

Knowledge, disposition, and adherence of Filipino health professionals living with human immunodeficiency virus on antiretroviral therapy: A sequential explanatory mixed methods study

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ABSTRACT

While health professionals have specific roles in the care and treatment of clients with human immunodeficiency virus (HIV), there is a growing cohort of health professionals with HIV (HPH) undergoing antiretroviral treatment (ART) in the Philippines. The study assessed the knowledge on, disposition towards, and adherence to ART of a select group of Filipino HPH (N=30). It likewise explored the lived experience of a subset of 15 HPH undergoing ART. The study employed the explanatory sequential mixed methods of inquiry. It was conducted in a non-government HIV support center in the national capital of the Philippines. The purposive sample consisted of Filipino health professionals with non-occupational acquired HIV and who were undergoing ART. The study used the descriptive-correlational design for the quantitative phase. Data were collected using validated researchers-developed questionnaire. The qualitative phase generated from the results

of the quantitative study employed the Husserlian phenomenology design. It used the face-to-face, in-depth, semi-structured interviews. The hypotheses were tested using Fisher's statistics. Colaizzi's method was used to analyze the qualitative data. Results of the study revealed that study participants have very high level of knowledge on and degree of dispositions towards ART and high level of adherence to ART. There were no statistically significant relationships among the measured variables. Overall, study participants identified drug-related, personal, and social factors that facilitate and deter their adherence to ART. Four themes emerged in the qualitative phase, namely: *On ART, it is a struggle; For ART, it is a partnership; With ART, there is anchorage; and Through ART, there is valuing of self.* Data integration indicates that participants' positive disposition is a key determinant to their high level of ART adherence. Continued research and key policy changes could greatly improve health outcomes and quality of life for HPH.

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INTRODUCTION

There has been an escalating number of individuals with human immunodeficiency virus (HIV) globally in recent times. The burden of the epidemic HIV that causes acquired immune deficiency syndrome (AIDS) continues to severely affect humankind. People living with HIV (PLWH) near the end of 2022 were at an estimated 39.0 million worldwide (World Health Organization [WHO], 2023). (Global United Nations Programme on HIV/AIDS (UNAIDS) 2022) reported that the Asia-Pacific region had 6.0 million PLWH, the second-highest number and 260,000 newly acquired infections in 2021. In Southeast Asia, The Philippines is renowned for its rising HIV cases. Report indicated that there were 110,736 HIV cases in the country as of January 2023. A 411% increase in daily incidence from 2012 to 2023 was reported (Department of Health [DOH] Epidemiology Bureau 2023).

(WHO, 2017) endorsed antiretroviral treatment (ART) for all individuals with HIV instantaneously after diagnosis. Out of an estimated 38.4 million PLWH at the end of 2021, 28.7 million were receiving ART globally (WHO 2022). This evidence-based intervention has transformed HIV infection into a chronic manageable disease and has improved the prospects for extended survival in HIV sero-positive adults (Joint United Nations Programme on HIV/AIDS [UNAIDS] 2023). Standard ART suppresses the HIV, stops the progression of the disease, and prevents onward transmission of HIV, thereby bringing a major impact to the quality of life of PLWH (WHO 2018). However, it was reported that in 2020 only 61% of PLWH in the Philippines were on ART (DOH 2020). DOH had set an administrative mandate to espouse the WHO global policy of “Treat all” and provide ART medication to all PLWH in the Philippines (Mendoza 2017).

Treatment adherence is the cornerstone to positive client outcomes. The effectiveness of ART is greatly dependent on client optimal adherence. ART adherence mitigates HIV from multiplying and mutating, hence reduces the risk of drug-resistance, transmission to others, and treatment failure (WHO 2019). According to the National Institutes of Health (NIH 2025), treatment adherence entails commencing ART regimens, attending regular medical appointments, and taking ART as prescribed. To achieve a 90 % success rate for ART, at least 95 % adherence to the treatment regimens may be adequate (Escartin et al. 2024).

Efforts to achieve and maintain optimal adherence are still lacking in the Philippines despite (DOH 2019) mandating that in every follow-up visit, adherence shall be assessed and reinforced to prevent drug resistance and treatment failure. Ensuring high levels of adherence to ART in the country is challenged by prevailing stigma, paucity of knowledge, and barriers to accessing care (De Lind van Wijngaarden et al. 2018). Suboptimal treatment adherence led to poor outcomes in many patients with HIV in the Philippines (O'Connor et al. 2022).

The intensification of ART has led to a considerable change in the clinical and demographic population of PLWH in Asia and the Pacific region (De La Mata et al. 2017). The Philippines is facing concentrated epidemics (Nepomuceno et al. 2023) among key and vulnerable populations affected by HIV that included 92% of the new cases in the year 2022. These include males engaging in sex with males (MSM), sex workers, transgender women, exploited females, injection drug users, migrant workers, differently abled individuals, and people in confined spaces (Philippine National AIDS Council 2023).

The prevalence of HIV cases in the Philippines has not spared health professionals. It is noted that apart from occupation-acquired HIV, they may also be infected through unprotected vaginal and anal sexual contacts. An increasing number of Filipino health professionals are living with HIV (Salvana and Solante 2015). Despite the fact that they have distinctive roles in the care and management of people with HIV, there is a growing cohort of health professionals with HIV (HPH) in the Philippines who are undergoing ART (Gangcuangco and Eustaquio 2023). Accordingly, 0.03% of persons with HIV in the Philippines are health professionals (Philippine Society for Microbiology and Infectious Diseases [PSMID] 2017).

Health professionals experience complex transitions when functioning both as care providers and care recipients. HIV infection in health professionals generally impacts the healthcare systems. HPH could affect the quality and supply of public health services. As more of them benefit from highly effective ART, their integration into the workplace adds yet another layer of complexity (Harris et al. 2024). Assurance of safety becomes a challenge if they continue to be care providers (Salvana and Solante 2015). (Maulsby et al. 2020) contended that despite their meaningful inclusion in the health sectors, there is still a critical need to find ways to support them in the workforce.

ART has been widely adopted worldwide, but little is known about knowledge on, dispositions towards, and adherence to ART among HPH. There is lack of rigorous research and information especially among health professionals since the diagnosis of HIV continues to convey a significant stigma in the Philippines (Gangcuangco and Eustaquio 2023). There is a call for further investigation whether adequate ART knowledge and positive dispositions will lead to optimum ART adherence (Shrestha et al. 2023).

