ORIGINAL ARTICLE

Pharmacist's role in HIV care in France. Implication for clinical improvement of people living with HIV worldwide

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Abstract
In France, antiretroviral (ARV) treatment can be dispensed by hospital and/or community pharmacies. Since January 2016, an online patient medication file can be used to optimize dispensing, but medication interviews have not yet been incorporated into this system. To understand both people living with HIV (PLHIV) and their pharmacists’ habits and expectations of patient medication file and interviews, two consecutive national surveys were organized. The first one, carried out in October 2016 in care centers, was an anonymous questionnaire for PLHIV. The second one was an online survey for community and hospital pharmacies conducted in February 2017. A total of 1137 PLHIV (68% men, of mean age 50.2 ± 11.5 years, CD4 count 671 ± 354, 90% with undetectable HIV viral load (VL) and 64.2% reporting comorbidities) and 246 pharmacies responded. While the existence of the online medication file is known by 58% of PLHIV, only 40% of pharmacists declare it to be systematically offered. It was offered to 120/694 (17%) PLHIV and 96 (80%) accepted it. Currently, 78 (7%) PLHIV feel well taken care of because they are offered medication interviews, 343/1078 (32%) would like to take advantage of this program, mainly those with a shorter ARV duration (OR ARV duration 0.97 [0.95-0.99]), a VL less often undetectable (OR undetectable VL 0.55 [0.31-0.98]), and those who feel anxious more often (OR anxious 2.38 [1.48-3.84]). These results suggest that better implementation of medication files and interviews will strengthen current clinical pathways.

KEYWORDS
antiretrovirals, clinical pharmacy, health policy, HIV/AIDS, patient safety
1 | INTRODUCTION

In France in 2016, there were an estimated 6000 HIV new infections, leading to 172 700 people living with HIV (PLHIV), 76% of whom received antiretroviral (ARV) treatment.1 Pharmacists are responsible for dispensing medication optimally, in particular ARV drugs whose role in reducing transmission and halting progression toward AIDS is essential.2,3 In our country, HIV care is mainly hospital-centered while pharmaceutical care is not. If double dispensation (in hospitals and in community pharmacies) exists, 70% PLHIV prefer community pharmacy dispensing as France has a dense neighborhood network of pharmacies.4 However, relatively few ARVs are dispensed by each pharmacy each day. There is no remuneration in place for the pharmacist’s services to PLHIV even though ARV regimen can be complex, and can sometimes be combined with treatments for opportunistic infections and/or hepatitis B and C, and/or often with treatments for comorbidities associated with prolonged HIV infections (cardiologic, metabolic, digestive, or neuropsychiatric) and very often with self-medication.5 These drugs require precise pharmacological analysis and management of drug interactions, with heightened pharmacovigilance.6 This is especially important because after the infection stabilizes, a current care pathway only require bi-annual or annual hospital consultations where an ARV prescription is given for the following 6 months, or year.7 During this 6-month or 12-month period, the pharmacist (hospital pharmacist or community pharmacist, according to the patient’s preference) is often the only health professional a PLHIV will meet monthly, and who must ensure adherence to the treatment regimen. Another major challenge for the pharmacist can be patient therapeutic education (PTE) in conjunction with the various actors involved. It is likely that PTE, despite being recommended in HIV care, is only infrequently offered by the hospital care actors or solicited by the patients: in our precedent study, specialized HIV care nurses provided therapeutic education to only 5% patients.4,6,7

Some other features of the French health system can complicate a patient’s care pathway, such as the coexistence of public and private care or the existence of private additional insurances. The coordination of care requires a complex collaborative effort to ensure the patients’ free circulation within the care system.

