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Individual and environmental determinants of adherence to antiretroviral therapy among people living with HIV in Ghana

Citation for published version (APA):

Abdulai, M. A. (2023). *Individual and environmental determinants of adherence to antiretroviral therapy among people living with HIV in Ghana*. [Doctoral Thesis, Maastricht University]. Maastricht University. https://doi.org/10.26481/dis.20230710ma

Document status and date:
Published: 01/01/2023

DOI:
10.26481/dis.20230710ma

Document Version:
Publisher's PDF, also known as Version of record

Please check the document version of this publication:

- A submitted manuscript is the version of the article upon submission and before peer-review. There can be important differences between the submitted version and the official published version of record. People interested in the research are advised to contact the author for the final version of the publication, or visit the DOI to the publisher's website.
- The final author version and the galley proof are versions of the publication after peer review.
- The final published version features the final layout of the paper including the volume, issue and page numbers.

Link to publication

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INDIVIDUAL AND ENVIRONMENTAL DETERMINANTS OF ADHERENCE TO ANTIRETROVIRAL THERAPY AMONG PEOPLE LIVING WITH HIV IN GHANA

MARTHA ALI ABDULAI

INDIVIDUAL AND ENVIRONMENTAL DETERMINANTS

OF ADHERENCE TO ANTIRETROVIRAL THERAPY AMONG PEOPLE LIVING WITH HIV IN GHANA

MARTHA ALI ABDULAI

The studies presented in this dissertation were conducted at the Kintampo Health Research Centre (KHRC), Ghana. Financial support was received from The Netherlands Fellowship Programmes (NFP), Kintampo Health Research Centre, Research and Development Division, Ghana Health Service, and Maastricht University. The NFP is initiated and fully funded by the Dutch Ministry of Foreign Affairs from the budget for development cooperation.

ISBN/EAN: 978-94-6469-435-2
Printed by: ProefschriftMaken.nl
Lay-out and cover by: Dennis hendriks | ProefschriftMaken.nl

INDIVIDUAL AND ENVIRONMENTAL DETERMINANTS

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DISSERTATION
to obtain the degree of Doctor at the Maastricht University,
on the authority of the Rector Magnificus, Prof.dr. Pamela Habibović
in accordance with the decision of the Board of Deans,
to be defended in public on Monday 10th of July 2023,
at 10.00 hours

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CHAPTER

1

General Introduction

Globally, an estimated 38.4 million people were living with HIV in 2021 (UNAIDS, 2022). Within the same period, 1.5 million people became newly infected with HIV, and 680,000 AIDS-related deaths were recorded (UNAIDS, 2022). The burden of HIV varies geographically; however, sub-Saharan Africa (SSA) accounts for over 60% of the global HIV burden and 60% of new HIV infections (UNAIDS, 2021). In Ghana, about 346,120 people were living with HIV in 2022 (Ghana AIDS Commission, 2023) out of a population of 30.8 million (Ghana Statistical Service, 2021), resulting in an HIV prevalence of 1.7% (Ghana AIDS Commission, 2023).

The Government of Ghana's recognition of the relevance of tackling HIV/AIDS as part of national development led to the establishment of the National Advisory Commission on AIDS (NACA) in 1985 to advise the Government on HIV/AIDS issures (Ghana AIDS Commission, 2010), the National AIDS Control Program (NACP) in 1987 as the technical lead for the health sector's response to HIV/AIDS in Ghana (Ghana AIDS Commission, 2005). Additionally, in 2002 the Ghana AIDS Commission (GAC) was established to co-ordinate HIV/AIDS programs and (Ghana AIDS Commission, 2005). The GAC and NACP work with key players, including governmental ministries, departments, and agencies, faith-based organizations, civil society organizations, non-governmental organizations, and the private sector, to scale up existing programs and use existing decentralized administrative structures to monitor and supervise HIV/AIDS activities.

Previous National HIV strategic frameworks by GAC and NACP for HIV prevention and treatment have met with significant successes, opportunities, and challenges as evidenced in an increase in the number of sites providing antiretroviral therapy (ART) from 79 in 2010 to 197 in 2018 (Ayisi Addo et al., 2018). Within the same period, the number of people living with HIV who have been put on ART increased from 38,000 to 97,494 in 2018. At the same time challenges in the identification and targeting of high-risk populations within the country were noted (Ghana AIDS Commission, 2021). Currently, the National Strategic Framework 2021–2025 guides HIV prevention and treatment in Ghana (Ghana AIDS Commission, 2021). The strategy maps out UNAIDS Fast-Track approach (UNAIDS, 2021) to accelerate the HIV/AIDS response over the next five years to reach critical HIV prevention and treatment targets and achieve zero discrimination. This "95-95-95 Fast Track Target" strategy has the following aims by the year 2030: 95% of all people living with HIV know their HIV status; 95% of all people diagnosed with HIV infection receive sustained antiretroviral therapy; and 95% of all receiving antiretroviral therapy will have viral suppression (UNAIDS, 2021). Key to the achievement of these global targets is strict adherence to ART.

The advent of highly active combination antiretroviral therapy (ART) in the mid-'90s was a profound turning point (Tseng et al., 2015). The implementation of ART has effectively transformed HIV from a once fatal disease to a chronic, manageable condition in settings where treatment is widely available (Deeks et al., 2013; Tseng et al., 2015). Worldwide, 72.9% of people living with HIV (PLWH) are on ART, with 90% of them being virally suppressed (UNAIDS, 2021). Adherence to ART is critical to HIV elimination efforts and results in better health outcomes and a higher quality of life for people living with HIV (PLWH). The estimated average life expectancy for PLWHs who initiate ART early and maintain long-term viral suppression is almost comparable with HIV seronegative individuals (Trickey et al., 2017). Adherence to antiretroviral treatment helps achieve an undetectable viral load, which reduces the transmissibility of HIV.

Sub-optimal adherence to antiretroviral medication regimen means that PLWH will not have sufficient concentrations of antiretroviral medication to reduce viral load, thus an increased risk of uncontrolled viral load, hence increasing the transmissibility of HIV and also the likelihood of drug resistance, treatment failure and increased healthcare costs (Mbuagbaw et al., 2012; Tchakoute et al., 2022; Lailulo et al., 2020). Resistance to the first-line treatment will mean a change to a more expensive second-line treatment, which increases the cost of treatment. Achieving maximal benefit from antiretroviral-based HIV treatment and prevention requires excellent adherence.

Adherence has been defined as the "extent to which patients take medications as prescribed by their healthcare providers" (Osterberg & Blaschke, 2005). The primary elements of medication adherence behavior have been described as initiation (starting a recommended regimen), implementation (executing the prescribed regimen), and persistence (length of time before discontinuation) (Vrijens et al., 2008). With about 27% of people living with HIV (PLWH) not using ART globally, there is a need for consistent ART intake to reduce the transmissibility of HIV and improve PLWH’s quality of life.

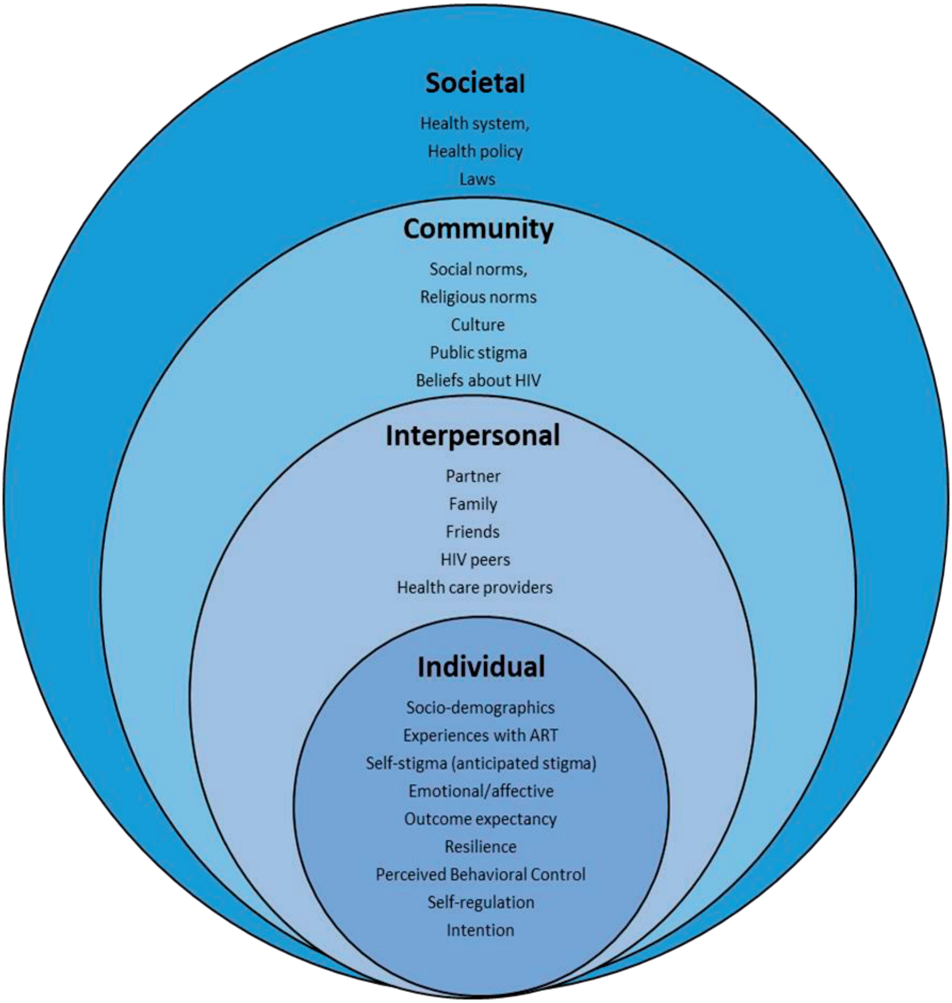
To target the problem of non-adherence to ART, it is important to get a clear picture of the individual and environmental determinants of antiretroviral treatment adherence. Indeed, for change to happen, a good understanding of the problem and its determinants would benefit the tailored changes required to improve the overall quality of life of PLWH.

Monitoring antiretroviral adherence among PLWH

The importance of adhering to antiretroviral therapy among PLWH cannot be overemphasized. Apart from ensuring adequate concentrations of ART agents for viral suppression, it also helps in lowering plasma viral load (Chesney, 2000). Accurate measuring and monitoring of ART adherence in patients on lifelong medications, such as PLWH, remains a challenge (Chesney, 2000; Mason et al., 2022). Many methods have been developed to measure adherence, with varying strengths and weaknesses. These methods include patient self-reports, simple pill counts, and the Medication Event Monitoring System (Chesney, 2000; Lucero et al., 2020). First, patient self-report is a subjective method that is commonly used for measuring medication adherence. It is cost-effective and flexible to use. It is, however, susceptible to recall bias, and patients may overestimate their adherence behavior by referring to their short-term medication intake. Second, simple pill counts, where patients return excess pills in their package for counting when visiting the ART clinic, provide concrete proof of their adherence behavior. Nevertheless, patients are likely to forget pill packages or dump pills to appear adherent, hence overestimating adherence (Chesney, 2000; Park et al., 2014; Rohatagi et al., 2016). Third, a Medication Event Monitoring System (MEMS) is a pill cap that contains an electronic microchip that records the date and time of each bottle opening (Lucero et al., 2020). MEMS keeps a record of each bottle opening as medication intake. The interpretation of these data assumes that a dose is taken each time the bottle is opened and may underestimate if the patient removes multiple doses at once or overestimate if the bottle is opened without ingesting a pill. Despite these limitations, these techniques provide useful insights into adherence measurements, and concurrent use of these methods may be the best approach (Anghel et al., 2019).

Conceptual Framework

The factors influencing antiretroviral adherence can be viewed through the lens of the socio-ecological model (UNICEF, 2015; Gumede et al., 2021). This model recognizes that individual, interpersonal, community and societal levels factors influence health behavior. The model explores the extent to which the different levels influence individual health decisions and behavior.



A Socio-Ecological Model for antiretroviral adherence- Adapted from Gumede et al, 2021.

Situating this study within the context of the Socio-Ecological Model, antiretroviral adherence behavior is influenced first by individual determinants related to socio-demographics (Azmach et al., 2019; Heestermans et al., 2016), psychosocial (Bos et al., 2008; Stutterheim et al., 2014), and socio-cognitive factors (Addo et al., 2022). The interpersonal level explores the relationship between the patient and other people in the individual's direct environment, such as partners, family members, HIV peers, and friends. The community level examines the environment within which social relationships occur, for example, neighborhoods, jobs, and health facilities. The last level looks at the wider societal factors that encourage or discourage medication adherence behavior. These include laws, policies, and sociocultural norms within which the PLWH lives. The Socio-Ecological Model emphasizes the fact that, individual intentions, health decisions, and behavior do not occur in a vacuum but are influenced by several players within the environment. This model helps us understand the multifaceted environment within which PLWH live and how their interaction within the environment influences medication adherence behavior.

In the following paragraphs the individual (e.g. age, gender, attitude, beliefs, and perceived behavioral control), interpersonal (e.g. healthcare providers' behavior, support), community (e.g. public stigma, beliefs, social and cultural norms); and societal factors (policies, religiosity; and spirituality) that influence antiretroviral adherence are discussed.

Individual-level factors of ART adherence among PLWH

Individual factors such as socio-demographics, experiences with antiretroviral medication intake, and psychosocial and socio-cognitive factors have been documented as personal determinants of antiretroviral adherence.

Systematic reviews that sought to identify and summarize the individual-level determinants of ART among HIV-positive adults in sub-Saharan Africa reported the association of socio-demographic factors such as age, gender; and educational status with medication adherence (Azmach et al., 2019; Heestermans et al., 2016). Generally, PLWH who were over 40 years of age were more adherent compared to younger individuals (Soomro et al., 2020). Females more than males were largely adherent to medications (Heestermans et al., 2016), though some studies reported the opposite (Dorcélus et al., 2020; Tegegne, 2021; Azmach et al., 2019). The literature suggests a mix of findings on the role of educational status on PLWH antiretroviral adherence. While some report that PLWH with no or low education were less adherent than those with formal education (Azmach et al., 2019), others reported that high education was related to non-adherence (Azmach et al., 2019; Heestermans et al., 2016; Kardas et al., 2013; Tegegne, 2021).