To fill the aforementioned gaps, the study aimed to assess the level of knowledge on, degree of dispositions toward, and level of adherence to ART among Filipino health professionals with HIV. The relationships of these variables were also tested. Moreover, the study purported to better understand and describe the lived experience of the study participants who are on ART. It was anchored on this central question: What characterizes the lived experience of a select group of Filipino health professionals with HIV who are undergoing ART?

This inquiry has the potential to provide evidence-based results and findings that will be highly significant and beneficial to practice, policy, and research. The study's insights and information could facilitate the involvement of healthcare professionals as frontline care providers of ART programs locally and globally. The study outcomes could fill HIV policy implementation gaps to promote retention on ART regimens. Understanding the lived experience of HPH and being on ART will serve as basis in the formulation and implementation of appropriate interventions and future research priorities. This inquiry provides a strong foundation for future investigations on self-management among PLWH.

Theoretical Framework

The quantitative study was anchored on the Health Belief Model (HBM), developed in 1950 by (Hochbaum et al. 1950). It was formulated on the individual's beliefs and dispositions depicted in four constructs signifying the perceived susceptibility, severity, benefits, and barriers (Becker et al. 1977). These constructs could stimulate adherence behavior (Figure 1). Susceptibility and severity perceptions are the HPH's subjective assessments of the personal risks of acquiring problems and the severity of the outcomes of ART non-adherence. Whereas, perceived benefits and barriers that denote their appraisal of the

advantages of ART adherence and the hindrances that deter them to adhere to the regimens are considered the strongest predictors of their behaviors.

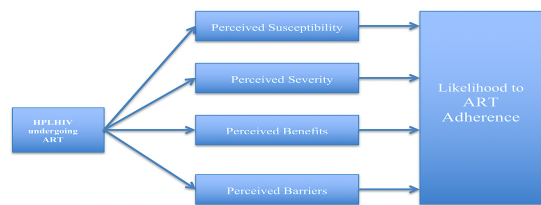


Figure 1: Health Belief Model on Adherence to ART

Philosophical Underpinning

Pragmatism as a research paradigm embraces the plurality of methods adopted by this study. It is anchored on the proposition that researchers used the philosophical and methodological approaches of both quantitative and qualitative that work best for the investigated research problem on ART adherence of Filipino HPH. It recognizes that the study participants’ behavior cannot be separated from their beliefs that have originated from their experiences (Kaushik and Walsh 2019). Moreover, it acknowledges the existence of many different realities that call for multiple ways of inquiry (Lewis et al. 2009). Hence, it provides a degree of adaptability in the integration of the results and findings of the study (Morgan, 2014).

MATERIALS AND METHODS

Design

The study adopted the explanatory sequential mixed methods that occurred in two distinct interactive phases (Figure 2). It involves the quantitative phase, followed by the qualitative phase (Creswell 2011). The intent of this design was to use the qualitative data to explore and make sense of the quantitative data. The design allowed researchers to widen their inquiry with sufficient depth and breadth. It consisted of descriptive-correlational design, which assessed the level of knowledge, degree of dispositions, and level of adherence of Filipino PHP receiving ART. “Dispositions” is operationally defined as how study participants view themselves, relate to others, and respond and react towards their ART experience. It depicts their willingness and commitment to adhere to ART as prescribed. To complement the quantitative data and triangulate information, the Husserlian phenomenology research design was employed thereafter which allowed for a deeper exploration of the participants experience while on ART.

Quantitative results provide information on the participants’ level of knowledge on, disposition towards, and level of adherence to ART. The qualitative findings provide insights for gaining a greater understanding of study participants lived experience of ART adherence. Hence, the study allowed a deeper exploration of the research questions by utilizing a blend of qualitative and quantitative data.



Figure 2: Explanatory Sequential Mixed Design

Study site

The study was conducted in a non-governmental HIV organization center enforcing community-based disease

prevention and health promotion through the implementation of support services to HIV-AIDS patients in the Philippines. The organization’s vision is to administrate centralized and responsive, community-driven HIV-AIDS approaches to develop the overall well-being of PLWH and their families. Its mission is to equip programs and services conjoin with key stakeholders to eventually decrease the magnitude of stigma and discrimination against PLHIV. Its goal is to contribute to the Sustainable Development Goals (SDGs) in reducing the increasing number of infected HIV-AIDS clients.

Sample and sampling design

Participants were purposively selected. Purposive sampling is described by the integration of eligibility criteria met by the participants (Diaz 2015). The study participants were Filipino health professionals, both male and female, at least 18 years old, seropositive for HIV, had been diagnosed within 6 months, and who successfully completed at least six months of treatment since ART initiation. Their acquisition of HIV was not occupation-related. These criteria aimed to ensure that the selected participants had common experience regarding the studied phenomenon. The purposive sample of N=30 for the quantitative phase and N=15 for the qualitative phase consisted of varied health professionals such as doctors, medical technologists, midwives, nurses, occupational therapists, optometrists, pharmacists, and pulmonary therapists. Health professionals in this study were healthcare workers and healthcare providers who provide healthcare services and are educated and trained to diagnose, treat, and prevent illness and injury.

The letter of inquiry addressed to the gatekeeper of the determined study setting was delivered onsite by the principal investigator. Several follow-ups were done to identify and secure the potential participants. Materials such as the informed consent forms, participants’ information sheet for the *robofoto*, and instruments for the quantitative phase were prepared to facilitate the implementation of the recruitment process. Participants were recruited when they attended the monthly meeting of the organization. Unresponsive participants were followed up through calls and emails to contact details that were available on the organization’s registry. Later, the qualitative phase was decided and participants of this strand were recruited from the respondents of the quantitative study until data saturation had been reached. The subset for the qualitative study was so chosen as this phase was to follow-up and explore the results of the earlier quantitative phase.

Instrumentation

In the quantitative phase, the self-report method was employed in the gathering of data using researchers validated developed self-administered questionnaire as tool. The questionnaire was divided into 4 sections. Section A comprised the study participants’ profile, section B determined their level of knowledge on ART, section C assessed their degree of dispositions towards ART, section C measured their level of adherence to ART, and section D described the possible underlying factors that could affect their adherence to ART. The questionnaire was made available in the English language. An epidemiologist, an infectious disease physician, and an infectious nurse specialist proficient in HIV management and in the provision of ART and had experience in the field of clinical research reviewed and approved the content validity of the instrument. They gave their professional evaluation of the items and content, assessment of how relevant and comprehensible the tool was to its target participants and context. appraisal of the structure of the questionnaire and analysis of its format and presentation. Minor revisions were made according to the recommendations of the validators. A pilot test was administered thereafter to a sample of study-eligible participants

in a non-study site to test the reliability of the instrument obtaining a Cronbach’s alpha reliability coefficient (α) of 0.817.