For cost-controlled medical care ("better care through better spending"), coordination of care and health actors has become essential. Thus, since January 2016, an online patient medication file can be used to favor optimal dispensing. When this file is offered by the pharmacist and accepted by a patient covered by health insurance, it can be used to record all the drugs dispensed during the previous 4 months (21 years for vaccines and 3 years for biological tests), whether they were prescribed by a general practitioner, another physician, or taken on a pharmacist’s advice. This file thus constitutes a tool for coordinating prescriptions, generating advice, and identifying precautions in use, all of which are of benefit to the patient.8 The pharmacist can also draw attention to the monitoring and pursuit of certain treatments such as oral anticoagulants and anti-asthmatic drugs, but not ARV drugs.9

Two surveys were organized. The first one, intended for PLHIV, was designed to find out more about their habits and their expectations of their pharmacist, to assess how well the medication file and medication interview were accepted, and to profile them. The second one, geared toward pharmacists, sought information about how ARV and/or other prescribed or self-prescribed medication drugs were being dispensed, how often the medication file and medication interviews were offered, the profiles of the pharmacies concerned, and, finally, the pharmacists’ readiness to conduct medication interviews on monthly dispensing of ARV drugs.

2 | MATERIALS AND METHODS

Our first national survey of PLHIV took place on the week of 12-18 October 2016. All centers which had been informed beforehand by the anti-HIV regional coordination task group (COREVIH), supervisors and the pharmacists’ branch of the Regional Union of Health Professionals (URPS), and which agreed to participate were recruited. All the consecutive PLHIV under ARV treatment admitted in clinical units or hospital pharmacies who agreed to participate were offered to answer the questionnaire, unless they were minors or under guardianship. Those who accepted answered anonymous self-questionnaires collecting demographic and medical data (the latter mostly comprised their biological results available on site), current dispensing patterns for all drugs, co-prescriptions and self-medication, their views on the medication file and medication interviews, and any requests they might have.

Our national survey of pharmacists took place during February 2017 for community and hospital pharmacies recruited by the pharmacists’ branch of the URPS, supervisors, and wholesale suppliers. The fully anonymous survey was conducted online; the pharmacies were questioned once only.

2.1 | Ethics

The study and the text of the survey were approved by the Clermont-Ferrand Ethical Review Board. The addresses of the participating centers were collected beforehand by the Clermont-Ferrand university hospital under the terms of the French National Commission for Data Protection and Liberties (CNIL) (N°0177- September 2016). All the questionnaires were anonymous.

2.2 | Statistics

All the analyses were carried out using Stata software (version 13, StataCorp, College Station, Texas) and R 3.3.3 software (http://cran.r-project.org/). All tests were two-sided with a type I error set at 0.05. The populations were described by numbers and associated percentages for categorical variables and by means ± standard deviation or median [interquartile range] for quantitative variables,
according to their statistical distribution (normality checked by the Shapiro-Wilk test).

The percentage of PLHIV who considered that the pharmacist dispensing the ARVs ought to offer medication interviews, and the percentage of PLHIV who would have accepted the medication file if it were offered are presented with a 95% confidence interval.

A multiple correspondence analysis (MCA) followed by a mixed unsupervised classification (k-means clustering applied to the partition obtained from an ascending hierarchical classification using Ward’s distance) was also implemented to (a) study the relations between the modalities of the variables and (b) determine PLHIV profiles (clusters of individuals sharing closely similar characteristics). For this analysis, the variables were chosen according to clinical relevance and to statistical distribution (parameters always present or always absent were not considered)—as age, gender, in work, ARV duration, ARN VIH, comorbidities, etc listed in Table 1. Only individuals without missing data were used for MCA.

This exploratory analysis was completed by comparing different groups of subjects (community vs hospital pharmacy to collect ARVs, acceptance vs refusal of interviews, etc) using usual inferential statistical tests: (a) Student’s t-test or Mann-Whitney test if the conditions for the t-test were not met (homoscedasticity checked by the Fisher-Snedecor test, and normality by the Shapiro-Wilk test) for quantitative variables, and (b) Chi-squared test or Fisher’s exact test as appropriate for categorical variables. Multivariate logistic regressions (for dichotomous-dependent variables) were performed considering the covariables in light of the results of univariate analysis and their clinical relevance (eg, gender, age, length of illness, and duration of treatment). The results are expressed as odds ratio (OR) and 95% confidence interval (CI).

