherence to ART (Holzemer et al., 2006; Simoni, Frick, Pantalone, & Turner, 2003).

In all, this study strongly underscores the importance of having an integrated community adherence support strategy as part of the package of HIV management at the primary level of care. Thus, it is essential that all patients on ART be provided with access to adherence support services tailor made to suit unique patient socio-economic and demographic status and clinical condition.

References


Wood, E., Hogg, R.S., Yip, B., Harrigan, P.R., O’Shaughnessy, M.V., & Montaner, J.S. (2003). Effect of medication adherence on survival of HIV-infected adults who start highly active antiretroviral therapy when the CD4+ cell count is 0.200 to 0.350 × 10^9 cells/L. *Annals of Internal Medicine, 139*, 810–816.