In addition to socio-demographic factors, PLWH's experiences with antiretroviral therapy are important predictors of adherence. Some PLWH experience challenges related to the medication. These include challenges related to dosing complexity, pill burden (for those taking more than one pill daily), side effects and dietary restrictions (Salleh et al., 2018). According to the evidence, patients on triple combination treatment had lower adherence than those on a two-drug regimen and even less complex regimens (Salleh et al., 2018; Altice et al., 2019).

Moreover, some psychosocial factors, including experienced stigma, depression, and anxiety, have been reported to influence medication adherence among PLWH. *Self-stigma* refers to the social and psychological effects of having a stigmatized condition. It comprises both the fear of becoming stigmatized and the possible internalization of the negative attitudes and feelings associated with the stigmatized condition (Bos et al., 2013). Self-stigma is a barrier to medication adherence as it increases PLWH depression, anxiety (Mbuagbaw et al., 2012), and self-esteem (van der Kooij et al., 2021). A study of Asian and Pacific Islanders living with HIV found high levels of internalized stigma. People living with HIV avoid seeking support because of internalized stigma, as they are afraid of disclosure and see themselves as unworthy of getting support (Dessie et al., 2019; Rice et al., 2017). Stigma also affects the psychological well-being of PLWH (Stringer et al., 2016). It also presents a major barrier to disclosure and the coping process (Kinzig et al., 2013).

Anxiety symptoms of PLWH have been documented to relate to doubts about the disease's advancement and clinical progress (Calvetti et al., 2014). PLWH are sometimes anxious about infecting their partners or children, suffering physical deterioration, or committing unintentional disclosure (Calvetti et al., 2014; Adeoti et al., 2019). They may also be anxious about implicit and explicit rejection, treatment failure or intolerance, changes in CD4+ T cell count and viral load, safe sex, and even death (Calvetti et al., 2014; Camara et al., 2019; Adeoti et al., 2019). PLWH may fear disclosing their HIV status or the fear of stigmatizing behaviors such as partner rejection, limiting sexual opportunities, or an increased risk for physical and sexual violence (Hossain & Kippax, 2011).

Depression is frequently linked with the presence of negative beliefs about HIV and feelings of hopelessness that affect PLWHs' motivation to take care of their health. It undermines the confidence and ability of PLWH to cope with the demands of ART treatment (Ücker Calvetti et al., 2014; Camara et al., 2019). PLWHs react differently to receiving their seropositive results (Kinzig et al., 2013). They use various forms of coping (i.e. problem, emotion, avoidant-focused, and religious coping), which serve as psychological resources in managing difficulties related to living with HIV (Lyimo et al., 2011).

PLWH who use problem-focused coping directly confront their diagnosis and reasonably appraise the HIV status. On the other hand, some PLWHs have the tendency to fall back on dysfunctional coping strategies such as alcohol and drug abuse (Kinzig et al., 2013; Turan et al., 2017; Velloza et al., 2020). PLWH who use emotion-focused coping strategy recognizes and alters the negative emotions that come with being HIV-positive, living with the condition and being on lifelong treatment. Other PLWH who use avoidant coping shun anything that reminds them of their condition. For example, their medications, the ART clinics, or reminders that inadvertently discloses their HIV status to others (Kinzig et al., 2013).

Besides psychosocial factors, socio-cognitive factors such as attitude, subjective norms, perceived behavioral control and self-regulation are key and modifiable behavioral determinants of antiretroviral adherence (Lyimo et al., 2011). As postulated by the theory of planned behavior (Ajzen, 1991; Ajzen & Madden, 1986), the intention to perform any behavior precedes its actual performance, given that people have the skills and do not have barriers that hinder the behavioral execution process. The intention in turn is influenced by attitudes, subjective norms and perceived behavioral control. Applied to antiretroviral adherence, PLWH intentions are higher when they are positively inclined to adhere to antiretrovirals (attitude), perceive that important people around them approve of antiretroviral adherence (subjective norm), and have the confidence and perceive satisfactory autonomy to make their personal decision (perceived behavioral control) (Ajzen, 1991; Ajzen & Madden, 1986).

Interpersonal factors influencing treatment adherence

A good relationship between people living with HIV (PLWH) and healthcare providers (HCP) can motivate PLWH to adhere to their antiretroviral therapy (Stone et al., 1998). Stigmatizing attitudes of HCP have been associated with missed opportunities for HIV treatment (Vorasane et al., 2017). A study conducted among PLWH showed that primary-care providers were judgmental and stereotyping in their delivery of care (Schilder et al., 2001; Stutterheim et al., 2014; Watts & O'Byrne, 2019). PLWHs who experience such behaviors from HCP are likely to avoid visiting the facility or not come back for their refills. The characteristics of HCP that have been reported to influence stigmatizing attitudes and behaviors of the HCP include a lower level of education, societal norms, religious and cultural beliefs, the professional category of healthcare provider, direct contact experience with PLWH, availability of pre-exposure prophylaxis (PEP), knowledge on transmission and prevention of HIV, and HIV/AIDS-related training (Harapan et al., 2015; Stringer et al., 2016). Some studies have suggested that HCP professional category predicts their stigmatizing attitudes and behavior (Langi et al., 2022; Vorasane et al., 2017) with nurses reporting higher levels of stigma than physicians do. However, another study reported no relationship between professional category and stigma (Stringer et al., 2016). Furthermore, some studies suggested that HCP who have more contact with PLWH and higher HIV-infected patient loads have less stigma and more positive attitudes toward PLWH (Feyissa et al., 2012), though one study found no association between high HIV-infected patient loads and stigma towards PLWH (Stringer et al., 2016).

It is important to note that even though PLWH may anticipate stigma, they do not always experience it. A study of adult PLWH found that those who thought HCP were intolerant of PLWH avoided or delayed clinic visits and may suffer the consequences of poor adherence (Li et al., 2007). Furthermore, the behavior of HCP may be influenced by a lack of clear policies on non-judgmental and non-stigmatizing care delivery (Kinzig et al., 2013).

Social support may help patients remain active in their care when faced with physical, social, and economic vulnerabilities (Fernández-Peña et al., 2022). Social support from family, friends, and HIV peers is relevant for adherence and an essential aspect of coping and commitment skills for improving adherence to ART. Indeed, strong social support from family, friends, and peers encourages positive personal relationships and improves the experience and acceptance of the disease and its treatment (Fernández-Peña et al., 2022; Peltzer et al., 2010). Patients receiving support from family members may feel a greater sense of self-worth (van der Kooij et al., 2021), and this can encourage optimism about treatment. Furthermore, providing patients with adequate social support and engagement with their families improves the quality of their lives and encourages the adoption of beneficial health activities such as medication adherence (Peltzer et al., 2017; Shahin, Kennedy, and Stupans, 2021). This is because family members regulate each other's behavior and provide information and encouragement to behave in healthier ways and more effectively utilize healthcare services. In contrast, when PLWH experiences negative interactions with family, friends, and peers, it compromises adherence. Caiola and colleagues (2018) report that inadequacy or a lack of social support results in aspects of medication non-adherence. Some studies in Nigeria and the USA (Adisa et al., 2017; Spikes et al., 2019) found no association between family support and medication adherence.

Community factors influencing treatment adherence

Public stigma has been shown to influence antiretroviral medication adherence (Corrigan & Watson, 2002; Stutterheim et al., 2014; Subu et al., 2021). The term "public stigma" refers to the community's reaction to PLWH; the emergence of the HIV epidemic brought with it fear, anger, and a lack of pity or compassion among the world's populations (Bos et al., 2013). This has resulted in stigmatization and discrimination toward PLWH. Public stigma includes the cognitive, emotional and behavioral reactions of individuals who stigmatize the stigmatized (Bos et al., 2013).

The origin of public stigma lies in the cognitive representations community members hold regarding PLWH. Cognitive representations regarding PLWH are onset controllability, perceived norm-violation, perceived contagiousness and perceived severity (Herek & Capitanio, 1999; Bos et al., 2013).

High levels of attributed personal responsibility for the onset of HIV, for instance, evoke anger and stigmatizing behavior as would be the case with an HIV positive commercial sex worker, whereas low levels of personal responsibility would yield feelings of sympathy as in the case of a child born HIV-positive (Herek & Capitanio 1999; Bos et al., 2013; Stutterheim., et al., 2014). Again, perceptions of norm violation are positively related to anger and social exclusion and negatively related to sympathy and empathy. Norm-violation is important in the stigmatization of people with HIV, as traditionally HIV has been associated with promiscuity, prostitution and homosexuality, all of which are still considered deviant in our settings (Herek & Capitanio 1999; Bos et al., 2013). High levels of perceived contagiousness or dangerousness of HIV cause fear and avoidance in those who sense it. For example, the fear of contracting HIV through casual social interaction, and its association with death and wasting persist and people avoid PLWH (Stutterheim et al., 2014; Bos et al., 2013). The perceived severity of the illness is another representation. People with high degrees of perceived severity elicit both anxiety and pity in perceivers, and the simultaneous presence of both emotions can cause emotional uncertainty and awkward encounters. This is common with "deadly" conditions like HIV.

Applied to antiretroviral adherence, PLWH acceptance of the cognitive representations of onset controllability, perceived norm violation, perceived contagiousness and perceived severity in the community make it difficult for them to freely and openly disclose their HIV status and visit ART clinics for refills, hence non-adherence. Public stigma affects PLWH adherence to antiretroviral therapy in a number of ways and across various settings. For example, these stigmatizing behaviors occur within the family, friends, peers, acquaintances, healthcare, and religious settings (Abdulai et al., 2022; Tran et al., 2019). Based on these cognitions of public stigma, stigma manifestations including avoidance, rejection, abandonment, denial of care and services, awkward social interactions, being advised to conceal HIV status and being treated a bit too special are prevalent (Stutterheim et al., 2009; Bos et al., 2013; Abdulai et al., 2022). PLWH are often aware of these stigmatizing behaviors and fear the negative reactions of people in their social circles. For this reason, PLWH may live in constant fear of the secret being revealed and would protect it at all costs. For example, a PLWH who is afraid of negative reactions may not take their medication when it is time to take the medication to avoid inadvertent disclosure.

Societal factors influencing treatment adherence

Structural stigma enabled by social, political, and economic powers influences antiretroviral medication adherence (Feyissa et al., 2012; Stringer et al., 2016). Structural stigma is the "justification and perpetuation of a stigmatized status through society's institutions and ideological systems" (Bos et al., 2008; Bos et al., 2013).

Effective *policy implementation* is essential for achieving desired policy outcomes. Policies are potential external determinants relevant to ART adherence in Ghana. Policy stakeholders play a key role in giving policy-related support and direction for implementation in ART clinics. They make decisions for the adoption and implementation of policies for HIV treatment. Both policy and supply-related institutional support help in effective policy implementation. Policy-related institutional support, including education and HIV training, is needed to provide the requisite skills and knowledge for treating patients. Supply-related institutional support focuses on the provision of drugs, logistics, supplies, and budgets for HIV care. Research showed that both lower perceptions of policy-related and supply-related institutional support were predictors of stigmatizing behavior in Ethiopia (Feyissa et al., 2012; Stringer et al., 2016).

Additionally, *societal norms*, including cultural norms, influence health behavior. Previous studies suggested that culture had both positive and negative impacts on health behavior (Ahola, 2015; Shahin et al., 2019; Termsirikulchai et al., 2016; Wahab et al., 2021; Waterworth et al., 2015). Wannasirikul and colleagues (2016) suggest that cultural factors shape patients' perceptions and beliefs regarding health behaviors. Mah and Halperin (2010) note that multiple concurrent partnerships and polygamy are cultural phenomena in sub-Sahara Africa. This phenomenon not only increases the risk of transmission in the sexual network but also creates a common problem of non-disclosure that challenges clinic visits and non-adherence. Individuals in sub-Saharan Africa have diverse cultural values that differ from western medical beliefs. The belief that ART does not treat all dimensions of HIV but needs to be complemented with traditional medicines for cure also hinders antiretroviral adherence (Merten et al., 2010; Pan et al., 2019).

In addition to culture, *spirituality and religiosity* are increasingly identified as influencing health and treatment (Kretchy et al., 2013). A systematic review of spiritual and religious beliefs on medication adherence demonstrated a significant effect of the former on medication adherence (Shahin et al., 2019). Some studies point to the fact that participants largely perceive various chronic illnesses such as HIV (Abdulai et al., 2022), hypertension, and diabetes (Ashur et al., 2015) as the will of God and, as such, anticipate divine healing outcomes (Kretchy et al., 2013; Wahab et al., 2021). These beliefs seem to motivate some participants to adhere to their medications (Wahab et al., 2021). In contrast, Abel and Greer (2017) reported no significant association between religiosity and medication adherence.

The present studies

The efforts of the Ghana AIDS Commission have contributed to Ghana exceeding the 95% target of people living with HIV who are on ART. Even though 96% of PLWH were sustained on ART, only 73% showed viral suppression as a result of the treatment they received (Ghana AIDS Commission, 2019), which is well below the 95% target. Again, although multiple studies on the determinants of ART adherence have been conducted in sub-Saharan Africa, including Ghana, the region is diverse in terms of culture, work ethics, the healthcare system, and infrastructural challenges and strengths. This diversity may result in unique factors that may influence or challenge ART adherence, requiring contextualized approaches to addressing them. Additionally, there has been little research on the contextual factors influencing ART adherence among PLWH in Ghana. So far, the available publications on treatment adherence among PLWH in Ghana have focused on adolescents (Ankrah et al., 2016; Nichols et al., 2019) and used a quantitative approaches with an emphasis on individual-level characteristics (Obirikorang et al., 2013; Ohene & Forson, 2009) with limited data on the environmental-level factors both of which are key for PLWH adherence to ART.

To fill the gap, there is still a need for a comprehensive and up-to-date understanding of individual and environmental determinants of ART adherence among PLWH, with a view to sustaining PLWH on lifelong ART and achieving viral suppression. The studies reported in this dissertation seek to investigate the factors that influence antiretroviral adherence at the individual (PLWH) and environmental (interpersonal, community, and societal) levels (HCP and policy stakeholders). Insights from these studies could be used to develop theory- and evidence-based interventions to improve ART adherence among people living with HIV in Ghana.