3 | RESULTS

In all, 98 centers (68 hospital clinical units, 15 hospital pharmacies, and 15 community pharmacies) throughout France took part in the first survey. They saw 1213 PLHIV for either consultation or dispensing—between 1 and 77 patients per center. Of these, 57 patients refused to take part (too busy, not interested, and other reasons), and 19 others did not reply (reading difficulties). A total of 1137 PLHIV filled out a questionnaire (participation rate 94%).

In all, 246 pharmacies (38 hospital and 208 community) throughout France answered the online questionnaire in the second survey.

3.1 | Characteristics of the people living with HIV

The characteristics of PLHIV are shown in Table 1. They were on average 50.2 ± 11.5 years old and 68.3% were men. The viral load (VL) was mostly undetectable (89.7%) and 64.2% of PLHIV had an associated disorder.

A MCA was carried out on the 625 PLHIV with no missing data. The characteristics of the people excluded from the MCA were similar to those who took part except that they were more often female (180/509 (35.4%) excluded vs 179/625 (28.6%) included, P = .02) and lived more often outside the Île-de-France region, French overseas departments and the Provence-Alpes-Côte-d’Azur region (236/364 (64.8%) excluded vs 329/625 (52.6%) included, P < .001). The MCA and the mixed unsupervised classification highlighted three clusters of PLHIV (Figure 1). In the first cluster (n = 373; 59.6%), PLHIV were characterized by the absence of any health problem other than HIV (no high cholesterol, sleeping difficulties, anxiety, digestive problems, hypertension, pain, tiredness, heart problems, or diabetes). In addition, 77% of individuals aged below 50 years, 73% of those in work, and 79% of those receiving ARVs for less than 6 years belong to this cluster. This first cluster thus comprised mostly "young working" individuals. Those in the second cluster (n = 137; 22.0%) were people aged over 50 years, with no sleeping difficulties, tiredness, or anxiety, and were mostly male (85%). They presented risk factors and/or cardiovascular diseases: 90% of the diabetics were in this group, along with 75% of those with high cholesterol, 60%

### TABLE 1 Sociodemographic and medical characteristics of the people living with HIV (PLHIV) included

| Demographic characteristics | N   | n (%)  |
|-----------------------------|-----|-------|
| Male gender                 | 1134| 775   |
| Age (years)                 | 1112| 50.2  |
| Lives in IDF/DOM/PACA \(a\) | 989 | 424   |
| Lives in town               | 1098| 859   |
| In work                     | 1111| 613   |
| Lives with partner          | 1113| 491   |

HIV infection and treatment

| Duration of antiretroviral treatment (years) | N   | 11.9 ± 8.2 |
|--------------------------------------------|-----|------------|
| CD4 count                                  | 874 | 671 ± 354  |
| Undetectable viral load                    | 920 | 825 ± 89.7 |

Care of associated disorders

| Associated disorder                        | N   | 724   |
|-------------------------------------------|-----|-------|
| Hypertension                              | 724 | 205   |
| High cholesterol                          | 724 | 182   |
| Diabetes                                  | 724 | 73    |
| Heart problems                            | 724 | 109   |
| Sleeping difficulties                     | 724 | 180   |
| Anxiety, stress                           | 724 | 207   |
| Tiredness                                 | 724 | 126   |
| Digestive problems                        | 724 | 140   |
| Pain                                      | 724 | 223   |
| Other health disorders                     | 724 | 1     |

\(a\) Standard deviation.

\(b\) Île-de-France Region/overseas departments/Provence-Alpes-Côte-d’Azur Region

\(c\) Human immunodeficiency virus.
Cluster 1 per day. Very few had problem with ARV dispensation. One employee, and dispensed in urban area less than 150 patients collected their ARVs in a hospital pharmacy, 729 (64.6%) in a community pharmacy, and 81 (7.2%) in one or the other indifferently. More PLHIV belonging to clusters 1 and 2 collected exclusively their ARV in a hospital pharmacy than cluster 3 (26.0%, 25.5%, and 15.7%, respectively, P = .02). We could specify by multivariate analysis the factors associated with strict hospital dispensing to be female sex (OR male 0.62 [0.40-0.96], P = .03), greater age (OR 1.03 [1.01-1.05], P = .02), employed (OR job 1.76 [1.14-2.74], P = .01), and suffering less frequent anxiety (OR anxiety 0.45 [0.25-0.83], P = .01). For the 787 PLHIV who went sometimes or always to a community pharmacy, this was their usual pharmacy in 689 cases (87.5%). No particular sociodemographic or medical characteristics such as HIV VL or CD4 cell count could be identified.