Before conducting the qualitative phase, the desired items in the interview guideline were designed according to the results from the quantitative phase (Creswell 2013). Face-to-face, in-depth, semi-structured interviews were administered following a post-interview training of the researchers. The *aide memoire* (Table 1) that consisted of a set of guide questions was made to explore subjects associated with participants’ experiences, beliefs, perceptions, opinions, and behaviors about their adherence to ART. It composed of a number of open and closed-ended questions on specific topic areas on participants’ ART

experience giving opportunities for researcher-interviewer to probe and clarify responses while emboldening participants to create their narratives freely. Key topic areas were based upon *a priori* knowledge that the research questions were anchored (Ritchie and Lewis 2003). The desire to describe and understand participants’ lived experience on ART is an example of this. A psychiatrist, a psychologist, and a psychometrician validated the guide questions. The interview guide questions were piloted on a subset of participants. Areas and ideas that were not anticipated and uncovered at the quantitative phase unfolded during the interviews.

Table 1: Aide Memoire

<i>Objective:</i> The study explored the lived experience of Filipino health professionals living with HIV while undergoing antiretroviral therapy <i>Central Question:</i> What characterizes the lived experience of a select group of Filipino health professionals on antiretroviral therapy?		
Layer of Human Experience	<i>A Priori</i> Codes	Interview Questions
<i>Filipino health professionals living with HIV on ART</i>	Philippines has become the country with the fastest growing HIV epidemic in Asia and the Pacific (Department of health [DOH] Epidemiology Bureau 2023). WHO endorsed antiretroviral treatment (ART) for all individuals with HIV instantaneously after diagnosis (WHO 2017). There is a call for further investigation whether adequate ART knowledge and positive disposition will lead to optimum ART adherence (Shrestha et al. 2023).	1. Please describe your experiences while undergoing antiretroviral therapy (ART). 2. How do you describe the role of ART in your life? 3. How does ART impact your life? 4. What of ART that you like best? 5. What of ART that you like least?

Procedures of data collection

The data collection process continued in two phases after approval from the Institutional Review Board. Informed consent was obtained from each participant who voluntarily took part in this study; this included consent to use an audio recorder and to present and publish the paper. The participants were then invited to complete a self-report survey depending on their preference, in either paper or online format. The administration of the questionnaires was aligned to the scheduled meetings of the PLHIV organization to minimize inconvenience to the participants. The time required to accomplish the questionnaire was 15-20 minutes.

The scheduled in-depth interviews were conducted and audiotaped in Filipino and English languages by the researchers and lasted 1–1½ hours. The participants were reminded about the need for a follow-up by means of telephone calls to ascertain that the study findings reflect their own experiences. During the interview, memoing was applied, and non-verbal data such as facial expressions, tone of voice, body language, and behaviors were also recorded. All interviews were carried out in a private room within the study site. Interviews were audio recorded, then transliterated verbatim into the English language. The level of data saturation was decided mutually by the researchers in an iterative approach.

Methods of analysis

Data analysis involved 2 phases: quantitative and qualitative. In the quantitative phase, descriptive statistics, including frequencies and percentages were used to assess the distribution

of the profile variables. Weighted mean and standard deviation were calculated for participants’ level of knowledge on ART, degree of dispositions towards ART, and level of adherence to ART. The inferential statistics of Fisher’s exact test ($p=0.42$) was employed to examine the relationships of the study participants’ level of knowledge and degree of disposition with their level of adherence to ART. Significance was set at $p< 0.05$. The Fisher exact test is primarily used for small sample sizes because it provides an exact probability of observing the data under the null hypothesis, rather than relying on an approximation (Kim 2017).

Qualitative data gathered were analyzed according to (Colaizzi 1978) 7-step method, which consists of textural and structural analyses. Each transcript had undergone thorough perusing to make sense of the substance of the entire content. Significant statements relevant to participants’ ART adherence were then culled from the field text. The meanings of the extracted statements were formulated, which were then sorted into categories and themes. These were followed by the integration of the findings into an in-depth and comprehensive description of the fundamental structure of participants lived experience on ART. Finally, validation of the findings was sought from the participants through the members checking technique.

The study accomplished the integration of collected data by adopting the explanatory sequential mixed methods design throughout the research process. There were integrations during the study design, methods implementation, analysis and interpretation, and reporting stages. Integration was observed at

the methods level through connecting, building, and merging (Fetters et al 2013). Study participants from the first phase crossover to participate in the second phase in sampling. Quantitative results built on qualitative findings. After analyzing each phase separately, the analysis of two datasets was merged. “Following a thread” technique was applied that begins with data analysis wherein each component was analyzed to identify key findings. This was followed in a form of a theme emerging across other components. Quantitative questions from the tool were matched to the interview questions. Using a “weaving technique”, the main findings were presented side-by-side from the quantitative and qualitative data (Guetterman et al. 2015). A joint display was developed to identify new insights from the combined data. Additional information was explicated from the joint quantitative and qualitative data that provides a more holistic interpretation of participants’ narratives (Fetters et al. 2013). By integration, the variables measured were elucidated by the essence of the participants lived experience on ART adherence.

Validation techniques

Transferability, credibility, dependability, and confirmability were observed to ensure the trustworthiness of the study (Lincoln and Guba 1985). In transferability, the researchers evaluated how appropriate and able to be made more generally applicable the study outcomes are to other contexts and settings. Credibility deliberated how acceptable and undoubted the integrated findings are according to the data. Dependability assessed how consistent and reliable the findings are over time and across different researchers. Confirmability evaluated how objective and unbiased the findings are (Stahl and King 2020).

Rigor was maintained in the study’s components that were evaluated as a whole, which supported the integration of the method. Rigor was enhanced by the degree to which the interpretations of the data were derived directly from the results and findings obtained from the integration of the data (Eckhardt et al. 2017). Bracketing, horizontalization, and resonance were likewise observed. Bracketing was applied with the data collected and with emergent findings. The researchers temporarily set aside their *a priori* knowledge, assumptions, and beliefs. The data were then revisited, comprehended, and revised as they evolved (Fischer 2009). In the horizontalization process, the significant statements were given equal value (Creswell 2013). Resonance was observed when the researchers demonstrated the stance of openness and receptivity toward potential meanings embedded in the text (Given 2008).