This dissertation presents the results of five empirical studies with the overarching goal of finding the individual and environmental determinants of ART adherence among people living with HIV (PLWH) in Ghana toward the global goal of eliminating HIV by 2030. The **first study (Chapter 2)** is a qualitative analysis of factors influencing antiretroviral adherence among PLWH in Ghana. The aim of this study was to explore the individual and environmental factors influencing ART adherence among PLWH in the Bono East Region, in the middle belt of Ghana, using qualitative interviews and focus group discussion (FGD). This study employed 20 semi-structured in-depth interviews and three FGDs with 29 PLWH visiting one of three antiretroviral clinics. The thematic analysis included PLWH clinic visits, knowledge, attitudes, and self-efficacy related to ART adherence, psychological well-being, and stigma. In the **second and third study (presented together in one paper in Chapter 3)**, I explored the behavior of healthcare providers working in ART clinics (AHCP; frequent interactions with PLWH) and those working in the general healthcare setting (GHCP; less interaction with PLWH) towards PLWH. This study qualitatively explored and compared the individual and external factors influencing AHCP and GHCP behavior towards PLWH. This study employed a semi-structured interview approach to guide individual in-depth interviews with 33 randomly selected HCPs (nurses, physicians, and biochemist). The interview protocol was informed by the empirical literature and included topics such as perceptions and experiences working with PLWH, HIV-related risk perception, HIV-related training received, knowledge about HIV, emotions towards PLWH, institutional, supervisors, and collegial support related to patient care. Thematic analysis was used to analyse the interview data. The **fourth study (Chapter 4),** explored the individual and environmental factors influencing stakeholders' HIV treatment policy implementation in Ghana using qualitative, semi-structured, in-depth interviews among fifteen HIV policy stakeholders (in different management positions) towards improving HCP non-stigmatizing behavior towards PLWH to improve ART adherence. The **fifth study (Chapter 5)**, which is a 6-month prospective study, was guided by the findings of study one **(Chapter 2)** and the literature review. This study assessed the relative importance of earlier identified psychosocial constructs in the prediction of adherence intention and behavior among 750 people living with HIV in the Bono and Bono East regions of Ghana. PLWH were enrolled at baseline and followed up at three-time points at 2-monthly interval. At baseline, PLWH provided socio-demographic information and for each follow-up visit, they received an interview on psychosocial factors (intention, outcome expectancy, resilience, self-regulation, and anticipated public stigma towards medication adherence). Finally, **chapter 6** summarizes and discusses the major findings of the five studies in the antiretroviral adherence literature. This chapter includes reflections on the research approaches used, recommendations for practice and future research, practical implications of the study findings for intervention and concluding remark

CHAPTER

2

A qualitative analysis of factors influencing antiretroviral adherence among persons living with HIV in Ghana

Manuscript Published as:
Abdulai, M. A., Mevissen, F. E.F, Ruiter, R. A.C., Owusu-Agyei, S., Asante, K. P., & Bos, A. E. (2021). A qualitative analysis of factors influencing antiretroviral adherence among persons living with HIV in Ghana. *Journal of Community & Applied Social Psychology.*
doi: https://doi.org/10.1002/casp.2551

Abstract

Adherence to antiretroviral therapy (ART) remains an important factor in HIV prevention and treatment efforts. We explored the individual and environmental factors influencing antiretroviral adherence among PLWH in Ghana. This study used 20 semi-structured in-depth interviews and three focus group discussions (FGD) involving 29 PLWH attending one of three antiretroviral clinics. Thematic analysis covered experiences of PLWH clinic visits, knowledge, attitudes, self-efficacy related to ART adherence, psychological well-being and stigma. The findings suggest that both individual and environmental factors including treatment outcome, coping skills, disclosure, self-regulation, healthcare-provider interaction, family and partner support, organization of ART clinics, stigma, and transportation cost influenced treatment adherence. Interventions that empower PLWH and reduce HIV-related stigma in the community will most likely support antiretroviral adherence.

Introduction

The availability of antiretroviral therapy (ART) for Persons Living with HIV (PLWH) has changed the dynamics of living with HIV (human immunodeficiency virus) and its treatment. The 'Treat All Policy' further enhances current HIV prevention, treatment, and care. This policy requires that, unlike previously where CD4 (white blood cells that fights infection and an indicator of immune function) was used as an indicator for starting antiretroviral treatment, immediately a person is tested HIV positive, this person should receive ART irrespective of the CD4 count (UNAIDS, 2019). In Ghana, an estimated 342,307 people were living with HIV in 2019 out of a population of about 31,072,940 with an HIV prevalence of 1.7% and 46% were on antiretroviral therapy (Ghana AIDS Commission, 2020). The National Strategic Framework (2021-2025) seeks to ensure that by the year 2025; 95% of all persons living with HIV know their HIV status; 95% of all people diagnosed with HIV infection receive sustained antiretroviral therapy, and; 95% of all receiving antiretroviral therapy will have viral suppression. Ghana is currently using triple therapy for HIV treatment. The recommended triple therapy regimens are two Nucleoside/tide Reverse Transcriptase Inhibitors (NRTIs) and one Non-Nucleoside Reverse Transcriptase Inhibitor or two NRTIs and one boosted Protease Inhibitor (Ghana AIDS Commission, 2020).

Adherence to ART reduces disease progression and drug resistance (Lucas et al., 1999), increases life expectancy, reduces HIV transmissibility as well as well-being among PLWH (Katz & Maughan-Brown, 2017; Teeraananchai, Kerr, Amin, Ruxrungtham, & Law, 2016). Adherence is the 'extent to which patients take medications as prescribed by their healthcare providers' (Osterberg & Blaschke, 2005). The primary elements of adherence are; starting a recommended regimen, completing the prescribed regimen, and staying on the medication for the length of time allotted before discontinuation.

A meta-analysis of ART adherence studies conducted in sub-Saharan Africa estimated an adherence rate of 77%, which is below the optimal adherence of 95-100% (Mills et al., 2006). Studies in Tanzania and Eastern Ethiopia estimated adherence of 63.7% and 85.6% respectively (Achappa et al., 2013; Jima & Tatiparthi, 2018; Semvua et al., 2017), while some studies in Ghana reported an ART adherence of 60% to 80% (Obirikorang, Selleh, Abledu, & Fofie, 2013; Ohene & Forson, 2009). A comparative analysis of adherence in some African and Asian countries reported adherence of 92.7% to 95.2% respectively (Bijker et al., 2017). Sub-optimal adherence (i.e. adherence below 95%) is associated with a change from the standard treatment to more expensive treatment options and an increased likelihood of treatment failures (Ickovics et al., 2002).

To intervene on sub-optimal adherence, it is necessary to understand what factors influence correct and consistent adherence to ART among PLWH. The socio-ecological model recognises that the factors influencing health behavior span through individual, interpersonal, community, and societal levels (Williams, Renju, Ghilardi, & Wringe, 2017).

Individual factors including socio-demographic (Croome, Ahluwalia, Hughes, & Abas, 2017; Gugsa et al., 2017) as well as psychosocial factors are shown to influence ART adherence (Ankrah et al., 2016; Dima, Schweitzer, Diaconiţ, Remor, & Wanless, 2013; Mills et al., 2006; Shubber et al., 2016; Weiser et al., 2003). Religion is a facilitator when the belief in a deity serves as a coping strategy for medication uptake; nevertheless, it becomes a barrier when the belief informs PLWH decision to reject medication e.g. PLWH who turn to believe in deity's power to cure infection may refuse to take ART (Kretchy, Owusu-Daaku, & Danquah, 2013). Self-efficacy influences the adherence behavior of PLWH in that when a patient has low self-efficacy, (s) he may doubt her/his confidence to adhere to medication towards viral suppression. Those with low self-efficacy are also more likely to hide their HIV status (Dima et al., 2013; Rodkjaer et al., 2014)

In addition, PLWH who is not satisfied with his/her treatment are likely to make individual decisions not to adhere to medication without consulting their healthcare provider. The fear of stigmatization, mistreatment at work and social circles reinforces concealment of HIV status and affects medication adherence. This is because PLWH will have to ensure secrecy when taking medication, which is not always possible (Azia, Mukumbang, & Van Wyk, 2016; Gourlay et al., 2014). When PLWH are under the constant fear of being identified as HIV patients, they are likely to be depressed and anxious (Bijker et al., 2017; Shubber et al., 2016). Psychological distress can have a toll on their quality of life and medication adherence (Bijker et al., 2017). Additionally, when PLWH has insufficient access to safe and nutritionally adequate food, which is essential for the body to respond to antiretroviral therapy, medication intake and adherence may be compromised. Health-behavioral theories (Ajzen, 1991; Bandura, 1977; Rosenstock, 1977) support these individual factors in explaining treatment non-adherence. *Interpersonal factors* were also reported as barriers to ART adherence (Heestermans, Browne, Aitken, Vervoort, & Klipstein-Grobusch, 2016; Mayanja et al., 2013). Often PLWH decides not to disclose their HIV status to their partners or family members for fear of their negative reactions such as verbal abuse and abandonment. The decision not to disclose their HIV status undermines the support they could get from their family members or partners (Adeniyi et al., 2018; Gugsa et al., 2017). Social support, which refers to the psychological and tangible resources PLWH receives from their social network (Cohen & Wills, 1985a), is relevant to the overall well-being of PLWH. This support reduces depression (Tsai et al., 2012), improves medication adherence, coping, and quality of life of PLWH (Katz et al., 2013).

Globally, *community factors* related to ART adherence are mostly ART facility-related factors (Ankrah et al., 2016; Azia et al., 2016; Ganle, Parker, Fitzpatrick, & Otupiri, 2014; Heestermans et al., 2016; Mayanja et al., 2013; Mwamba et al., 2018; Shubber et al., 2016). The healthcare provider may be the only one who knows the HIV-status of PLWH. As such, the relationship between the healthcare provider and the patient is crucial to the patient antiretroviral adherence. A patient who enjoys a good relationship with healthcare providers has better adherence and vice-versa (Ganle et al., 2014; Mwamba et al., 2018). PLWH who keep their clinic appointments are likely to adhere to medication. In resource-constrained settings, this comes at a cost to the patient: cost of transport, cost of foregoing daily income- generating activities, and some unexpected cost at the clinic. When PLWH are not in the position to manage these costs, they will miss their appointments for a refill.

Within all the levels of the ecological model, HIV-related stigma plays a role, thus affecting medication adherence (Dovidio, Major, & Crocker, 2000). PLWH, especially those in developing countries, often live in communities where negative norms related to being PLWH exist. These norms could be internalised by PLWH. Community members' perceptions of how they were infected will inform their decision to be either empathetic or aggressive towards PLWH. These stigmatizing responses in turn influence adherence (Bos, Pryor, Reeder, & Stutterheim, 2013).

Societal factors that influence adherence are evident in laws and policies in many countries (Csete & Dube, 2010; Ferguson et al., 2018; Health Policy Plus, 2017; Laar & Debruin, 2017). Even though these factors are beyond the scope of this paper, it is worth mentioning that the Ghana AIDS Commission Act 938 has anti-discriminatory laws for persons living with and affected by HIV (Health Policy Plus, 2017), however, there are punitive laws for key populations which may serve as a barrier to ART adherence (Laar & Debruin, 2017). Anecdotal evidence suggests that these restrictive laws are barriers to accessing HIV care and treatment.

PLWH antiretroviral adherence is influenced by factors that may overlap but can also vary across different regions of the world (Croome et al., 2017; Mills et al., 2006; Ware, N. C., Idoko, J., Kaaya, S., Biraro, I. A., Wyatt, M. A., Agbaji, O., … Bangsberg, 2009). Although the literature review shows several scientific publications on this topic, there is limited research on the context-specific factors influencing ART adherence among PLWH in Ghana. The available publications on treatment adherence among PLWH in Ghana so far focus on adolescents (Ankrah et al., 2016; Nichols et al., 2019) and used a quantitative approach (Obirikorang et al., 2013; Ohene & Forson, 2009) with emphasis on individual-level factors. To fill this gap, our study sought to explore the individual and environmental factors influencing ART adherence of PLWH in the Bono East Region located in the middle belt of Ghana using qualitative interviews and focus group discussions. A clear understanding of the perspectives of PLWH on factors influencing medication adherence in Ghana will contribute to the literature, and the development of targeted evidence-informed interventions for optimal treatment and health outcomes.

Materials and methods

Study design

A qualitative semi-structured interview protocol was used to guide both in-depth individual interviews (IDI) and Focus Group Discussions (FGD) to explore the factors influencing antiretroviral treatment adherence of PLWH. The use of a semi-structured interview guide allowed us to adapt to the course of the conversation, respond to social cues and permit the participants to express their opinions while maintaining consistency across the different interviews.

Study setting and site selection

The Bono East Region is one of sixteen administrative regions in Ghana. The region has 11 districts and over 40 health facilities that provide health services to its inhabitants. HIV prevalence in this region is 1.43% (Quaicoe Rebecca, n.d.). Interviews were conducted in Kintampo South District, Kintampo North and Techiman South Municipality.

We purposively selected three ART clinics that attend to a PLWH- registered population of 4237. Their strategic locations within the region, the set-up similarities for ART clinics in Ghana, the size of the clinic, and its organisation (stand-alone versus integrated) informed the selection of these facilities. The ART clinics are located within the Kintampo North Municipal hospital, Kintampo South District hospital, and Holy Family Hospital, Techiman.

Participants

In total, 49 PLWH participated in the study, 20 in IDIs and 29 in FGDs. The mean age of participants was 38.3 years (*SD* =10.3, range 23-58). The participants were mostly females (81.6%). Most participants (59.1%) had some form of education. Near 45% of PLWH were married and 55% were unmarried. Most of the participants were Christians (90%); the remaining 10% either were Muslims or had no religion. Of the participants 39% were farmers, 37% were traders (yam sellers, cosmetic sellers) and 22% were unemployed. The participants in this study had been living with HIV for two to 12 years.