In all, 1108 respondents evaluated the current dispensing of their ARVs. In terms of the different response choices offered, 729 (65.8%) felt well cared for because the dispensing was confidential, 541 (48.8%) because the stock of ARVs was sufficient so they did not have to come back several times, and 78 (7.0%) because “medication advice” was offered to them. Although there was no relationship with one of the three clusters of patients, these last 78 respondents went less often to community pharmacists for their ARVs (OR community 0.38 [0.17-0.84], P = .02) and lived less often with a partner (OR partner 0.47 [0.22-0.99], P = .047). For 96/1108 PLHIV (8.7%), close proximity, attentiveness, and the management of drug interactions were also important variables.

In addition, of these 1108 PLHIV, 7.0% considered that their pharmacist could help with their compliance—mostly those who were unemployed (OR job 0.52 [0.28-0.95], P = .04)– 4.5% with their unwanted side effects—mostly those who were anxious (OR anxiety 2.46 [0.03-5.85], P = .04) and unemployed (OR job 0.20 [0.07-0.52], P = .001)– and 5.3% with their drug interactions—mostly those who were anxious (OR 8.03 [3.32-19.40], P < .001). Moreover, 9.6% of the third cluster considered that their pharmacist could help them manage their drug interactions vs 1.1% and 1.5% in clusters 1 and 2, P < .001.

3.4 | The medication file

While 475/1137 PLHIV (41.8%, 95% CI: 38.9 to 44.7%) had never heard of the medication file, they were offered by a pharmacist to only 120/694 of them (17.3%, 95% CI: 14.4 to 20.2%), and accepted by 96/120 (80.0%, 95% CI: 72.7 to 87.3%). No relationship with the different clusters of patients was found (see Table 3).

Interestingly, the community pharmacies answered that 70/177 (39.5%) offered it systematically.

3.5 | Future medication interviews

When PLHIV were asked whether they would be interested in interviews with their pharmacists during ARVs dispensing, where they could receive explanations about efficacy and tolerance, recommendations for proper use of their medication, and advice about

FIGURE 1 Modalities of the variables (A) and position of the individuals (B) on the two first axes resulting from the multiple correspondence analysis (MCA). A, The relationships between the categories of the variables can be interpreted as follows: categories with a similar profile are closed to each other, negatively correlated categories are positioned on opposite sides of the chart’s origin, the distance between categories and origin measures the quality of the categories (distant points from the origin are well represented by the MCA). B, Factorial analysis revealed three profiles of PLHIV. AG_N: age ≤ 50, AG_O: age > 50, AN_N: no anxiety disorders/stress, AN_O: anxiety disorders/stress, ARV_A: ARV duration ≤ 6 years, ARV_B: ARV duration between 7 and 17 years, ARV_C: ARV duration > 18 years, AU_N: no other disorder, AU_O: other disorders, CA_N: no heart problems, CA_O: heart problems, CD4_N: CD4 ≤ 500, CD4_O: CD4 > 500, CH_N: no cholesterol, CH_O: cholesterol, CO_N: do not live in a relationship, CO_O: lives in a relationship, DIA_N: no diabetes, DIA_O: diabetes, DIG_N: no digestive problem, DIG_O: digestive problems, DO_N: no pain, DO_O: pain, FA_N: no fatigue, FA_O: fatigue, H: men, HY_N: no high blood pressure, HY_O: high blood pressure, IDP_N: do not live in Ile-de-France, DOM or Provence-Alpes-Côte d’Azur, IDP_O: lives in Ile-de-France, DOM or Provence-Alpes-Côte d’Azur, IN_N: detectable viral load, IN_O: undetectable viral load, SO_N: no sleeping troubles, SO_O: sleeping troubles, TR_N: nonworking, TR_O: working, VI_N: do not live in town, VI_O: lives in town

3.2 | Characteristics of the pharmacies and dispensing by pharmacists

The characteristics of the pharmacies that responded to the second survey are given in Table 2. Majority were 43.8 years old female, had one employee, and dispensed in urban area less than 150 patients per day. Very few had problem with ARV dispensation.