The validation techniques of members checking (Doyle 2007) or corroboration by the study participants and agreement between researchers (Creswell 2013) and critical friends were applied to enhance the quality of the study. Data analyzed were presented and discussed among the researchers and the study participants to verify that meanings were those expressed directly or indirectly by the participants. Agreement between researchers was also obtained. In critical friends, persons who are experts on the study method willingly assisted in the process of encoding data. Finally, all coders compared their respective analyses and, if necessary, according to mutual agreement, the categories were reorganized to validate the data obtained (Stahl et al. 2020).

Ethical considerations

The Institutional Review Board of a private tertiary healthcare institution granted the ethical approval of the study. All rules of ethics stipulated in the Belmont Report, such as beneficence, respect for human dignity, confidentiality, anonymity, and justice were observed throughout the research process. Written informed consents were obtained from all the study participants. Consents were granted by the participants to audio record the face-to-face interview procedures.

RESULTS AND DISCUSSION

Quantitative phase

Most study participants (37%) belong to the age group of 28-33 years old, male (97%), single (73%), and employed (70%) (Table 2).

Table 2: Frequency and Percentage Distribution Table of the Study Participants’ Profile

Variable	Frequency	Percentage
<i>Age</i>		
52-57	1	3.33
46-51	2	6.67
40-45	4	13.33
34-39	9	30.00
28-33	11	36.67
22-27	3	10.00
Total	30	100
<i>Sex</i>		
Male	29	96.67
Female	1	3.33
Total	30	100
<i>Marital Status</i>		
Single	25	83.33
Married	5	16.67
Total	30	100
<i>Employment Status</i>		
Employed	21	70.00
Unemployed	9	30.00
Total	30	100

Study participants exhibited a very high level of knowledge (100%) on ART (Table 3).

Table 3: Frequency and Percentage Distribution Table of the Study Participants Level of Knowledge on ART

Scores	Verbal Interpretation	Frequency	Percentage
0-5	Low Level	0	0
6-11	Moderate level	0	0
12-17	High level	0	0
18-20	Very High Level	30	100
Total		30	100

Study participants had a very high degree of disposition towards ART with a weighted mean of 4.49 (Table 4). Except for items 6 and 10, participants had a high degree of dispositions.

Table 4: Weighted Mean of the Study Participants' Degree of Dispositions on ART as to Perceived Severity, Perceived Susceptibility, Perceived Benefits, and Perceived Barriers

Question	Numerical Interpretation	Verbal Interpretation
<i>Perceived Severity</i>		
1. If I stick to my ART regimens, I will be less likely to have complications such as pneumonia and tuberculosis.	4.27	Very High
2. My CD4 count will continue to decrease once I discontinue taking ART medications.	4.53	Very High
3. Opportunistic infections will occur if my CD4 count declines continuously.	4.70	Very High
4. Stopping ART will result to the logarithmic increase of the virus and will damage my body's immune system.	4.73	Very High
5. When I adhere to ART religiously, I will be less likely to progress to Acquired Immunodeficiency Syndrome (AIDS).	4.53	Very High
Total	4.55	Very High
<i>Perceived Susceptibility</i>		
6. Effective ART reduces the risk of transmission of HIV.	3.93	High
7. I am not skipping dose of ARV medications to prevent the development of multiple drug resistance.	4.63	Very High
8. Once I achieve an undetectable viral load, I will still take ARV medications because it only means that I have a low viral load and viruses are still hidden in some parts of my body. Thus, I still have a risk of developing infections.	4.73	Very High
9. Adherence to ART forestalls my risk of developing therapeutic failure.	4.40	Very High
10. If I adhere to ART appropriately, it will lower my risk of developing HIV-associated kidney disease, liver disease, cardiovascular disease, and neurological complications.	4.03	High
Total	4.35	Very High
<i>Perceived Benefits</i>		
11. All medications that I am taking are essential for treating HIV.	4.43	Very High
12. I am assured that if I have optimal adherence to ART, I could live a normal life.	4.80	Very High
13. I believe that my ART will help me feel better.	4.73	Very High
14. Adhering to ART will not cure me but will enhance my quality of life.	4.73	Very High
15. I can live happily and healthily as long as I am adherent to ART.	4.73	Very High
Total	4.69	Very High
<i>Perceived Barriers</i>		
16. I will still continue my treatment regimen even though it is expensive.	4.50	Very High
17. I do not feel embarrassed to take my medications in public places.	4.33	Very High
18. I do not get impatient when it takes a long time for me to get to the ARV Therapy Center.	4.67	Very High
19. I believe that I need to stick to my treatment plan even though it is difficult and demanding.	4.67	Very High
20. Although I am experiencing side effects of the ARV medications, I still adhere to the regimens.	4.57	Very High
Total	4.40	Very High

Study participants had a high level of adherence to ART (Table 5).

Table 5: Weighted Mean of the Study Participants' Level of Adherence to ART

Question	Numerical Interpretation	Verbal Interpretation
1. I am taking my medications every day at the same time.	4.50	Very High
2. I do not stop or cut back the dose of my medications without telling my doctor.	3.97	High
3. I make sure that I have ARV medicines with me when I go out.	4.67	Very High
4. I do not stop taking my medications even though I feel better.	4.20	High
5. I see to it to take double doses of medications every time I miss one.	1.27	Very Low
6. I never stop taking my medications because of the side effects.	3.43	High
7. When I am not feeling well (cold, flu), I do not stop taking my ART medications	3.70	High
8. I make sure to alarm my phone to remind me to take my ART medications.	4.63	Very High
9. I go to the ART Center to get another set of ART medications whenever I do not have one anymore.	3.63	High
10. I attend my monthly/quarterly consultation with my doctor.	4.53	Very High
Total	3.85	High

There were no statistically significant correlations among the profile variables of the study participants, their level of

knowledge and degree of disposition on ART with their level of adherence to ART (Tables 6,7,8).

Table 6: Fisher's Exact Test of Correlation Between the Study Participants' Profile and Their Level of Adherence to ART

Variable	p-value	Interpretation	Decision
Age and Level of Adherence	0.47	Not significant	Do not reject Ho
Sex and Level of Adherence	1.00	Not significant	Do not reject Ho
Marital Status and Level of Adherence	0.80	Not significant	Do not reject Ho
Employment Status and Level of Adherence	1.00	Not significant	Do not reject Ho

There was no statistically significant correlation between the study participants' level of knowledge and their level of adherence to ART (Table 7).

Table 7: Fisher's Exact Test of Correlation Between the Study Participants' Level of Knowledge and Their Level of Adherence to ART

Variable	p-value	Interpretation	Decision
Level of Knowledge and Level of Adherence to ART	0.30	Not significant	Do not reject Ho

There was no statistically significant correlation between study participants' degree of disposition and their level of adherence to ART (Table 8).