Study procedures

We asked adult PLWH who were queuing at the ART clinic to participate in a 30-60min interview. If they were willing, we confirmed the eligibility criteria (age 18+) and gave information about the study. The average number of PLWH visiting these ART clinics in a week for either refills or general consultation was 20. We explained individually to participants that the study was exploring PLWH perspectives and experiences with antiretroviral uptake and hospital visits. We assured potential participants of confidentiality, the voluntariness of participation, and the right to withdraw from the study at any point in the study. Those who agreed consented right after their consultation and refill. Before starting the IDI/FGD, written Informed consent was obtained from each participant in advance of the IDIs and FGDs after the aim, objectives, and procedures of the study were once more explained. A signature or thumbprint from each participant was printed on each written Informed Consent with a copy on file and another copy provided to the participant who was willing to keep a copy. In total, 23 PLWH were approached for the IDI of which 20 agreed to participate (75% female). Two PLWH refused to participate in the IDI due to other engagements. We achieved saturation by the 18th interview; two additional interviews were conducted after which we ended recruitment. After finishing all 20 IDIs, models of hope (HIV+ peer models) invited PLWH to participate in FGD according to the same procedure as described above. Models of Hope are trained persons living with HIV who provide adherence counseling and track defaulters. They are mostly people with lived experiences. Models have gone through the process of starting antiretroviral therapy and understand the challenges newly diagnosed clients face with issues related to stigma and discrimination. They are more effective in reintegrating defaulters. Three participants from the Kintampo site were recruited via phone: because their medication was mostly home-delivered by the models of hope. All twenty-nine approached agreed to participate in one of the three FGDs.

All IDI's were conducted within the hospital premises in an unused room that ensured the privacy of the participants. The FGDs were conducted at an unused children's clinic, a vacant reproductive health room, and a vacant adherence counseling room. Some nuances that emerged from IDI were further explored in the FGD. The three FGDs had six (one male, five females), six (one male, five females) and seventeen (three males, fourteen females) PLWH respectively. Although we recognise 17 to be a large group, we could not divide the group due to practical issues. Nonetheless, we organised the discussion such that, each participant was able to talk during the discussion.

The lead author, together with a social scientist from the Kintampo Health Research Centre, moderated the interviews and discussions. We conducted all interviews in Twi (the local language spoken by all of the participants). All the participants received a bar of key soap as a thank you package for their time and voluntary willingness to participate in the study. Focus Group discussants in addition to the key soap received a soft drink and a pastry after the interviews.

Study materials

The interview protocol was semi-structured and guided by literature review and theoretical concepts explaining factors influencing ART adherence including experiences with ART adherence and clinic visits. The protocol was discussed with relevant stakeholders in the field of HIV prevention, care, and treatment. The interview protocol was structured according to themes including experiences with treatment and adherence and experiences at the ART centers. Each theme included follow-up questions for further exploration of factors such as knowledge, attitudes, self-efficacy related to antiretroviral therapy, psychological well-being, and stigma.

Data management and analysis

All digital audio recordings were transcribed verbatim and translated from the local language into English. Twenty-five percent of the transcripts were double-checked by the lead author to confirm the translation. We checked for the validity of the data by triangulation using IDI, FGD, and different interviewers. The transcripts were entered into the software program Atlas Ti version 8 for analysis.

The first and the second author coded three interviews together. Any different opinions on the coding were discussed until we reached an agreement. The first author coded the remaining interviews. The first and the second author did all summaries together and discussed any nuances. We used inductive thematic analysis that allows for the identification, analysis, and reporting of common themes within the qualitative data. The use of this method allowed us to develop codes and themes based on the content of the data (Boyatzis, 1998).

We analysed the data by carrying out open, selective, and theoretical coding at three levels: at the initial coding level all transcripts were read to identify general themes emerging, these themes were grouped into smaller themes at the second level. Levels one and two codes were reviewed at the third level to develop the major thematic categories. Reports were generated for each thematic category and reviewed. All quotes that did not fit the selected code were recoded from that category into its appropriate category. Other emerging themes that were peculiar to some transcripts were then added. The summaries for all categorised themes have been presented as results for exploring the factors (individual and environmental) influencing antiretroviral treatment adherence of Persons Living with HIV in the Bono East Region of Ghana.

Ethical approval for the conduct of the study was obtained from the Institutional Ethics Committee (IEC) of the Kintampo Health Research Centre (FWA00011103) and the Ethical Review Committee Psychology and Neuroscience at Maastricht University (ECP_04_09_2012_S22). Permissions were received from the Medical Superintendents of the selected hospitals to carry out interviews in their facilities.

Results

First, we report on the adherence behavior of the participants. This is followed by the determinants that influence ART adherence grouped into two categories: individual and environmental (including interpersonal and community factors).

Adherence behavior

Most of the participants had been on ART for the past five years at the time of data collection. Irrespective of age, PLWH revealed that they take ART because their life depends on it. While most indicated they never skipped their medication, a few others said they sometimes forgot to do so because they were preoccupied with their jobs.

Individual factors

Self-Regulation for ART adherence

All participants in the IDIs and FGDs indicated that they could take their medication without any difficulty. They were able to take the medication with ease as prescribed by the healthcare provider. They used self-regulation strategies like using a different pill bottle when traveling (to avoid stigma), or memory cues such as putting the medication in clear vision (e.g. table), incorporating it as part of their daily schedule by using wake-up and bedtimes or breakfast and dinner times.

'No sister [it is not difficult], once we eat every day taking the medication is as easy as that' (30-year old IDI participant).

Outcome efficacy of ART treatment

All PLWH indicated that their condition has improved since they started taking the antiretroviral. They are optimistic that if they continue to take antiretroviral, they will no longer die from HIV; it makes them look very healthy, stronger, and able to work and therefore reduces potential HIV-related stigma. For most PLWH, the improved health status has helped to conceal their HIV status. Altogether, IDI and FGD participants corroborate that, the fast and visible improvement in health is one of the major drives for treatment adherence:

'Oh, the medication is very good. If I say it is not good, I would be lying. Apart from God who gives me life, it is my God. I was not like this. I was wasted. However, upon taking the medication, I am fit….' (28-year-old female IDI participant)

Interestingly one participant said even though ill health reduced she noticed that the antiretroviral made her chronically weak and has affected her daily activities.

'Ever since I started the medication (ARV), I have never been able to go to the farm. I am chronically weak' (32-year old female FGD participants)

Another participant indicated that the efficacy of the antiretroviral helped him to abort any plans of committing suicide.

'My recovery from frequent ailments after taking the antiretroviral motivated me to discard the idea of poisoning myself. Before I started the antiretroviral, I went to the hospital severally without recovery until my brother came from Britain and took me to the hospital' (45-year-old male IDI participant)

Side effects of ART medication

Most participants said they had experienced side effects especially at the start of taking the antiretroviral. Some participants mentioned side effects such as dizziness, weakness, diarrhea, skin rashes, nightmares, palpitation, confusion, and vomiting.

'I started the ARV for two weeks, when I began, my legs were swollen and oedematous, and I was bedridden for 6 months. I was admitted at the hospital for 3 months to take the fluid from my thigh. It took the intervention of both local and foreign doctors to survive...Since then I have never experienced any side effects. For that particular antiretroviral that gave me this side effects, no matter what I will not take it' (33-year old female IDI participant)

Some participants said healthcare providers warned them about the side effects. The side effects diminished after a while or upon complaining to the healthcare provider, they changed the medication. In general, it seems that the side effects did not stop them from taking the medication.

Knowledge about HIV and ART

Most PLWH who were knowledgeable about the causes, treatment, and management of HIV, (learned it either through counseling, training from health facilities, or various courses related to HIV) were inclined to understanding HIV transmission and antiretroviral intake. This seemed to help them with ART uptake.

'What helped me most was that in the same year that I was diagnosed, there was an opportunity to do a course in HIV at the University of Ghana… This exposed me to a lot of information on HIV and I learned many things' (56-year old male FGD participant).

Anticipated stigma

The majority of participants in both IDI and FGD said that they believe that when their community members or family knows their HIV status they will devalue them. A few participants felt family members may even laugh at them if they came to know. For the majority of the PLWH, the fear of stigma makes them travel to other ART centres far away, from where they stay to get antiretroviral medication.

'Stigma is still high; it is the main reason why PLWH will rather pick their medication from an ART far away... Some even go as far as Kumasi because of the stigma' (33-year old female IDI participant).

Although quite a few participants mentioned real stigma experiences, it appears that the majority of PLWH have not experienced public stigma but have a strong fear it could happen.

Disclosure versus non-disclosure

The majority of the participants in IDI and FGD had informed only one person about their HIV- positive diagnosis. Most PLWH said that people who they disclosed to did not judge them but empathized. PLWH mostly disclosed to their spouses, parents, or siblings. Reasons for disclosure included trustworthiness of the person, the need for financial, or emotional support to regularly come for antiretroviral refills or feeling obliged to disclose because of the visibility of the infection.

Some reasons ascribed to non-disclosure were a strong fear for the other persons' response (gossip, maltreatment, and abandonment), not needing help and the fact that their health is a personal matter.

'When I was diagnosed with HIV, I was not worried about my diagnosis; I was rather worried about how my wife will maltreat me and how unhappy she will make me if she came to know' (34-year old male FGD participant).

To avoid stigma or disclosure, some PLWH resorted to disguising the medication bottles, hiding the antiretroviral, or denying or lying about their HIV status.

Fear of recognition at ART clinic

PLWH in both IDI and FGD were afraid to be identified as HIV patients when visiting the clinic for fear of gossip. This fear influences clinic attendance; hence pill refill and antiretroviral adherence.

'As for the location, hmm it is difficult especially when you start off from the hospital entrance. The moment you start coming towards the facility everyone knows what is wrong with you' (24-year old female IDI participant).

Role of religion

Both IDI and FGD participants positively reappraised their purposes in life post-HIV positive diagnosis because they believe in God and ART. While others believe that they are still alive by the Grace of God, others depend on their relationship with God to ignore stigmatizing attitudes of other people. Some PLWH also believed that HIV is from a deity as such they are predestined to have HIV. PLWH believes that ART is efficacious because God allowed it.

'…I think everything is by God. All you need is to cast all your burdens on God. If I look at the medication, without God it will never work. I look up to God alone. God is my only hope. No man can help me but only God' (30-year old female IDI participant).

Coping with HIV

Most PLWH in IDI who accepted their HIV positive status focused on how to deal with it. Some PLWH compared HIV to other chronic conditions like hypertension and diabetes and took solace in the fact that living with HIV is more manageable than hypertension and diabetes.

'…. Any illness can kill someone. If you have HIV and you take your medication, it is better than having diabetes. I think diabetes is more dangerous than HIV' (36-year old female IDI participant)

They mentioned that with antiretroviral, PLWH could live their lives to the fullest without any problems; they can have children who are HIV negative and very healthy despite their HIV positive status. For others, knowing that they are not the only ones living with HIV makes them accept their condition.

Environmental factors

Response and support from family and friends

Although most participants indicated that the person to whom they disclosed was sympathetic, some family members who knew their HIV status were unwilling to accept that PLWH tested positive. Some PLWH were not allowed to cook or share their food with any other person. While the relationship of some family members of PLWH remains unchanged, FGD participants mostly recounted unpleasant experiences such as insults, abandonment, and divorce.

'Honestly, when I came to know I was infected (HIV) I went through a lot, my marriage was broken, and I was disgraced' (33-year old female IDI participant)

The support that participants receive from partners, family, or friends varied from financial support, help with collecting medication and receiving food to receiving reminders for medication intake and advice and real emotional support, care, and encouragements. Support seemed mostly financial. Some participants described the support they received from partners and family members as empathic, loving, trusting, and caring.

'Ooh because he [husband] knows [I am HIV positive] he does not disturb me. He takes very good care of us and supports me with my medication intake' (30-year old IDI participant). However, quite a few also seemed to be just satisfied when family or partner is accepting them and when receiving money or food, while emotional care seemed to be completely lacking.

'[…] he [husband] was accepting and when I need to come for medication, he gives me money for transportation if he has it […] but my husband was not angry or anything because he tested negative, he believed that it was a spiritual illness. […] The only thing is that, recently, there was a funeral in my village and an aunt of mine got a girlfriend for him who stays in Kintampo. That has caused some problems for us. When we sleep, he does not even want my body to touch his.
M: Does it mean his support has dwindled?
R: Well, I will say no. He still provides food for us and takes care of the house' (30-year old female IDI participant)

Most PLWH stated that financial support (mostly used for transportation to hospital) was not constant as partner or family regularly stated not having money. Some participants stated not receiving any support at all.

Community responses

Participants in both FGD and IDI indicated that community members respond negatively towards PLWH even if it is a mere suspicion that they are HIV positive. The suspicion leads to gossiping or insults. However, when PLWH are looking healthy (because of ART) these responses tend to stop.

'…..I hoped that, when I took the medication, it was going to help me live long. Therefore, I do not joke about the medication. Some people are now confused, they are not sure whether I am indeed infected or not….' (35-year old female FGD participant).

PLWH with real stigma experiences indicated that people around them who know their HIV- positive status tend to avoid them. They described avoidance to include dissociation and exclusion, not touching PLWH or anything that belongs to them (food, drinks, etc).

Organisation of ART clinics

Despite the integration of the ART clinic with other chronic conditions like diabetes, the location of ART clinics within the hospital premises poses a chance of recognition and therefore for stigmatisation.

Even though most of the younger participants were afraid of being seen, a few older PLWH were not bothered about recognition, they said this is because people have different reasons for visiting the hospital.

'Even if it is a bother, we are all sick that is why we are at the hospital. You do not know what is wrong with me. For all you know your reason for coming to the hospital is bigger than mine' (51-year old female IDI participant)

Some PLWH opined that holding a clinic for only one day in a week as was practiced in some ART centres did not only increase the waiting hours, but it also coincides with market days which increases the likelihood for meeting familiar people. Sometimes they travel all the way to the clinic but do not receive a refill because the medication is out of stock.

The attitude of Healthcare providers (HCP)

In general, most PLWH were satisfied with the services they received at the ART clinics. They appreciated the service and counseling. They stated that the staff was friendly and respectful.