3.3 | Dispensation as experienced by the PLHIV

Of the 1128 PLHIV who answered this questionnaire, 318 (28.2%) collected their ARVs in a hospital pharmacy, 729 (64.6%) in a...
any drug interactions, 1078 responded (see Table 4). All in all 343 could accept interviews ans 735 couldn’t. Bearing in mind that several answers were possible per respondent, 233 (21.6%) would agree to interviews to improve their knowledge and therefore help them manage their anti-HIV treatment, 204 (18.9%) would have participated to improve their follow-up and compliance, and 140 (13.0%) to improve their relation with their pharmacist. However, 549 (50.9%) PLHIV were not interested, and 125 (11.6%) did not have time. The others didn’t specify any reason.

Focusing on the 343/1078 (31.8%) people who would have agreed to interviews for medical reasons (knowledge, management of treatment, and/or follow-up), they were mostly PLHIV belonging to cluster 3 rather than clusters 1 and 2 (39.8%, 24.9%, and 28.5%, respectively, $P = .008$), with a shorter ARV treatment history (OR duration ARV 0.97 [0.95-0.99], $P = .04$), a less frequently undetectable VL (OR undetectable VL 0.55 [0.31-0.98], $P = .04$), and anxiety-prone (OR anxiety 2.38 [1.48-3.84], $P < .001$). The PLHIV wanting to improve their relation with their pharmacist showed no particular sociodemographic or medical characteristics. The PLHIV who were not interested in interviews belonged more often to clusters 1 and 2 than 3 (68.9%, 59.2%, and 51.3%, respectively, $P = .008$), and were less anxiety-prone (OR anxiety 0.47 [0.29-0.75], $P = .001$).

Of the community pharmacists participating, 142/172 (82.6%) found that establishing medication interviews was important, and 74/136 (54.4%) thought it should encompass all PLHIV (Table 4). On the other hand, 62/136 respondents, 45 (72.6%) wanted interviews to be set up only in cases of a recent HIV diagnosis, 29 (46.8%) when other medications are being taken, 26 (41.9%) to allay patient anxiety, and 25 (40.3%) when self-medication was practiced.

Among the topics that patients would have liked to address, according to the pharmacists, the most important was the management of unwanted side effects, forgotten doses, noncompliance, and drug interactions. To deal with these topics, more training would be necessary according to 94% of the pharmacists, mainly through continuous training programs (68%), above all centered on patient
by the pharmacists themselves. To set up these interviews, the pharmacists wanted additional training, mainly oriented toward support and global care of PLHIV.

Certainly, centers and pharmacies were volunteer-recruited and this is the main limitation of the study. The centers and pharmacies involved were probably already interested in the subject. However, the number of centers and pharmacies, their different sizes, and their geographic location throughout the French territory could overcome a part of this recruitment bias. Moreover, the "in a given week" survey methodology with a 94% patient participation rate compensated for the selection bias of PLHIV. Besides, the characteristics of the PLHIV in this study seem to be the same as those of the PLHIV in the French hospital database on HIV infection (FHDH), with a sex ratio of 2/3 men due to the epidemic among MSM in our country. Precisely, in 2016 in France, median age of PLHIV was 49.9 years old [IQR: 41.6-56.9], 65.4% were male and 61.2% were born in France, 89.7% had undetectable VL, and 68% had CD4 cell count > 500 mm³.10 Thus, PLHIV recruited can be considered representative of the French PLHIV population. However, they seem to present more numerous comorbidities than those previously reported.1,7 Though, as we noted in the present study, our self-questionnaire focused more closely on "disorders" than on identified organ diseases. Nevertheless, the HIV Outpatient Study (HOPS) had already emphasized the high percentage of people receiving prescribed medication associated with the ARV treatment for comorbidities linked to aging, anxiodepressive syndromes imperfectly diagnosed by HIV specialists (reported by the Vespa 2 study in France), or probable self-medication for unwanted side effects and ill-defined symptoms (pain, anxiety, and digestive disorders), such as NSAIDs and PPIs, with undesirable side effects and deleterious interactions with ARVs.11,12 Our findings might comfort these characteristics without metabolic or cardiovascular comorbidities but anxiety, tiredness, and sleeping difficulties are displayed in group 3 and represents around 18.4% of PLHIV. All in all, multiple medication is more frequent than in the general population, and can be associated with poor compliance, which would justify specific therapeutic interviews.13,14 Furthermore, even if this survey took place in 2016 and 2017, the situation with respect to pharmaceutical care for PLHIV is still the same in France.