Table 8: Fisher's Exact Test of Correlation Between the Study Participants' Degree of Disposition and Their Level of Adherence to ART

Variable	p-value	Interpretation	Decision
Degree of Disposition and Level of Adherence to ART	0.13	Not significant	Do not reject Ho

There was no significant correlation between study participants' degree of disposition and their level of adherence to ART (Table 9).

Table 9: Fisher's Exact Test of Correlation Between the Study Participants' Degree of Disposition and Their Level of Adherence to ART

Variable	p-value	Interpretation	Decision
Degree of Disposition and Level of Adherence to ART	0.13	Not significant	Do not reject Ho

Most study participants indicated that side effects of ART drugs (80%) and smoking (73%) affect their adherence to ART. Likewise, access to ART centers (50%), family support (50%), and alcohol intake (47%) were determinants of their compliance with ART (Table 10).

Table 10: Frequency and Percentage Distribution Table of Factors that Affect the Study Participants' Adherence to ART

Factor	Frequency	Percentage	Rank
Side Effects of ART Drugs	24	80.00	1
Smoking	22	73.33	2
Access to ART Center	15	50.00	3
Support System	15	50.00	3
Alcohol Intake	14	46.67	4
Health Perception	13	43.333	5
International Migrant	12	40.00	6
HIV Perception	12	40.00	6
HIV Disclosure	9	30.00	7
Transgender	7	23.33	8
Others	6	20.00	9

Patient-related factors such as their sociodemographic profile of age, sex, marital status, and employment status were dominant factors in terms of identification of the pattern of practices of epidemic illnesses such as HIV, which was linked with treatment adherence. These determinants can influence compliance with therapy among PLWH and potentially have an impact on their prognosis and survival (Dorcélus et al. 2021). There were an estimated 7,500 newly diagnosed HIV cases in the Philippines among people aged 25 to 34 in the year 2022 (Statista Research Department 2023) as evident by the 37% result of this study in the same age group. Sex is pivotal in defining ART adherence (Girum et al. 2018). (Magdy et al. 2024) indicated in their study that male participants were more likely to be adherent to the treatment than were females. The epidemic of HIV in the Philippines has been propelled by sexual transmission among men who have sex with men (Ditango and Mationg 2022). (Tlou 2019) conveyed that marital status was a significant influence of HIV infection. Moreover, employment status, a vital factor used to comprehend and classify a population's socioeconomic profile, can greatly impact HIV treatment adherence (Dorcélus et al. 2021). Socioeconomic status influences one's adherence to ART (Burch et al. 2016). (Nachega et al. 2015) reported that employed persons with HIV were more likely to adhere to ART than unemployed individuals.

Demographic factors can affect adherence to treatment among PLWH. Understanding these factors that influence ART adherence could assist in the effective implementation of adherence intervention programs. Healthcare professionals and policymakers must consider these significant determinants in developing and implementing regimen adherence initiatives among PLWH.

Health professional participants have a very high level of knowledge on ART that facilitates attainment of optimal adherence. Knowledge of persons with HIV plays a critical role in ART adherence. This could be an outcome of intensive counselling sessions that were provided before enrollment to ART (Musayón-Oblitas et al. 2019). The (WHO 2024) takes a proactive approach with HIV treatment through education to improve ART initiation, adherence, and retention. Understanding the medication regimen enables PLWH to overcome barriers to adherence (Fernandez-Lazaro et al. 2019). High knowledge of ART is correlated with adherence to ART, in contrast, a low knowledge results to decreased adherence (Xu et al. 2023). (Demessie et al. 2017) argued that the low level of knowledge of ART could be a barrier to adherence. However, though people are progressively cognizant of HIV testing in the Philippines, remarkably, few understand about HIV treatment or what transpires subsequently when someone is diagnosed as HIV positive (Garcia 2016).

Adequate knowledge leads to understanding the disease and the treatment regimens, which are critical to attaining optimum ART adherence. Health professionals, such as nurses, are in a better position to generate knowledge as regards to HIV-AIDS thereby influencing positive attitudes towards ART. Educational opportunities must be intensified to provide the necessary support to PLWH to enhance their ART adherence.

A very high degree of dispositions impact participants' ART adherence. Grounded on Dewey's construct, dispositions are referred to as "underline motivators" for behavior (Dewey 1922), and are habits growing from experiences (Dewey 1938). Prior research has linked medication adherence to positive dispositions of self-motivation and treatment adherence (Fleicher and Avery 2020). Participants in this study had the willingness to commit to the regimens as they perceived its benefits of living long, enhanced quality of life. Despite the many barriers, they must remain adherent to reduce the risk of HIV transmission, prevent the severity of their condition, and make them less likely to be susceptible to complications. (Hochbaum et al. 1958) Health Belief Model (HBM) posits that critical areas of perceived susceptibility, perceived severity, perceived benefits, and perceived barriers influence the probability of adhering to the recommended treatment such as ART. (Minja et al. 2019) suggested that although some barriers to optimal adherence are beyond patients' control, other factors are driven by their dispositions on how they perceive and value treatment. (Mi et al. 2020) reported that self-efficacy leading to dispositions of openness and disclosure of HIV status is considered to be a crucial determinant of ART adherence. (Kasumu and Balogun 2014) stressed that the increase in knowledge about ART together with the continuous counselling given to the patients to encourage adherence to their medications could explain the very high proportion with positive dispositions.

The key to effective ART treatment is a high degree of positive dispositions towards the regimen. Negative dispositions must be recognized as possible significant mediators that should be aimed for interventions intended to increase ART adherence. Intervention programs guided by the relationships of HBM constructs and ART adherence must be developed to empower PLWH and to teach them to be effective self-managers of their own well-being. Additionally, a supportive environment can enhance their dispositions, leading to ART adherence and behavioral change.

Health professionals who participated in this study had a high level of ART adherence. HIV therapy requires a high level of adherence to achieve good treatment outcomes and viral load suppression. Adherence to ART according to (WHO 2025) is the extent to which a PLHIV's behavior, such as medication taking, clinic appointment attendance, and modification of diet and lifestyle parallels with the care and treatment plans mutually agreed with his healthcare provider. It is of utmost importance that patients maintain consistent level of adherence to keep the suppression of the HIV in the blood, decrease the possibility of drug resistance and improve quality of life (Iacob et al. 2017; WHO 2022). Overall, study participants demonstrated a high level of ART adherence, hence, they do not miss their medications. However, (NIH 2025) reiterates to take the missed ART medicine immediately upon realization but not to take a double dose to make up for a missed dose. Near-perfect (>95%) adherence is necessary to achieve full and durable viral suppression (Byrd et al. 2019). ART is considered to have better efficacy than any other form of prevention like condoms, circumcision, microbicides, vaccines, and probably even abstinence (Schinazi et al. 2022). (Mi et al. 2020) contended that though ART is important to PLWH, the rates of optimal ART adherence continuously remain low.