'Ooh, when we come they do not frown. They are very friendly and take good care of us [….]' (36-year old female IDI participant).

However, some participants said HCP rudely treated them because of their HIV status. They described stigmatizing experiences such as HCP frowning, unwillingness to help, taking extra precautionary measures especially with PLWH, rude, unfriendly, and impatient.

'Some nurses are unfriendly and intolerant. When they know you are infected the way they sometimes respond to you is not the best' (26-year old female FGD participants)

Treatment adherence counseling

The majority of the participants received counseling from two weeks up to several months by either an HCP (nurse, midwife, pharmacist, doctor) or a model of hope. It was however not always clear whether the participants received both the pre-test counseling as well as the post-counseling. The counseling that most participants remembered was centred on information on the efficacy of medication, adherence, medication side effects, transmission routes (including mother to child), and having a healthy diet/lifestyle (including safe sex and positive future perspective).

'Yes, initially I used to worry a lot… However, whenever we come for medication we are counselled that, if we consistently take our medication HIV will not kill us. We can live our lives to the fullest' (50-year old female FGD participant).

The information received also seemed to help in counseling family members. Few participants received the advice not to disclose, choose a PLWH as a partner in order not to further spread the virus, or to report stigmatisation. Treatment options that suited the lifestyles of the participants and self-regulation were rarely mentioned.

Transportation costs

The majority of the participants indicated that unlike previously when an NGO used to support them, the cost of transportation to the ART clinic was now a challenge for their regular visit to the clinic and they often lack (financial) support.

'We have challenges with the cost of transportation. That is why we are requesting that we be supported to be able to do some work so that we can cater for our medication' (40-year old female FGD participant).

Discussion

In this study, the individual and environmental factors that may influence adherence to ART among people living with HIV (PLWH) in Ghana were explored using individual interviews and focus group discussions. The findings suggest that self-regulation, outcome efficacy, medication side effects, knowledge on HIV, stigma, disclosure, coping, partner, family and community support, the attitude of healthcare providers, organization of the ART clinics, and transportation cost may influence ART adherence. Among these factors, the outcome efficacy of ART, anticipated stigma, the attitude of healthcare providers, and transportation costs to the ART clinic seem to have the strongest influence

A very interesting finding was that participants showed a strong intrinsic motivation to continue their ART medication because of visible improvements in their overall health. Despite reporting some side effects, mostly during antiretroviral initiation, the positive outcome of taking ART strongly supported intake. To our knowledge, this strong impact of visible treatment outcome on ART adherence has not yet been reported in the literature. However, evidence suggests that outcome expectations do indeed influence treatment adherence in patients with various other medical conditions (Laferton et al., 2017). We argue that the fast and visible improvement in our sample influenced their motivation to take their medication. This underscores the need to develop adherence-counseling models that reiterate PLWH expectation of an efficacious outcome by assessing and understanding these expectations to optimize treatment outcomes.

Another striking finding was the positive relationship between PLWH and the ART Healthcare Provider (HCP). Most PLWH described HCP as being friendly, supportive, respectful and helpful. They felt healthcare providers listened to them and did not report any experiences with insults. This finding is in contrast with the majority of the literature that reports strong stigmatizing responses from HCP to PLWH (Madeleine et al., 2011). Our study adds to the limited data on the positive attitude of HCP towards PLWH (Dapaah, 2016; Van Der Geest & Sarkodie, 1998). An explanation for the positive relationship that we found among HCP as compared to other studies may be that we focused specifically on HCP working in ART centres while most publications focus on HCP in a broader, general healthcare sector. The contact hypothesis may be an explanation that HCP in ART clinics are more empathetic towards PLWH as compared to HCP in the general healthcare setting (Chan, Brian T., 2017). The difference between HCP in ART centres verses those in the general healthcare sector and the role of contact would be worth exploring further as a stigma reduction strategy.

This notwithstanding, few participants' experienced negative attitudes from the healthcare providers. In an attempt to protect themselves from infection, HCP awkwardly interacts with PLWH or treat them differently as supported by (among others) Stutterheim and colleagues (Stutterheim et al., 2014). On the other hand, PLWH may have an expectation of stereotypic behaviors from HCP and interpretation of HCP behavior, which may not be necessarily entrenched in actual prejudice or undesirable attitudes towards PLWH. In their discussion of HIV-related avoidance attitudes among healthcare providers in China, Li and colleagues assert that HCP's negative attitudes toward PLWH may be due to fatigue, emotional distresses or work-related stress rather than stigma (Li et al., 2007). We are not suggesting that stigmatization is not happening in healthcare facilities, but we argue that the expectation of stereotypic behaviors may also influence PLWH clinic visits, hence their medication adherence.

Narratives from PLWH show that they used emotion-focused coping (eg. religious coping) and problem-focused coping (eg. selective disclosure) to deal with stigma and improve medication adherence. A very interesting finding was that PLWH in this study downplays their seropositive status by comparing it with hypertension and diabetes as a way of coping. For example, PLWH tells themselves that hypertension or diabetes is more dangerous than HIV, and missing a dose in the case of the former will lead to a medical emergency.

Literature suggests that people who find positive meaning to their illness can mentally adjust to the disease (Farber, Mirsalimi, Williams, & McDaniel, 2003; Makoae et al., 2008). Attaching a positive meaning to HIV may be beneficial on the psychological adjustment of PLWH. We would contend that the fact that participants mentally adjusted to their HIV status by comparing HIV to other chronic conditions shows the resilience of PLWH to live positively with HIV. This may be beneficial on the psychological well-being of PLWH and may elicit protective health behavior like adherence to medication

Interestingly, the accounts of most participants conveyed that only a few of them had experienced enacted stigma. The majority of the participants merely seem to anticipate stigma, which is one of the main reasons they fear to visit a nearby ART clinic and were prepared to travel long distances at extra cost for antiretroviral refills. This finding is corroborated by some studies that reported that anticipation of stigma influenced PLWH adherence to ART (Ahmed et al., 2018; Camacho, Kalichman, & Katner, 2020; Katz et al., 2013). Indeed, PLWH is aware of being discriminated against in their social interactions because of which PLWH anticipates stigma (Bos et al., 2013a). This anticipation influences adherence to medication in that PLWH may have to access and take the medication in secrecy with its consequent challenges. Multi-component interventions that support PLWH to deal with anticipated stigma and engage community agents who are sources of stigma will be useful for PLWH medication adherence.

Even though ART in Ghana is free of cost to PLWH, results indicate that transportation costs were a barrier for a clinic visit for an antiretroviral refill and hence adherence. Tuller and colleagues (Tuller et al., 2010) reported similar findings that even though patients had a high level of commitment to adhering to their medication, the high cost of transportation compromised adherence to ART and access to care. Supporting PLWH with jobs will enhance the affordability of services.

PLWH in our study showed that religion is an important form of coping. The importance of religion in HIV stems from the fact that PLWH receives comfort, care, and relief by praying, depending on God to heal or help them to cope with HIV. When PLWH believes that God grants knowledge to humans to provide medicines for their relief, it motivates them in adhering to antiretroviral. Religious organizations are important social networks that have the potential to support or stigmatize PLWH, encourage or hamper HIV education, make PLWH accept or refuse antiretroviral treatments. As such in Ghana and elsewhere, religious leaders are important stakeholders in HIV management support (Majumdar, 2004; Nyblade et al., 2003).

However, religion can also negatively influence PLWH by motivating them to stop medication intake and depend solely on their belief in a cure from HIV (Kretchy et al., 2013; Negash & Ehlers, 2013). Wanyama and colleagues in their discussions of ARV adherence in Uganda indicated that about one percent of patients discontinued medication because they believe in spiritual healing. This treatment interruption not only resulted in treatment failure but a transition to second-line more expensive options (Wanyama et al., 2007). Few participants perceived HIV was either a spiritual condition, airborne, foodborne, or a gift from God. Religious leaders who are engaged as stakeholders in HIV care and support would benefit from tailored training on how to contribute to PLWH treatment adherence and well-being. The superstitious beliefs and myths about HIV and antiretroviral will need to be addressed to improve adherence to medication

PLWH disclosed their HIV status only to people they trust to support them when they need help. The findings suggest that any form of support is useful in living with HIV and medication intake. However, PLWH who enjoys a partner's or close family-members support may receive emotional care, which is especially important for patient medication adherence and well-being (Cohen & Wills, 1985b). This is however lacking because most of our participants were not in stable relationships. The lack of support may be influenced by cognitive representations among the patients' relatives such as perceived responsibility, perceived severity, perceived dangerousness, and perceived norm-violating behavior (Bos et al., 2013; Dijker & Koomen, 2003). Family interventions to reduce these representations may help in increasing emotional care.

The current study has some limitations. Mostly adherent PLWH may have been included in our sample; we envisage that their responses could be different from PLWH who do not often come for refills. In addition, the majority of our participants were females; this however is reflected in the total number of persons in HIV care in Ghana (Ghana AIDS Commission, 2020). This could in part be due to the prevention from mother to child transmission (PMCT) program and in part due to non-disclosure by females to male partners. Our study recognises that policies and punitive laws may be a barrier to ART clinic visits and medication adherence (Laar & Debruin, 2017). This is however beyond the scope of this study. Future research should explore how policy influences PLWH antiretroviral adherence.

This study looked at both individual and environmental factors using qualitative interviews. This allowed for in-depth knowledge on the context-specific factors that influencing ART adherence.

In conclusion, although PLWH appreciates the need to adhere to antiretroviral, they face practical challenges. This study identified factors influencing ART adherence that could be used to develop interventions. We suggest the intervention-mapping approach (Bartholomew et al., 1998) to be used to develop, implement and evaluate interventions. These interventions may target PLWH, partners, families, and healthcare providers as change agents within the community to improve PLWH adherence behavior.

CHAPTER

3

A qualitative analysis of factors influencing Healthcare providers' behavior toward persons living with HIV

Manuscript published as:
Abdulai, M.A., Mevissen, F.E.F., Kramer, A., Boitelet, Z., Asante, K.P., Owusu-Agyei, S., Ruiter, R.A.C and Bos, A.E., (2023). A qualitative analysis of factors influencing healthcare providers' behavior toward persons living with HIV in Ghana. *International Journal of Africa Nursing Sciences,* 100532. (2023).
https://doi.org/10.1016/j.ijans.2023.100532

Abstract

Background: A healthcare provider (HCP) who has a positive relationship with a patient is likely to build trust and improve care for People Living with HIV (PLWH). The study explored the individual and external factors influencing HCP behavior towards PLWH and compares HCP in antiretroviral therapy clinics (AHCP) with HCP in general healthcare settings (GHCP).

Methods: This qualitative study used a semi-structured interview protocol to guide individual in-depth interviews among 33 HCPs (nurses, physicians, and biochemist). The interview protocol was informed by the empirical literature and included topics such as perceptions and experiences working with PLWH, HIV-related risk perception, HIV-related training received, knowledge about HIV, emotions towards PLWH, institutional, supervisors and collegial support related to patient care. The interview data were thematically analyzed.

Results: Both AHCP and GHCP claimed that their thoughts and judgments never influenced the way they managed PLWH, but in-between the lines there appears to be reflections of either sympathy or positive discrimination, especially for AHCP, or stigmatizing behaviors such as using gloves for PLWH-only among GHCP. The findings from this study suggest that individual factors such as perceptions of HIV, attitude towards HIV patients, different emotions (fear, pity, anger, and empathy), and HIV-related training received and external factors such as availability of guidelines and logistics, infrastructural and reimbursement challenges influenced AHCP and GHCP behavior towards PLWH.

Conclusion: The findings from this study suggest that individual and external factors influence AHCP and GHCP behavior towards PLWH. We recommend the use of Intervention Mapping to develop, implement and evaluate interventions that address the behavior and emotions of both AHCPs and GHCPs to reduce stigmatization of PLWH in the healthcare sector, hence improving hospital visits and medication adherence.

1. Introduction

Globally, 37.6 million people were living with HIV in 2020 with about 27.4 million accessing antiretroviral treatment (UNAIDS, 2020). Persons Living with HIV (PLWH) need to adhere to antiretroviral medications to achieve maximum viral suppression (Haas et al., 2016). A systematic review and meta-analysis of antiretroviral adherence in sub-Saharan Africa reports an adherence score of 72.9% (Mills et al., 2006). Adherence levels of 60% to 80% have been reported in Ghana (Obirikorang, Selleh, Abledu, & Fofie, 2013; Ohene & Forson, 2009), which is below the optimal adherence of 95% to 100% (Mills et al., 2006).

Evidence suggests that the patient- healthcare provider relationship is key to treatment adherence (Campbell et al., 2015; Pharmacy et al., 2021; Roberts, 2002). A healthcare provider (HCP) is expected to undertake activities that contribute to health promotion or prevent illness, among which assessment and diagnosis of illnesses, provision of treatments, managing health conditions and the healthcare system, and building therapeutic alliances (Patey et al., 2022). For example, in building therapeutic alliances HCP supports patients to manage their conditions both cognitively and emotionally through collaboration, communication, empathy, and respect (Dapaah, 2016; Leventhal et al., 1992, Patey et al., 2022). A patient builds a more trusting relationship with a healthcare provider if the quality of their relationship is high. A positive relationship that is built on trust, a common understanding of health-related goals and continuous patient access to care is important for medication adherence (Pharmacy et al., 2021; Roberts, 2002).