Our results are in line with those of several recent studies that found ARVs were dispensed mostly in community pharmacies and in the patient's "usual" pharmacy, with no difference in achieving undetectable VL, and mean CD4 count, between the choice of hospital pharmacies or traditional community ones. These results are different from previously published studies.15-17 There was no difference between urban and rural areas, or between areas of high and low HIV prevalence regarding the place where ARVs were dispensed. We note that in France, community pharmacies form a dense neighborhood network where qualified licensee pharmacists own their businesses, providing patients and public health care with an unequaled degree of protection. Simplified treatments might suggest that it is now easier to obtain community dispensing in greater

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### TABLE 3 Offer of medication file by pharmacists, and response by people living with HIV (PLHIV)

| Offer of medication file by pharmacists | n (%) |
|----------------------------------------|-------|
| Never                                  | 18 (10.2) |
| No time                                | 5/18 (27.8) |
| Systematic refusal                     | 13/18 (72.2) |
| No point                               | 2/18 (11.1) |
| Not applicable                         | 15 (8.5) |
| Depends on work load                   | 19 (10.7) |
| Depends on patients                    | 55 (31.1) |
| Other chronic disease                  | 19/55 (34.5) |
| Lives near pharmacy                    | 3/55 (5.5) |
| Already seen several times             | 39/55 (70.9) |
| Systematically                         | 70/39.5 |
| Response of PLHIV N = 1137             | N = 1137 |
| Not heard of medication file           | 475 (41.8) |

| Offer of medication file               | n (%) |
|----------------------------------------|-------|
| Offer of medication file               |       |
| Never                                  | 120/694 (17.3) |
| No time                                | 494 (42.7) |
| Yes, at least once                     | 120 (17.3) |
| Acceptance                             | 96/120 (80.0) |

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### 4 | DISCUSSION

With factorial analysis, three PLHIV groups were identified, young and working people who represent around 60% of all of them, males with cardiovascular disease (22%) and those living with anxiety (18%). Current dispensing of ARVs in hospital or in community pharmacies is associated with these PLHIV profiles. Satisfaction of PLHIV was primarily because of confidentiality, followed by good stock availability, the offer of personalized advice from the pharmacist, management of noncompliance, side effects, and drug-drug interactions management particularly for those living with anxiety. Among the pharmacists surveyed, the dispensing of ARVs, most often confidential, did not raise any particular problem—but almost 80% of pharmacies did not know if other treatments were dispensed elsewhere. The existence of the medication file was known by fewer than half of the PLHIV—and only one third of the pharmacists declared that they offered it—but it was most often accepted when offered. However, most of the pharmacists did not expect such high acceptance. The medication interview in hospital and/or community pharmacies would have been accepted by one third of the people receiving ARVs, at treatment initiation or shortly after ARV switch, and anxiety-prone PLHIV. The PLHIV who would benefit from these interviews and who would accept them seemed to be well identified...
TABLE 4 Future medication interviews