Adherence to ART, which is highly recommended, is achieved if public health professionals and policymakers develop and implement more responsive and equitable ART programs to improve adherence. Additionally, health care delivery systems need to acknowledge their role in improving medication adherence, where the implementation of a variety of adherence approaches should be explored.

Results indicate that there is no significant correlation between study participants' profile variables and their level of adherence to ART. There are diverse determinants to ART adherence apart from individual profile variables. Some studies have conflicting results regarding the factors related to ART adherence. Age, sex, civil status, and employment status do not significantly affect adherence to ART (Mitiku et al. 2013). Nearly 70% of studies analyzing HIV medication adherence found that women were less likely than men to take their ART drugs (Pearson 2013). The study conducted by (Nash et al. 2016) revealed that there is no significant association between marital status and adherence to ART. (Okoronkwo et al. 2013) indicated that 48.9 % of those who are employed tend to miss their medications as compared to 21.8% of those unemployed.

Likewise, study participants' level of knowledge on ART and their level of adherence to ART are not significantly correlated. (Villiera et al. 2020) and (Bezabih et al 2021) argued that knowledge alone is not enough, especially for more complex treatment regimen such as ART that necessitates behavioral changes to perform the healthy behavior. Moreover, even if one has good knowledge about ART, there may be other situations or conditions that can disrupt optimal adherence (Hornschuh et al. 2017). Whether ART knowledge and adherence have a positive relationship needs further investigation, according to (Shrestha et al. 2023).

Moreover, there is no significant relationship between study participants' degree of dispositions towards ART and their level of ART adherence. However, HBM constructs represent PLHIV's dispositions that could be activated to compel adherence behavior (Mukumbang et al. 2017). (Schneider et al. 2017) asserted that adherence to ART can be influenced by a number of factors apart from PLHIV's dispositions, which include the patient's demographics, social situation and clinical condition, the prescribed regimen, and the patient-provider relationship.

Adherence is a complex health behavior that is influenced by drug regimens. While no distinct intervention approach can enhance the adherence of patients, studies agree that positive endeavors to improve patient adherence are contingent upon a set of key factors. Hence, multidisciplinary professionals are challenged to design patient-centered strategies to optimize adherence and sustained retention of care. Moreover, because of diverse factors impacting ART adherence, it is vital that they are investigated in varied groups of PLHIV and settings to assist in enhancing adherence to ART.

There are several determinants that influence ART adherence. (Xie et al. 2021) stressed that ART entails lifetime treatment, which brings both positive and negative experiences for clients. Side effects are the typical explanations for nonadherence to ART which result to suboptimal treatment outcomes (Horne et al. 2019). Cigarette smoking and heavy alcohol use have been linked to unsatisfactory ART adherence (Cioe et al. 2017). Apparently, family and friends support is a vital factor in influencing ART adherence. Perceived emotional support from family is correlated with reduced risk of ART non-adherence (Nabunya et al. 2020). Family support along with no or minimal discrimination was found to contribute to quality of life among people infected with HIV (Xu et al. 2017). Good clinical

outcomes of ART depend on access and adherence to treatment. Access to ART for people with HIV/AIDS in developing countries has significantly enhanced in recent years (Gangcuangco and Eustaquio 2023). Since 2010, the number of people gaining access to antiretroviral medicines has beyond doubled (WHO 2017).

Successful and failed ART adherence are due to multiple factors. While facilitators enhanced adherence, the barriers deterred ART retention. Concerted and collaborative efforts of families, communities, health officials and professionals, and policymakers are essential to concretize effective and efficient interventions to enhance the facilitative influences and reduce the deterrent factors to improve the adherence level.

Qualitative phase

After a thorough comparison of the articulations of the study participants, 4 interesting themes emerged, namely, *On ART, it is a struggle*; *For ART, it is a partnership*; *With ART, there is anchorage*; and *Through ART, there is valuing of self*. The themes describe the lived experiences of a select group of Filipino health professionals receiving ART as they undergo the struggles, play their role as partners, become grounded due to their support system, and learn to value themselves. This is illustrated in the simulacrum entitled, “The Four-Faceted Phenomenology of Filipino Health Professionals with HIV on ART” (Figure 3).

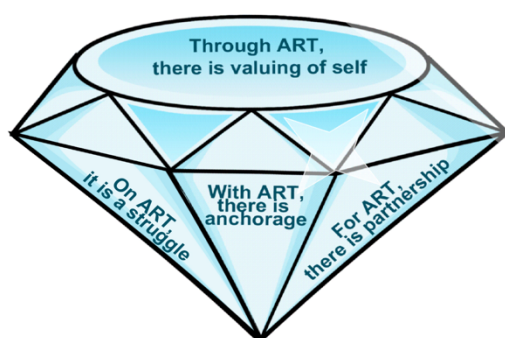


Figure 3: The Four-Faceted Phenomenology of Filipino Health Professionals Living with HIV on ART

On ART, it is a struggle

Study participants experience not only the disease burden but they convey their struggle as well while on ART. The cornerstone of this theme appraises their state of pessimism, frustration, and powerlessness as they encountered the trajectory of the therapy and how it affected them. As evident by these articulations:

“Sticking to my treatment plan isn’t always easy. Antiretroviral drugs can cause side effects that can be severe enough to make me sometimes stop taking them. The side effects get worse the longer I take the drugs.” (Study Participant [SP] 7);

“At the start of my regimen, I cannot eat, I had no appetite. I had diarrhea as well. In my 4-6 months of treatment, I lost weight which made me self-conscious. My social life was affected because I didn’t want to be seen in gatherings.” (SP 11);

“Going through the treatment routine seems like I don’t have any purpose in life. I thought what’s the point of living if I don’t get to fulfill my dreams? What’s the point of treatment if I can’t do the things I want to do? That’s when I thought of committing suicide.” (SP 15)

Predominantly, ART is a challenge for study participants struggling with taking their medications consistently. They

experience ART-related treatment frustrations and detestation alongside drug fatigue and side effects. Aversion towards ART as a lifetime regimen is their primary concern. They experience drug interactions and side effects during the first trial of ART, specifically the occurrence of rashes, upset stomach, persistent vomiting, and dizziness that can be difficult to deal with.