When a Healthcare Provider (HCP) develops a trustworthy relationship with Persons Living with HIV (PLWH), the PLWH trusts for the medications received from the HCP increases (Birkhäuer et al., 2017) and they are more open to discussing the challenges of antiretroviral therapy (ART) that may otherwise cause them to stop the medication (Archiopoli et al., 2016). A trustworthy HCP-PLWH relationship improves participatory decision-making of PLWH (Archiopoli et al., 2016; Hawk et al., 2017; Stutterheim, 2014). The literature shows, however, that many PLWH report negative experiences in their interaction with HCP (Atinga, Abekah-Nkrumah, & Domfeh, 2011; Stutterheim, Sicking, Brands, Baas, Roberts, Van Brakel, et al., 2014). These negative experiences include awkward social interaction, rudeness, differential treatment because of the HIV-positive status, excessive carefulness and double gloving (Abdulai et al., 2022); Stutterheim et al., 2014). These uneasy HCP-PLWH relationships may foster, among others, secrecy about non-adherence to avoid being judged or threatened by an HCP (Campbell et al., 2015; Pharmacy et al., 2021; Roberts, 2002). Some empirical studies among healthcare providers in sub-Saharan Africa and Asia report that between 77% and 84.3% of healthcare providers expressed negative attitudes towards PLWH (Hassan & Wahsheh, 2011; Li et al., 2007b; Adetoyeje, Oyeyemi, & Bello, 2008). Nonetheless, some studies also report positive experience between PLWH and HCP (Abdulai et al., 2022; Dapaah, 2016; Stutterheim, 2014). Knowing the factors that are associated with either a positive or a negative interaction may help in building interventions that stimulate and improve positive relationship between PLWH and HCP, which in turn motivates adherence, health and well-being of the PLWH.

Several individual and external factors may drive the behavior of HCP towards PLWH and vice-versa (Abdulai et al., 2022; Ishimaru et al., 2017; Manganye, Maluleke, & Lebese, 2013; Sadob, Fawole, Sadoh, Oladimeji, & Sotiloye, 2006; Vorasane et al., 2017). Some individual factors that may influence HCP behavior towards PLWH include limited knowledge of and misconceptions about HIV, fear of contagion (Adetoyeje et al., 2008; Boakye & Mavhandu-Mudzusi, 2019), self-efficacy towards PLWH, and stigma (Ishimaru et al., 2017; Manganye et al., 2013; Stutterheim, 2014). Limited knowledge and misconceptions influence HCP's confidence in providing quality services to PLWH. This may inform HCP's unwillingness to care for PLWH or stigmatize PLWH.

Stigma in the healthcare setting is detrimental and contributes to poor health outcomes of patients (Nyblade et al., 2009). A systematic review and meta-synthesis of the impact of HIV-related stigma on treatment adherence shows that 71% of cross-sectional studies and 86% of longitudinal studies report a positive association between HIV-related stigma and treatment non-adherence (Kalichman et al., 2019a; Rueda et al., 2016).

Moreover, certain cognitive representations associated with PLWH/HIV may influence HCP behavior towards PLWH. The cognitive-emotional model (Bos, Schaalma, & Pryor, 2008); Bos, Pryor, Reeder, & Stutterheim, 2013) clarifies that HCP's cognitive representations, such as perceived contagiousness of HIV, perceived seriousness of HIV, personal responsibility for HIV and perceived norm-violating behavior, may influence the emotions of fear, anger and/or pity towards PLWH, which could affect their behavior towards and treatment of the patient. HCPs who perceive HIV as dangerous may out of fear and manifest avoidance (Bos et al., 2013a; Stutterheim, Sicking, Brands, Baas, Roberts, Van Brakel, et al., 2014). A healthcare provider who perceives PLWH to be responsible for their infection may be angered, which may result in treating the patient more aggressively. The perceived severity of HIV may elicit both pity and anger, a state of emotional ambivalence, which may lead to awkward interaction. HIV is associated with different norm-violating behaviors such as homosexuality, IV-drug use and promiscuity. People who have negative attitudes towards these behaviors may show anger towards PLWH and/or develop stigma against them (Dijker & Koomen, 2003; Bos et al., 2008a; Bos et al., 2013a).

Apart from the individual factors, external factors may also influence HCP behavior towards PLWH. These include inadequate support from colleagues or supervisors, inadequate infrastructure and logistics, and unclear guidelines on patient care, treatment and support (Feyissa et al., 2012; Nyblade et al., 2009). For example, when HCP works in settings that do not provide the right ambience for optimal care, it may lead to poor patient management. Again, if the institution or supervisor does not promptly work on medication stock-outs, it will influence PLWH adherence to medication. A good understanding of the guidelines for treatment and the availability of adequate infrastructure may help the HCP to provide satisfactory and confidential services that ensure privacy to the PLWH.

The contact hypothesis suggests that prejudice and conflict among a group can be reduced if members interact (Pettigrew & Tropp, 2008). Contact approaches that expose HCP to PLWH may help develop empathy, humanize PLWH and break down stereotyping (Nyblade et al., 2019). Furthermore, an HCP who has not attended an HIV-related training either may be unaware of HIV-related policies or may not have the self-efficacy and skills to counsel PLWH to adhere to medication (Cheema et al., 2019). In Ghana, HCP providing direct HIV-related healthcare services receive extra training on counseling, testing and treatment (Ghana AIDS Commission 2013; Boakye & Mavhandu-Mudzusi, 2019). This training equips HCP with the requisite skills to relate to and treat clients professionally, understand and handle the risks associated with caring for PLWH. As such, HCP in the ART clinics who are knowledgeable about HIV and are in frequent contact with PLWH may have fewer stigmatizing behaviors and attitudes. However, HCPs who have inadequate knowledge about HIV, or who have less contact with PLWH, may stigmatize or discriminate against PLWH (Pettigrew & Tropp, 2008). This may partly explain the contradictory findings in literature regarding positive versus negative experiences of PLWH with HCP. Healthcare providers who work intensively with PLWH in the ART clinics will have less stigmatizing behaviors towards PLWH because presumably they have satisfactory knowledge, training through seminars/workshops (Boakye & Mavhandu-Mudzusi, 2019) and contact compared to those in the other departments.

The present study explores the individual and external factors influencing HCP behavior towards PLWH and compares HCPs in ART clinics (AHCP) with those in the other departments (GHCP). We did not only consider individual-level factors to explain differences and similarities in behavior, but also looked at external factors in the organizational environment, to understand the full perspectives of factors influencing HCPs behaviors towards PLWH.

2.0 Material and Methods

The study methods are guided by the consolidated criteria for reporting qualitative research framework (COREQ)

2.1 Study Design

This study employed an exploratory qualitative approach using a semi-structured interview protocol to guide in-depth individual interviews. This qualitative design is deemed appropriate for generating detailed understanding of HCP's experiences, thoughts, and emotions and allows for an interpretation of their actions especially in a context where data is limited. Furthermore, it allows the researcher to react to social cues such as voice, intonation, and body language, which is especially important in this research since it addresses a socially sensible topic (Opdenakker, 2006; Showkat & Parveen, 2017).

2.2 Study setting

The study was conducted in the Bono East Region of Ghana. The region is composed of 11 districts and over 40 health facilities that provide healthcare services to its residents. Three hospitals that attend to a PLWH-registered population of over 4000 were purposively selected. The strategic locations of the hospitals within the region, the set-up similarities with other hospitals in Ghana and the size and set-up of their ART clinics (stand-alone versus integrated) were considered in the selection of these facilities. To ensure confidentiality, the three hospitals have been anonymized as facilities A, B and C, (details are available with first author upon request).

2.3 Participant recruitment

A heterogeneous group of HCPs (18 years and above) were purposively selected from either ART clinics or the general healthcare setting that mimic the points of entry of patients from the outpatient departments (OPD), male and female wards, surgical theatres, and labour wards. The heterogeneity of the participants was based on their age, sex and cadre of HCP in either ART clinics (AHCP) or general healthcare settings (GHCP). Prior to interviewing, the lead author held meetings with the hospital administrations to discuss the study protocol and presented a copy of the protocol and a written request for the conduct of the study to the administrator. The administrator subsequently approved the request and sent copies of the approval to the ART clinics and the various departments to inform them of our study. Following this, we met with the in-charges of the ART clinics and the various departments to explain the aim of the study to them. We explained that because of the important role of HCPs in providing care to PLWH, we were interested in seeking their opinions and experiences with service provision for PLWH in ART clinics and the other departments, as well as their ideas on how PLWH deal with HIV and antiretroviral intake. The clinic and departmental in-charges informed their staff whom we subsequently approached to take part in our study, which they readily accepted.

We visited the ART clinics or the other departments once or twice in a week to recruit staff who was available as scheduled. As part of the recruitment, we informed participants about the purpose of the study as described above and their right to leave the study without giving a reason and with no professional or personal consequences. We further emphasized that we would protect their confidentiality by anonymizing their responses and assigning unique identification numbers to them, and there is minimal risk for taking part in this study. The participants were invited to share their views, opinions and experiences working with PLWH. HCPs in other departments were told in addition that even though they do not work closely with the patients, they could provide important insights and experiences to the study. Individuals from the various departments who agreed to take part in the interview either did so immediately or scheduled a convenient time for the interview. In total, we approached 40 HCPs of which seven participants declined participation because of their work schedule at the time of the visits. See Table 1 for an overview of the category of the healthcare providers interviewed.

Table 1. *A table showing the number and different healthcare providers in various disciplines interviewed*

Profession	Facility A	Facility B	Facility C	Total
Physician Assistants/Medical Officer	3	4	1	8
Nurses	7	6	6	19
Laboratory technicians/Biochemist	0	1	1	2
Counsellor	0	0	1	1
Pharmacists	1	1	1	3
Total	11	12	10	33

Some of the other professions doubled as counsellors and 0 if they were more in managerial role than direct patient contact

2.4 Research instrument

The interview protocol was semi-structured and guided by a review of the empirical literature and theories that could explain the factors influencing HCP behavior towards PLWH and the HCP-patient relationship. The interview protocol was structured according to themes such as the participant's personal data, demographics and responsibilities as a healthcare provider. Further, in-depth questions were asked regarding the major themes (see interview protocol). Example we asked individual-level questions on knowledge about HIV, self-efficacy, behavior and attitude towards PLWH, emotions towards PLWH, risk perception of HIV, personal thoughts, perceptions and experiences working with PLWH. Additionally, we explored external factors on topics such as availability of logistics, work protocols, policies, HIV-related training received and support from institution or supervisors. Where necessary, probes were used to elicit indepth information. All these factors except knowledge about HIV transmission were explored among healthcare providers in both ART clinics and the other departments. This is because; HCP in ART by virtue of working in ART clinic would necessarily be taken through some training on HIV to boost their knowledge (Ghana AIDS Commission 2013). The protocol was pretested between two HCPs (1 AHCP and 1 GHCP). The pretest resulted in minor changes such as rewording of certain questions for clarity.

2.5 Data Collection Procedures

Data were collected from March 2018 to May 2018 for ART healthcare providers. This was followed by further interviews with HCP in other departments in the hospital from April 2019 to May 2019. The first, third and fourth authors conducted the interviews for triangulation to increase the credibility and reliability of the results. The first author is a female PhD student and an experienced qualitative researcher. The interviews were largely conducted by the third and fourth authors who were graduate students from Maastricht University. The researchers gave general information about the study and consented each participant (see participant recruitment) before starting an interview. HCPs were invited to read and sign an informed consent form before starting the in-depth interviews. The duration of each interview was between 30 minutes and 60 minutes. Saturation was reached with the 31st interview. Two more interviews were conducted after which recruitment ended because no new and distinct themes emerged. All the interviews were audio-recorded and held in English except one because of the participant's preference for Twi (a local dialect). The recordings were transcribed verbatim and translated into English (the one in Twi). The interviews were conducted in consulting rooms within the hospitals.

2.6 Data management and analysis

Thematic data analysis was used to analyse qualitative data. The data analysis processes followed the thematic approach proposed by Castleberry and Nolen, 2018. The first author transcribed the audio recordings verbatim. The transcripts were re-read for familiarity, accuracy and completeness. The data was imported into Atlas Ti software version 8 and analysed by the first, second, and last authors. Six transcripts were systematically coded by the second and last authors (three each), after which, the codes were organised into possible themes. The authors in a series of meetings discussed these themes until agreement was reached on the final themes. The first author generated reports for each thematic category. The second author where necessary reviewed the reports for refining, combining or recoding where needed. We added other emerging themes that were peculiar to some transcripts. All categorised themes were summarised.

2.7 Rigor

We pretested the interview guide among two AHCPs and GHCPs each to determine if respondents understand the questions and elicit responses that answer the research question. A good description of the study setting and procedures was done to ensure the transferability of study findings. We also kept field notes and audio records to guarantee confirmability. To ensure dependability, we provided a thorough description of the research methodology including the participant recruitment process, data collection procedure and data analysis methods**.**

2.8 Ethics statement

Ethical approvals for this study were obtained from the Institutional Ethics Committee (IEC) of the Kintampo Health Research Centre (FWA00011103) and the Ethical Review Committee Psychology and Neuroscience at Maastricht University (ECP_04_09_2012_S22) in 2017.

3. Results

First, we report on the participants' characteristics, the three main themes namely healthcare provider's behavior towards PLWH, individual and external factors influencing HCP behavior towards PLWH. This will be followed by nine sub-themes including knowledge about HIV transmission, perceived responsibility, attitude of HCP towards PLWH, emotions, self-efficacy and skills towards PLWH care, training on HIV and PLWH care, availability of guidelines for patient care, logistics and resource availability, and supervision support

We also report on the combined results of healthcare providers in antiretroviral clinic (AHCP) and those in the other departments HCP (GHCP). All-important differences emerging between these two groups are highlighted.

3.1 Participants Characteristics

Thirty-three respondents (made up of 17 males and 16 females took part in the study. Thirteen, twelve and eight HCPs were recruited from hospitals A, B and C respectively. Of the thirty-three participants, twenty worked in ART clinics and thirteen in the other departments. The participants' ages ranged between 26 years and 57 years (*M* = 37.1, *SD* =8.1, median =35). Most of the participants were Christians (94% Christian) and 6% Muslim. Majority of participants were married (67%). The number of years HCPs from the other departments had worked ranged from 2 months up to 35 years. Those in ART clinics had been working at the ART clinic for 2 months up to 10 years. The majority (75%) of the participants had received some training on HIV transmission. At the time of the study, hospital A had finished training most staff on anti-stigmatization of patients.

3.2 Healthcare providers' behavior towards PLWH

Both AHCP and GHCP said that their thoughts or judgments never influenced the way they manage PLWH. In-between the lines, however, there seemed to be reflections of either sympathy/positive discrimination especially for AHCP (e.g. treating them a bit too special) or negative discrimination (being extremely careful).