| PLHIV: comparison according to wish for interview with the pharmacist for better compliance and/or knowledge of ARV treatment | Acceptance of interviews (N = 343) | Refusal of interviews (N = 735) | \( p^* \) | \( p^{**} \) |
|---|---|---|---|---|
| Male | 232 (67.6) | 507 (69.0) | .63 | .99 |
| Age (years) | 49.4 ± 10.7 | 50.2 ± 11.8 | .46 | .71 |
| Lives in town | 265/330 (80.3) | 555/718 (77.3) | .33 | .93 |
| In work | 183/335 (54.6) | 405/723 (56.0) | .54 | .71 |
| Lives with partner | 131/335 (39.1) | 332/724 (45.9) | .06 | .71 |
| Duration of ARV treatment (years) | 10.7 ± 7.8 | 12.2 ± 8.3 | .01 | .04 |
| CD4 count | 648 ± 310 | 682 ± 375 | .30 | .91 |
| Undetectable viral load | 229/266 (86.1) | 557/611 (91.2) | .02 | .04 |
| Other treatment | 235/341 (68.9) | 452/731 (61.8) | .02 | .53 |
| Anxiety | 81/341 (23.8) | 118/730 (16.2) | .01 | <.001 |
| Dispensing in hospital pharmacy | 97/339 (28.6) | 202/733 (27.6) | .92 | .07 |

- **Usefulness of interviews**: 142/172 (82.6)
- **Difficulties setting up**: 74/167 (44.3)
  - Patient refusal: 35/74 (47.3)
  - Lack of time: 27/74 (36.5)
  - Lack of competencies: 26/74 (35.1)

| % Patients interested | ≤30% | 61/150 (40.7) |
|---|---|---|
| 50% | 45/150 (30.0) |
| ≥75% | 44/150 (29.3) |

| Patients probably interested | All | 74/136 (54.4) |
|---|---|---|
| Recent infection | 45/136 (33.1) |
| With other associated treatments | 30/136 (22.1) |
| Noncompliant | 29/136 (21.3) |
| Anxious | 26/136 (19.1) |
| Self-medication | 25/136 (18.4) |
| Alone | 14/136 (10.3) |
| Already attended | 13/136 (9.6) |
| Older | 12/136 (8.8) |
| Male | 7/136 (5.1) |
| Unemployed | 2/136 (1.5) |

Note: Data are presented as number of subjects (associated percentages) or mean ± standard deviation. \( p^* \), univariate analysis, \( p^{**} \), multivariate analysis.

- **PLHIV**: people living with HIV.
- **ARV**: antiretroviral.

confidentiality. Nonetheless, the figure of 70% for community dispensing ARV is stable, and for the last 5 years some 30% of patients, predominantly female, older, employed, and less anxiety-prone, have still preferred hospital dispensing, a finding specific to France, with viral hepatitis medication.\(^4\,18\) A recent thesis in pharmacy, in a survey on PLHIV who went for their ARV medication to the hospital pharmacy at the Rennes teaching hospital reports that: the older patients, seropositive for more than 20 years, wanted the hospital dispensing to continue, fewer of them informing their local community pharmacist that they were being given ARVs in the hospital when
they collected medication for comorbidities. Hospital dispensing is also preferred by employed people, and by women, a large proportion of whom are of African origin. This may be for greater confidentiality, in which we could glimpse evidence of a persistent feeling of stigma. Whatever the cause may be, such dispensing is associated with less anxiety.

Concerns about medication file were well examined by Gilbert in 2016 and Barnes in 2020, in terms of adherence rate, VL, and CD4 count in clinics—highlighting the impact of HIV-trained pharmacists embedded in clinical services. In our study, the high level of PLHIV with undetectable HIV VL (nearly 90%) is maintained whatever the mode of dispensing. Despite this high level, the large acceptance of the patient medication file (80%) might encourage pharmacists and compel them to offer more clinical activity as patients will age and be prescribed treatments for comorbidities. In some countries, adequate checks for drug interactions are facilitated by an online medication file or a merging of pharmacies’ data to a central database. In the same way, it is a pity that only 7% of patients felt well cared for because “medication advice” was offered to them, that only 7% considered that their pharmacist could help their compliance, and only 9.6% thought that their pharmacist could help them manage their drug interactions. The online medication file was only offered to a minority of patients and interviews are not common at all.