For ART, it is a partnership

The study participants realize that ART may be a lifelong undertaking and they face a lifetime of treatment. Thus, they develop a relationship of partnership with the regimen. As conveyed by the following articulations: *“I became health conscious to be adherent and compliant to the regimen to avoid what they call drug resistance”*; *“When I forget to take my medications, I would return back home, though I’ll be late for work, to retrieve my antiretroviral drugs and not miss taking them.”* (SP 1); *“I need to stick with my partner, the treatment plan, being adherent could prevent me from acquiring viral resistance.”* (SP 14); *“ART is essential because staying loyal with it assures me of long-term therapeutic success.”* (SP 15).

Their choice to ultimately accept ART lies with their willingness and readiness to make ART their partner in life. On one hand, the role of ART is to prolong their lives, to prevent them from acquiring opportunistic infections and to improve their quality of life. On the other hand, the study participants’ role is to devote themselves to the ART regimen through their strict adherence to the dosage, scheduling, required follow-up and monitoring visits. The study participants are cognizant of the significance of ART in keeping them healthy over the years. Adherence to ART improves their quality of life. Hence, they committed to a lifelong partnership with the regimen. They are able to accept that they cannot live without ART, that ART is half of their lives. Whatever they do, wherever they go, ART is always with them.

With ART, there is anchorage

This theme depicts the study participants’ strong hold of survival to continue with ART. They are able to endure the treatment with the help of the people around them like their family, friends and people from support groups who give their unconditional love, compassion and understanding of what they are going through. As manifested by the following verbalizations:

“A survivor from an organization that supports PLWHIV introduced me to the group. I then became convinced to enroll in ART. From then on, I am so attached with the ART regimen to ensure its optimal benefits.” (SP 4)

“The support of my family and friends enabled me to be secure with ART. There’s no discrimination with them because they realize how critical my adherence to ART is. ART stabilizes my life now, wherein with my support system, I can be able to live a quality life.” (SP 10)

Being diagnosed with HIV can be a terrifying experience. It becomes more difficult, especially with the stigma surrounding HIV because of this the study participants also struggled on how to inform their families about their situation. Before enrolling in ART, the study participants must attend a series of counselling sessions wherein they will be educated about the treatment and possible experiences that they need to expect when starting on ART.

Through ART, there is valuing of self

The study participants expressed a culmination of positivity, strong determination, self- acceptance, and rejuvenating prayers towards self-value. It showcases their realizations, sanguinity, conformity, and gratefulness as the study participants crossed the ART-related predicaments. Because they value themselves, they can still be productive through all the struggles,

partnerships, and anchorage noting that they have contemplated their worth. Health professionals in the study exhibit changed visions, love for one's self, and stabilized physical and emotional aspects leading towards quality life. This is demonstrated by the following verbalizations: *"I need to have a positive approach with my condition to embrace the new normal in this life. Having this mindset and disposition makes me persevere. I start to value myself because of the better life expectancy ART offers."* (SP 10); *"I have to be optimistic. I know that with ART, I can still contribute to society. I can be an example to those who are losing hope because they are PLHIV."* (SP 12); *I am proud of myself and I am confident that I can overcome the challenges while I am on ART. I have the capability to make things right. I deserve to live and have a bright future."* (SP 14)

The study participants learned how to accept themselves in a holistic perspective of all dimensions of life, such as physical, emotional, mental, and spiritual. The struggles they have been through gave them the opportunity of discovering their worth. Therefore, health professionals in this study regain their hope and determination to continue with life. They did not permit those challenges to surpass their will to continue the therapy, but rather they allowed their strong willpower.

No matter who they are, HPH face certain battles while on ART. They continuously struggle with the ART regimen's complexity and a range of treatment side effects. The difficulties integrating adherence to ART into their daily routine take a toll on PLWH. They struggle with ART adherence due to a variety of interrelated factors (Jaiswal et al. 2020). There are serious and severe side effects of the therapy for the seropositive people that occur during the first month of the course of the treatment (De Padua et al. 2017). Oftentimes individuals with HIV struggle with adherence to ART and encounter complex barriers that would therefore affect the success of the intervention (Chen et al. 2017). Uninterrupted adherence in retaining viral suppression decreases symptom burden (Tadese et al. 2024).

Barriers and challenges remain in ART adherence. Notwithstanding optimizing the well-being of PLWH, they struggle with the challenges adhering to daily regimens. Continued research needs to focus on the improvement of ART agents that minimize the risks and side effects for all people with HIV. Additionally, developing novel therapies and approaches to ART are paramount to address the numerous challenges and hence promote ART adherence and retention.

Partnering with ART regimens facilitates adherence to the treatment, resulting in positive clinical outcomes and enhanced quality of life. Participation in health care and treatment has been associated with improved treatment outcomes. (Nursalam et al. 2024) proposed that to optimize ART adherence and the quality of life among PLHIV, it is vital to adopt an attitude and mechanisms that comprise a range of individual subjective factors. Patients' participation in health care and treatment has been associated with improved treatment outcomes (Marzban et al. 2022). The (WHO 2017) reiterates that the participation of patients in decision-making processes is critical to the outcome of any treatment program.

PLWH develop reciprocal relationships with their ART regimens. They become partners over time as they travel the journey in achieving and maintaining viral suppression. Stakeholders involved in the support system of PLWH are encouraged to develop partnership dynamics that support adherence to ART. They become teammates with the PLWH in

establishing adherence goals as appropriate. As partners, they may provide social support that encourages medication-taking behaviors.

Enduring health stability is achieved with optimal adherence to ART coupled with a strong support system. Social support is largely considered an empowering factor for engagement in HIV care (Tam et al. 2023). Likewise, (Okonji et al. 2020) state that ART necessitates social and psychosocial support aside from medical attention. However, the presence of stigma in the person's social and community environment hinders them from getting support (De Los Rios et al. 2020).

Access to resources such as psychosocial support provides a means of securing and a source of reassurance to PLWH to increase and maintain adherence to ART. ART regimen can be complex and requires a strong support system that matches the needs of the situation. Psychosocial support in the form of support groups is to be recognized domestically and internationally. There must be standardization in the services they provide to foster enduring ART adherence.