One AHCP stated; "*We always should be careful but you cannot avoid responding differently" (32-year old male physician assistant)*

"….when we detect that you have HIV, then your case becomes a bit special for us, because of the stigmatization and other things. We do not want the general rules to apply to you, so in your case you are isolated. We select you from the group, and then we treat you specially" (37-year old male pharmacist)

During the interviews, AHCPs were more inclined to reporting negative behaviors of their colleagues such as free charting (guessing health vitals without actively assessing patient):

"Some of the nurses' resort to free charting because they would not want to get close. They would not get close to the patient" (32-year old male nurse)

Some GHCP, in their responses confirmed this assertion to be true. Some of them revealed that they sometimes get angry with patients, provide inadequate care, completely avoid providing care or deliberately delay the care they need: Nevertheless, they stressed that they exhibited some negative behaviors in the past only (before receiving HIV training); this included refusing to set IV lines for PLWH, "unnecessary and double gloving", and avoiding PLWH.

"Sometimes when you are on duty with other colleagues, you intentionally avoid the PLWH and ask others colleagues to go and attend to him or her" (34-year old male nurse)

A few GHCPs said that they could be laxed about some safety protocols when dealing with non-PLWH but they will always remember to apply these protocols for a PLWH.

"When you are going to give the IV injection to a pregnant woman who has delivered through Caesarean section, sometimes you will go without wearing gloves. Nevertheless, "when it comes to them [PLWH] we have to wear it. Sometimes, there is a bit of discrimination when you wear it….." (35-year old female midwife)

"We wash hands after attending to all patients but once you know this person is positive, you are tempted to wash your hands immediately after attending to him or her than any other patient" (33-year old female midwife)

In order to be able to identify a PLWH, some GHCP said they label PLWH patient folders by writing a code that is "supposedly" decoded by HCP only.

When the mother is HIV positive we have a column where we write a certain number, for those who are HIV positive, they write 279. So [when I see this number] I get two know this woman is reactive (HIV positive)" (34-year old male nurse)

3.3 Individual factors influencing healthcare provider's behavior

3.3.1 Knowledge about HIV transmission

Generally, GHCP had basic knowledge about HIV transmission. They stated that unprotected sexual intercourse, commercial sex works, blood transfusion, use of unsterile sharps were the main routes of infection albeit not the only route.

These notwithstanding some misconceptions about the routes of transmission were noted, with one GHCP who said HIV could be transmitted through sharing toothbrush and kissing.

"…. It can be contracted through sexual intercourse, deep kissing, sharing of toothbrush" (32-year old male nurse)

AHCP observed that PLWH, mainly the youth, are lured into sexual activities sometimes due to poverty. AHCP conveyed that over the years, awareness creation on HIV in Ghana has reduced across the media space, which has perpetuated stigma around HIV.

"….in Ghana, at first, the [HIV] awareness creation was so high. Everywhere you go there was this awareness on television, radio stations, mobile vans announcing to people that there is this condition [HIV] 'please protect yourself, do that and that and that'. Nowadays, that awareness creation has come down. It is no more. They are not doing it the way they used to educate people on AIDS and preach against stigmatization. All of those things have come to a halt. Almost every week we are now getting a new case of HIV being diagnosed" (37-year old male laboratory technician)

3.3.2 Perceived responsibility

Some AHCP, similar to GHCP, said PLWH were responsible for their infections due to their risky behavior and lifestyle. GHCP expressed that in a few cases it may be due to occupational hazard:

"Yes, some [people are responsible for their infection], because of their lifestyle. However, for others it is not their fault if they get it [HIV]. Some contract it accidentally…. some of the health workers are infected not because of their behavior, but through occupational hazard" (35-years female midwife)

One AHCP added that some PLWH purposely infect others

"Hmm with HIV, I think those infected need more education, because they already know, they have the condition, but yet moving with other people just to infect them" (33-year old female nurse).

3.3.3 Attitude of healthcare providers towards PLWH

Both AHCP and GHCP had different attitudes towards PLWH. Most AHCP described their HIV-patients as "normal patients" and "human beings just like all other patients". According to them, the patient always comes first regardless of the condition. AHCP and GHCP indicated that they derive satisfaction from caring for PLWH as they frequently visit their clinic leading to rapid recovery and PLWH are thankful for their services compared to other patients.

Several times, most of them get very healthy and live normal lives. They may not have anything to give as an appreciation but approaching you alone to tell you they are well and healthy makes me happy **(**" (41-year old female health assistant)

GHCP, however, described PLWH as illiterates, adding that patient's gossip, insult and consciously try to infect them, or misinterpret their behavior (e.g. not understanding that gloves are used for all patients and not only for PLWH). This notwithstanding, both GHCP and AHCP seemed to differentiate between PLWH based on their level of cooperativeness. A more negative evaluation was made of PLWH they followed if for example AHCP or GHCP perceive PLWH as being in denial/not accepting their status and/or believing it is spiritual, non-cooperative or non-adhering:

"….. When somebody is living with HIV refuses to take his or her drug that is when I am so worried… My worry is that innocent people will be infected" (43-year old male nurse)

3.3.4 Emotions

Most AHCP and GHCP expressed fear of being infected with HIV whilst carrying through their routine work. AHCP and GHCP converged on expressing the need to be extra careful when working with PLWH, especially when it comes to needle use.

"No, it is not different the same care yes, it is just that you have to be extra careful with them so that you are not pricked" (27-year old female nurse)

Both AHCP and GHCP respond to this fear by being careful and pray they are not infected. GHCP, regardless of receiving training on HIV, seemed to be extremely careful for fear of infection and strictly follow safety precautions especially when HCP knows the patient is HIV positive.

A few GHCPs said they are never worried about infection but they will not ignore any safety precautions

"I do not [worry]....…..If I am to render services, I take safety measures, when we want to take vitals and the fellow has infected skin, I do not put the cuff on the person's arm. If the person has lesions, I have to use gloves before I touch them to protect myself. (41-year old female nurse).

Some GHCP mentioned that they were extremely careful and hesitant in caring for PLWH until they participated in a specific HIV-related workshop. Nevertheless, one can read one's fears in between the lines. There seemed to be a slight tendency for GHCP, who did not recently follow an HIV/stigma workshop to be even more anxious about contagion, resulting in subtle expressions of different handling of patients:

"That is once you know the person is HIV positive, you tend to be much cautious. You tend to be much careful when working with them than working on other patients who are not positive so I think that is the only thing. You tend to be more cautious so that you do not also infect yourself or expose yourself" (33-year old female nurse)

Some GHCP also expressed emotions such as sympathy, pity or sadness towards PLWH

"Oh, I feel sad especially when I see them in their sick state" (39-year old male nurse)

"It feels they have a borrowed time to live: "Seeing the infected people, I sometimes pity them. It is as if you know that they are dying, that they have a few years or they are on borrowed time." (28-year old female nurse)

"Personally it is sad when I meet somebody or find out someone has the disease so I sympathize with the person, It may not be the person's fault and even if it is the fault of the person**"** (51-year old female midwife)

More AHCP than GHCP expressed empathetic feelings towards PLWH and were not worried about taking care of PLWH:

"It could have been me, so if 'I do not feel like taking care of HIV, that would be very bad. Being HIV infected might not be intentional but due to chance so I do not have any problem taking care of HIV" (37-year old male physician assistant)

Irrespective of the training received, some GHCP struggled to care for PLWH prior to their training on PLWH care

"Ooh now I have positive relationship working with them (PLWH), previously, I was having problems with them (PLWH), but now I feel okay when I am working on them" (30-year old female nurse)

"I used to struggle with getting closer to PLWH. As such when I am doing something for the person and the person does something small I become annoyed and talk harshly to them. This makes them uncomfortable" (34-year old male nurse)

3.3.5 Self-efficacy and skills towards PLWH care

Most AHCP and some GHCP expressed confidence in working with PLWH.

"Very, very, very confident because I know the training that I passed through, when you are attending to the patient, you feel you know what you are doing. So, you would not think of "can I do what I am going to do?' When you are doing it, you have that kind of zeal to do it and you are not afraid" (26-year old female nurse)

However, one GHCP said he used to be less confident working with PLWH because he did not have enough knowledge on PLWH and HIV:

"Yes, before the workshop I was worried even when I come on duty alone. This is because you do not want to work on PLWH. I did not have enough knowledge on PLWH and HIV" (34-year old male Nurse)

3.4 External factors influencing healthcare providers' behavior

3.4.1 Training on HIV and PLWH care

All AHCP and majority of GHCP had received work-related training on HIV stigmatization. AHCP additionally received training on PLWH therapy, HIV, HIV counseling, HIV comorbidities, policy reforms and work protocols. However, most AHCP and GHCP expressed the need for more frequent updates that helps them to upgrade their knowledge with the current HIV-related issues and for continuous professional licensure. They conveyed that training and workshops are organized quarterly when it is necessary for new staff to be acquainted with the new knowledge:

"If possible every quarter of the year. So that newly posted staff will benefit from it. In the event that the current crop of HCP who received the training on stigmatization are unavailable to educate the new staff then it becomes a challenge but if these workshops are organized quarterly then would capture all the new staff for effective patient care" **(***36-year old female midwife).*

3.4.2 Availability of guidelines for patient care

All AHCPs stated that there were guidelines for HIV treatment even though they did not have them available in hardcopies whilst working at the ART clinic. Most of those who had it had soft copies, which were accessible online. Some participants indicated that they either adapted the policy to their facility, used their discretion or used the producers' manual (mainly in the laboratory) when implementing the guidelines in their daily practise. Most HCP seem to be well up-to-date with the latest guidelines or policy:

"Formerly, we gave prophylaxis before antiretroviral treatment. However, currently, once a person tests positive we start treatment" (57-year old male pharmacist)

Unlike the AHCPs, the majority of the GHCP did not know about protocols or policies specifically guiding the care of PLWH. They were more inclined to mention general nursing protocols. Some assumed that even if protocols were available, they would be in the ART clinics where they refer PLWH for therapy. Some GHCP said they used their expertise of general patient care for treating PLWH.

"We use our professional experience, you look at the needs of that particular patient then you provide. If the person is so weak that they cannot take care of their personal hygiene, we do it for the person: bath, feed, take care of their nails. You know as soon as we inform them that they are HIV positive, they tend to be psychologically down so it is the nurse's duty to reassure the patient. We use our general knowledge when we do not have the protocol" (33-year old female nurse).

A few AHCPs, referred to the old policy of using CD4 count to start patient antiretroviral treatment.

"…at times it depends on the CD4 counts some of the drugs are given according to the CD4 counts of PLWH…. (34-year old female nurse)

3.4.3 Logistics and resource availability

Both AHCPs and GHCPs stated that inadequate staff and infrastructural needs influence their work. Most AHCPs and GHCPs indicated that, though they have the basic resources, there are periodic shortages of essential logistics such as hand gloves. They however cope with the meagre resources available to them:

"We are managing with the little resources that we have. So many things that we do here, we improvise for it. Many times, we have shortage of even medication for our clients. All of that demotivates us" (37-year old female Nurse)

One HCP stated that sometimes they receive all the training but the logistics to do the work according to how they are trained is unavailable:

"Ahh, training is helpful but not that helpful when the resources are not there. Sometimes you have the training, but you need the logistics. So you have the training, you have the knowledge, and the things needed to do the work are not here (37-year old male Nurse)

They added that delayed reimbursement of treatment cost for PLWH from the National Health insurance Authority to the health facilities directly affect supply and maintenance of logistics and ultimately quality of patient care.

"Most of our clients are health insurance subscribers. Therefore, if the scheme is able to reimburse the funds frequently or timely and I think the managers will be able to procure the necessary logistics for us to use…" (34-year old male Nurse)

3.4.4 Supervisors Support
Generally, AHCPs and GHCPs described leadership of the health system as highly hierarchical. They asserted that the support they receive to provide care to patients is mostly limited. For the few who receive some support, they complained it was mostly encouraging words from their supervisors without any financial benefits. For some it is provision of training and workshops to enhance staff knowledge, supply logistics and provision of accommodation closer to the hospital.

"I can say because I stay in the hospital quarters, sometimes when they call at night…... so it makes the work easier than somebody staying far away from the hospital. This can maybe even cause the death of a patient, since they may take a while to get to the hospital" (33-year old male nurse)

4. Discussion

The patient- healthcare provider (HCP) relationship and the HCP's behavior towards patients is key to treatment adherence, also for people living with HIV (PLWH). This paper explored individual and external factors that may influence the behavior of healthcare providers towards PLWH. It further explored whether the behavior and factors differ between HCP working in ART clinics versus HCP working in the other departments. Although both AHCP and GHCP said that their thoughts or judgments never influenced the way they treat PLWH, there seem to be subtle expressions of stigma and differences in how they treat PLWH as compared to other patients. However, their stigma seems to go in different directions: The responses of GHCP suggested that they tend to express more negative, stigmatizing behaviors (e.g. consistent gloving with PLWH but not with other patients), while the AHCP tend to exhibit positive stigmatizing behaviors (e.g. treating PLWH sometimes a bit too special) towards PLWH. One would expect that AHCP, who had had more contact with PLWH, would have less negative perceptions of PLWH, reduce their anxiety and fears when interacting with them yet they still harboured subtle stigmatizing behaviors towards PLWH. Some explanations for this behavior include the fact that, contrary to the nursing qualities of care, nurturing, comfort, and concern and motivation to help people, both AHCP and GHCP may hold some stereotypic ideas about

HIV that may be enshrined in socio-cultural values that may influence their behavior towards PLWH (Adetoyeje et al., 2008). Another possible explanation is the subtle actions of well-meaning healthcare providers who may be unaware of the potential damaging effect of their actions on PLWH (Fominaya et al., 2016), such actions have been associated with self-pity, shame, hopelessness, decreased empowerment, self-esteem and psychological distress of PLWH (Stutterheim, 2011); (Fominaya et al., 2016). Indeed, self-pity may cause PLWH to overestimate the magnitude of HIV positive status and underestimate their ability to cope with its attendant feelings of hopelessness and helplessness (Fominaya et al., 2016) and may influence clinic visits, hence adherence to medication.