Concerning medication interviews, it is interesting to compare the results of this work with those of a national survey conducted by Opinion Way from 20 January to 16 February 2017. This survey was of a sample of PLHIV representative of the French population aged over 18 years old who had gone to a pharmacy in the last 2 weeks, and respondents among staff in the pharmacies used by the patients, through an online self-questionnaire. In this Opinion Way survey, the medication interview was considered very useful by 31% of the patients, and moderately useful by 35% of them. If remuneration was such as to make this service provision cost-effective, 63% of the pharmacists would be ready to offer it. It seems logical that the involvement of pharmacists in patient care may relate to the costs involved. Pharmacists would like these services to be remunerated. The remuneration, or lack thereof, of pharmacists’ clinical activities is the major barrier to the implementation of patient-oriented activities by pharmacists. Thus, the responses to our survey, in which the questions did not mention any remuneration, provide more precise complementary information.

First, the pharmacists’ readiness to offer interviews was of the same order (82%) as recommended by the Pharmacy Academy. Second, difficulties were brought up concerning not only patient refusal, but also time constraints and the pharmacist’s competencies, which would require training provision from the COREVIH, focusing essentially on overall care and on knowledge of care networks. It is noteworthy that people who were most likely to need pharmacists’ help, and identified by the latter, were also those who most often wanted medication interviews. They made up 31% of the survey sample, equivalent to 30-50,000 persons in the whole French population.

It is less surprising that people who had started treatment recently, with less undetectable VL, and anxiety-prone people were especially seeking medication interviews. These situations are well recognized by pharmacists.

Certainly, European recommendations for initial ARV treatment give first place to therapeutic combinations associating two nucleoside/nucleotide analogs and an integrase inhibitor, if possible in one daily tablet. They eschew earlier associations including a third agent, a boosted protease inhibitor, implying a greater number of tablets and of boxes dispensed (and so a risk of less confidentiality), plus an often poor digestive tolerance and a risk of metabolic disorders, in turn increasing cardiovascular risk, and combinations, including a first-generation non-nucleoside reverse transcriptase inhibitor (efavirenz or nevirapine), which were responsible for neuropsychiatric or hepatic complications. Also, once a favorable virological outcome is achieved, optimization of the treatment, either to simplify self-administration or to correct and prevent the occurrence of unwanted events, is now acceptable as it is less deleterious and improves quality of life. For patients who have been treated for a longer time, and who may present certain comorbidities, the setting up of medication interviews could be of value if they covered both ARVs and comorbidity treatments (provided required information was available: forgotten prescriptions, inaccessible medical reports, etc), as confirmed by pharmacists’ answers concerning the medication file.

5 | CONCLUSION

This study analyzed ARV dispensing with a dual focus on the medication file and the medication interview. Even though health-care systems vary greatly from country to country, it appears to us that this study has clear implications for the clinical improvement of all PLHIV worldwide. Survey findings suggest that better links could be established between PLHIV and the pharmacists completing the care pathway. The high rate of patient acceptance of the medication file (80%)—when the patient was aware it existed—was not anticipated by the pharmacists. Yet pharmacists were aware that a medication interview would be of benefit to those patients who had recently been prescribed ARVs, with a nonstabilized virological status, and who were anxious; such persons accounted for most of the third of patients surveyed who would have accepted the interview. Therefore, pharmacists have an obvious role in patient adherence, and management of comedications. Yet, clinical practice guidelines were described by Tseng. However, pharmacists considered that to set up such interviews they first needed training, focused mainly on support and overall care of PLHIV, as their professional activity covers principally patient-oriented services. Pharmacists could be even more important health-care pathway actors. This trend offers a timely instrument to optimize the coordination of care and health practitioners as recently highlighted by Hill.
coverage of costs, it is unlikely that the pharmaceutical care for PLHIV in France will change.

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CONFLICT OF INTEREST

None declared.

AUTHORS’ CONTRIBUTIONS

All authors were involved in the study design, data interpretation, reviewed the results, and approved the final manuscript. C.J, JL, and AC supervised the study conduct. DC was responsible for the study conduct. CL supervised the statistical analyses. CJ produced the final version of the manuscript.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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