Participants relearn to value themselves with continual adherence to ART, where they achieve viral suppression that gives rise to their enhanced quality of life and reduced risk of complications. (Shorey and Lopez 2021) stressed that valuing self and ART adherence are positively correlated, as individuals with higher self-esteem are more likely to believe in their ability to manage their health and follow treatment plans. If one possesses positivism, he executes the necessary practices for the fulfilment of one's wish or desire. (Nguyen and Noussair 2022) reported that positive emotion is associated with increased cooperation. A sense of self and HIV-positive identity promote the acceptance of self and ART (Ho et al. 2020).

Despite the challenges, HPH maintain positive dispositions on their lives that lead to valuing themselves as they establish coping behaviors, increased treatment adherence, enriched health outcomes, and enhanced quality of life. Therefore, policies must underscore evidence-based, self-management interventions purposefully designed for PLWH. A strengthened support system is necessary not only to help them stay healthy and remain engaged in HIV care but likewise promote the establishment of their personal development goals that allow having a sense of meaning in life.

Data Integration

A joint display (Table 11) was developed to identify new insights from the combined data. It demonstrated the integration at the interpretation and reporting level. Integration analysis and interpretation indicated that quantitative results were confirmed and expanded by the qualitative findings. No discordance was noted. Outcomes of the integration reveal that the participants' very high level of knowledge and positive dispositions are major determinants that facilitate their ART adherence. This increased their likelihood of engaging in ART adherence. They believe that ART is currently the standard for a successful ART and the most effective available therapy to battle HIV. They are more reliant on ART for the treatment of HIV. Knowledge of ART adherence empowers them to recognize the benefits of the regimens and to overcome barriers to adherence. Seemingly, the constructs of Health Belief Model of perceptions on susceptibility, severity, benefits, and barriers present participants' possible ways that could be activated to elicit their adherence behavior.

Table 11: Joint Display Integration of Quantitative Results and Qualitative Findings

Variables	Quantitative Results	Qualitative Findings	Outcomes
Level of Knowledge on ART	Very high level (100%)	<i>“To achieve optimal results from ART, I should be knowledgeable of the treatment I am undergoing to have a high level of adherence. I need to follow a treatment plan. I avoid restricted foods. I am aware of medications that are contraindicated. I need to take my medications at prescribed times and frequencies,”</i> (SP 11) <i>“I need to stick to my partner, the treatment plan, by taking my medications correctly every day or the virus may become resistant to drugs.”</i> (SP 14) <i>“I became health conscious to be adherent and compliant to avoid what they call drug resistance.”</i> (SP 15)	Confirmed Expanded
Degree of Dispositions toward ART	Very high degree (weighted mean = 4.49)	<i>“I need to have a positive approach to my condition to embrace the new normal in this life. Having this mindset and disposition make me persevere. I start to value myself because of the better life expectancy ART offers.”</i> (SP 1) <i>“I have to be optimistic. I know with ART, I can still contribute to society. I can be an example to those who are losing hope because they are PLHIV.”</i> (SP 9)	Confirmed Expanded
<i>Perceived Susceptibility</i>	Very high (weighted mean = 4.35)	<i>“I need to comply with my ART because I am prone to opportunistic infections. I can develop other health issues due to my weakened immune system. My nonadherence will cause treatment resistance.”</i> (SP14)	Confirmed Expanded
<i>Perceived Severity</i>	Very high (weighted mean = 4.55)	<i>“I am afraid my condition will progress to AIDS, hence, I should take my ART seriously. My adherence must be of the highest level not only to my medications but in everything my healthcare provider prescribed, such as smoking cessation, balance diet, and reporting without fail with my doctor’s appointment.”</i> (SP11)	Confirmed Expanded
<i>Perceived Benefits</i>	Very high (weighted mean = 4.69)	<i>“My adherence is critical to positive outcomes of my therapy which is important for viral suppression. It will decrease my hospitalization, therefore, reduced cost.”</i> (SP 9)	Confirmed Expanded
<i>Perceived Barriers</i>	Very high (weighted mean = 4.40)	<i>“To be adherent, I need to identify the barriers so I can address them. My job is the greatest obstacle to my ART adherence. My forgetfulness to take my medication is due to my irregular schedule. My workplace is far from my residence, and I needed to travel when I forget my pills. So I requested to be transferred to a hospital near my residence.”</i> (SP 7)	Confirmed Expanded
Level of Adherence to ART	Very high level (weighted mean = 3.85)	<i>“When I forget to take my medications, I would return back home, though I’ll be late for work to retrieve my antiretroviral drugs and not miss taking them.”</i> (SP 1) <i>“I need to stick with my partner, the treatment plan, being adherent could prevent me from acquiring viral resistance.”</i> (SP 14) <i>“ART is essential because staying loyal with it assures me of long-term therapeutic success.”</i> (SP 25).	Confirmed Expanded

Limitation of the Study

The study has limitations. Firstly, it does not allow causal relationships among participants’ profile, knowledge on, dispositions towards ART and their ART adherence. The self-reported nature may be subject to recall bias and social desirability. The study lacks external validity due to the small sample size.

CONCLUSION

The study assessed the level of knowledge, degree of disposition, and level of adherence of Filipino HPH on ART regimen. Likewise, their lived experience while on ART was understood and described. For HPH, adherence to ART is the lifeline. Optimum adherence to ART is key to the sustained management

of HIV infection. Health professionals remain the population with the least reported and recorded incidence of HIV globally and understanding their lived experience to ART adherence is critical. The results and findings are well-timed as they provide substantial information not only to health professionals on ART but also to other stakeholders regarding current ART knowledge, dispositions, and adherence. Additionally, the study reveals the optimism, valuing of self and health-seeking behaviors of a select group of Filipino HPH despite the struggles, which often make maintaining adherence over the long-term challenging.

Healthcare and public health providers need to be proactively involved to support sustained adherence and retention. On the policy realm, the outcomes of the study could serve as a basis to inform programs in the modification of lifestyles of this particular group, which may have the largest potential impact on

their health outcomes. It is vital to expand ART programs especially in less resourced settings wherein the delivery of services needs to be appropriately focused. Further investigation is warranted involving other professional groups who are on ART. Understanding the experiences, perceptions, and behaviors of health professionals living with HIV undergoing ART is crucial to adapting HIV treatment.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

CONTRIBUTIONS OF INDIVIDUAL AUTHORS

LRIC, RINDJ, CMLC, GMPC, and AVR contributed significantly to this research project especially in the conceptual, designing, empirical, and analytic phases. LRIC, RIMN, and AVR took part in disseminating the results and findings of the study by presenting the paper in different research fora. AVR did the revising and critically reviewed the paper. All authors approved the submission of this paper for potential publication.

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