The perception of both AHCP and GHCP onset controllability of HIV is relevant for HCP behavior towards PLWH. This perception could be fueled by the long-held belief that HIV is due to norm-violating behavior such as commercial sex work, homosexuality, and promiscuity. The association of HIV with norm-violation portrays it as the disease of immorality as has been reported by other studies (Campbell et al., 2015; Dapaah, 2016a). HCP's appraisal of onset controllability could potentially evoke irritation or even anger (Bos et al., 2008a). These negative perceptions may lead to negative interactions between HCP and PLWH; hence affect clinic visits, medication adherence and well-being of PLWH.

The accounts of both AHCP and GHCP revealed that they were careful when working with known PLWH. GHCP, however, emphasized the need to be extremely careful. A plausible explanation for this behavior may be due to their limited knowledge on HIV, the need to protect themselves and their patients from other infections or the fear of the infection due to perceived severity and chronic nature of HIV with its attendant stigma. Some studies corroborates that out of fear healthcare providers exhibit stigmatizing behavior such as anger towards patients, provide inadequate care, completely avoid providing care or deliberately delay the provision of care to PLWH (Dapaah, 2016a; Dong et al., 2018)

Narratives from both AHCP and GHCP show that HCP express the need for more periodic training. Not only does this offer HCP the opportunity to be abreast with current knowledge in the field, frequent training may help with respectful patient management. As such, periodic training will help new staff posted to various department to benefit from HIV-related knowledge for patient care. The fact that some participants refer to the old HIV policy further emphasizes the need for frequent refresher training for both AHCP and GHCP. Though the special training AHCP received was expected to lead to more willingness to care for HIV positive persons with less negative attitudes and behaviors towards them, this was not so obvious in their self-reported behavior towards PLWH in this study. In contrast, previous studies reported that HIV training and the refresher courses equipped health workers to behave well towards clients during service provision and contribute to positive interactions between HCP and PLWH (Dapaah, 2016a; USAID, 2007).

The present study suggests that the shortage of some logistics and resources, such as gloves for protection, may affect the behavior of both AHCP and GHCP towards PLWH. This finding is similar to Sadob and colleagues (2006) who reported that healthcare providers were willing to provide services such as setting up an infusion if they wore gloves. Feyissa et al. noted that the perception of supply-related institutional support significantly reduced stigma scores and the shortage of materials and supplies was a cause of conflict between PLWH and HCP. This is because the lack of logistics tend to support discriminatory practices (Feyissa et al., 2012). In order for HCP to provide the needed care to PLWH, it is important for hospital management to provide the needed logistics for HCP to feel adequately protected in providing care to PLWH. Indeed as Cohen and colleagues noted, this may involve the provision of vital equipment, provision of furniture that is more basic and supplies, improving infection control and occupational health practices (Cohen et al., 2009).

Delays in reimbursement of medical cost as noted by AHCP and GHCP challenges the delivery of services to PLWH. AHCP and GHCP responses elaborates the non-payment of insurance claims by the National Health insurance Authority challenged the acquisition of equipment's and medical supplies for patient care. Similar to our findings, Akweongo and colleagues reported that non-reimbursement of insurance claims affects the financial capacity of health-facilities to provide medical supplies (Akweongo et al., 2021). In response to some of these shortages, some HCP may resort to the re-use of medical supplies with its attendant increased risk of infection. We contend that, non-reimbursement of insurance claims that may lead to the re-use of medical supplies may influence HCP behavior towards PLWH and do not augur well for patient care.

Furthermore, the accounts of AHCP and GHCP indicate the absence of clear and readily available HIV policies and guidelines for HIV care especially in other departments' in the hospital, in which case GHCP depended on their experience and discretion. The challenge with HCP using their discretion in managing patients is that it may foster stigma, disclosure, other negative attitudes and behavior towards PLWH without recourse to any guidelines. Literature suggest that the lower perception of protocol-related institutional support was a significant predictor of unethical treatment of PLWH, stigma, unofficial disclosure and the lack of feelings of safety(Feyissa et al., 2012). We argue that the provision of clear policies and guidelines for HIV care, training on these guidelines and optimal adherence to the guidelines may help in reduce stigmatizing and discriminatory behavior of AHCP and GHCP.

The findings of the study have some potential limitations. First, the findings of this study are not generalizable given the use of qualitative method and the number of HCPs interviewed, nonetheless, the use of this method allowed for detail and indepth examination of factors influencing HCP behavior towards PLWH. Secondly, we envisage that, HCPs could give socially desirable responses about their behaviors towards PLWH, especially with Dutch graduate students who conducted some of the interviews. To reduce this, interviewers built rapport with participants before interviews. Again, participants received a brief information on the interview in order not to sway their responses in a particular way. The fact that one facility had recently participated in an anti-stigmatization workshop could also influence HCP responses about their behavior. In addition, we did not explore the HIV knowledge of AHCP assuming they received training on HIV as part of Ghana AIDS Commission processes. Nonetheless, the study presents important insights on the factors that influence the behavior of HCP in ART clinics and those in the other departments towards PLWH. It is one of the first studies in Ghana to the best of our knowledge to explore both individual and external factors influencing the behavior of HCP in ART clinics and other departments of the hospital towards PLWH. Future studies should further explore the role of healthcare managers in shaping HCP behavior towards PLWH.

5. Conclusion and practical implications

The present study shows that although AHCPs and GHCPs said their thoughts or judgments did not influence the way they treat PLWH, there seem to be a subtle expression of stigma and differences in how they treat PLWH as compared to other patients. The study identified some individual and external factors that influenced both AHCPs and GHCPs behavior towards PLWH. Some individual factors such emotions (fear, anger, pity, empathy), attitudes towards PLWH, perceptions of HIV, perceived HIV onset controllability, training received and external factors including, availability of guidelines, logistics and resources, and funding challenges seem to affect HCP's behavior towards PLWH. The adequate supply of logistics, clear policies and guidelines on PLWH treatment, regular reimbursement by the national insurance authority may improve both HCPs behavior towards PLWH. Further research is needed to establish the magnitude and extent of stigmatizing behavior of AHCPs and GHCPs. We suggest the use of Intervention Mapping (IM) (Bartholomew, Parcel, & Kok, 1998) to develop, implement and evaluate interventions targeted at healthcare providers in ART clinics and other departments and their supervisors in order to reduce stigmatisation of PLWH in the healthcare sector, hence improve hospital visits and medication adherence. The use of IM helps in adapting existing interventions to new populations and settings. Theory- and evidence-based interventions enhance the likelihood of effectiveness and may contribute to the well-being, health, treatment adherence of PLWH.

CHAPTER

4

A qualitative analysis of factors influencing the implementation of antiretroviral treatment adherence policy: Stakeholders’ perspective

Manuscript published as:
Abdulai, M. A., Mevissen, F. E. F, Marien, V, Ruiter, R. A., Owusu-Agyei, S., Asante, K. P., & Bos, A. E. A qualitative analysis of factors influencing the implementation of antiretroviral treatment adherence policy in Ghana: Stakeholders perspective. Journal of Health Research Policy and Systems

Abstract

Background: The Joint United Nations Programme on HIV/AIDS launched the 90-90-90 initiative. Failure to meet the target reflects the difficulties in successfully implementing HIV treatment policy. There are research gaps in exploring personal and external factors influencing HIV treatment in Ghana. To fill this gap, we explored individual, interpersonal, community, and structural factors influencing stakeholders' HIV treatment policy implementation in Ghana.

Methods: Fifteen qualitative semi-structured in-depth interviews were conducted among representatives in different management positions at hospitals, health directorates, the Ghana AIDS Commission, the National AIDS and STI control program, and the National Association of People Living with HIV.

Results: Using thematic analysis, the findings suggest that individual and environmental factors such as attitude towards policy, awareness of HIV treatment policy, training received on policy implementation, difficulties related to patient factors, alternate sources of HIV care, inefficient policy decision-making, monitoring and evaluation of HIV treatment policy, lack of HIV treatment policy implementation training, poor availability of logistics, policy and guidelines, infrastructure, organization of training, and staff availability may hinder successful HIV treatment policy implementation.

Conclusion: Several individual, interpersonal, community, and structural factors seem to influence HIV treatment policy implementation. To ensure successful policy implementation stakeholders need to receive training on new policies, availability of sufficient supplies of material resources, inclusive decision-making, receive supportive monitoring of policy implementation, and oversight.

Background

In 2020, an estimated 37.6 million people worldwide were living with HIV, with approximately 27.4 million receiving antiretroviral therapy (UNAIDS, 2021). People living with HIV (PLWH) must take antiretroviral medications in a planned manner in order to achieve sufficient viral suppression (Haas et al., 2016). In 2014, the Joint United Nations Program on HIV/AIDS launched the 90-90-90 initiative, with the goal of having 90% of all people living with HIV knowing their status, 90% of those diagnosed being on treatment, and 90% of those on treatment achieving viral suppression. The achievement of these goals by 2020 should accelerate the end of the HIV epidemic by 2030 (UNAIDS, 2014).

In line with these global goals, Ghana adopted the treat-all-policy in 2016 by following the WHO Consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection (WHO, 2016) which are implemented countrywide. This policy makes every PLWH eligible for treatment and thus increases the number of PLWH on antiretroviral therapy (ART) (UNAIDS, 2017). Following these targets, the Ghana AIDS Commission (GAC) estimates that in Ghana, 77% of the people diagnosed with HIV infection receive sustained antiretroviral therapy. The majority of them (68%) show viral suppression because of the treatment they received (GAC, 2021), which is, however, well below the target of 90% that show viral suppression by 2020. In this paper, we focus on the factors influencing the successful implementation of strategies to achieve 90% ART treatment adherence and viral load suppression.

In Ghana, HIV treatment policy stakeholders such as the Ghana AIDS Commission, National AIDS & STI Control Programme, and National Association of Persons living with HIV, Ghana Health Services (hereinafter referred to as stakeholders) are key agents in HIV treatment policy implementation and the promotion of ART adherence. They make policy decisions, oversee patient care and budgets, plan, direct and coordinate medical and health services. Stakeholders are important agents for leadership, supervision, performance feedback, monitoring the quality of care services, and the implementation of quality improvement processes (WHO, 2016; Rowe et al., 2018). For example, the implementation of the HIV treatment policy in Ghana is led by the Ghana AIDS Commission (GAC), a supra ministerial and multisectoral body that is mandated among others to formulate HIV policies and strategies, mobilize, manage, and monitor resources, and foster linkages and networking of stakeholders (GAC, 2019). The National AIDS & STI Control Program (NACP) under the Ghana Health Service is the technical lead and responsible for HIV treatment policy implementation. Together, the GAC and NACP work closely with non-governmental organizations (NGOs) such as the Ghana Network of persons living with HIV (NAP+), community-based organizations (CBOs), regional, district/municipal directorates, and multinational and bilateral organizations to implement HIV policies, including HIV treatment (GAC, 2019).

Effective policy implementation is critical for successful policy outcomes. Policy implementation is defined as a series of activities undertaken by program managers and others to realize the goals and objectives articulated in policy statements (Bullock & Lavis, 2019). In this case, HIV treatment policy implementation. Stakeholders are incessantly looking for better ways to realize policy goals. Failure to implement policies can cause financial waste, political frustration, and disruption of health services for PLWH (The Institute of Government, 2021). The underachievement of the UNAIDS 90-90-90 targets speaks to the challenges in the implementation of HIV treatment policy in Ghana.

For the promotion of successful policy implementation, it is essential to understand the factors that hinder and facilitate HIV treatment policy implementation by the various stakeholders. Using the socio-ecological model (Busza et al., 2012), we argue that the factors influencing stakeholders' successful policy implementation are situated at the *individual, interpersonal, community, structural, and societal levels* (Williams et al., 2017; Geter et al., 2018), as illustrated in Figure 1.

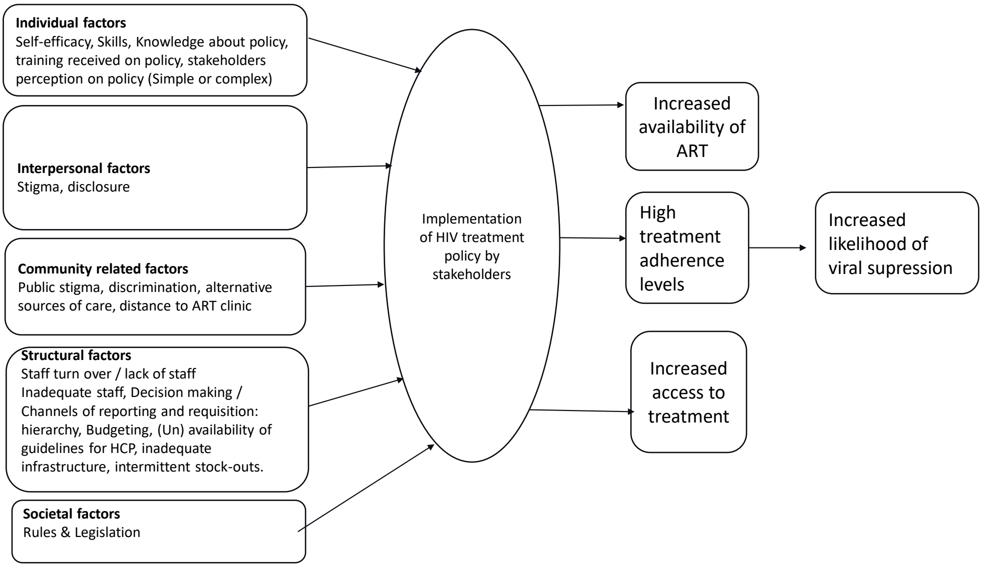


Figure 1: A logical framework of factors influencing stakeholders' implementation of HIV treatment policy.

Individual-level factors such as knowledge, skills, and beliefs influence policy implementation. For example, stakeholders who are knowledgeable about the HIV treatment policy are confident in implementing the policy (Hornschuh et al., 2017), while those with low knowledge may not have the requisite skills for the implementation of HIV treatment policy (Zarei et al., 2015). Stakeholders' understanding and clarity on policy implementation facilitates its implementation (Feyissa et al., 2012; Stringer et al., 2016). Stakeholders who believe that HIV treatment policy is good because it aligns with their personal values are more likely to implement it than those who are not convinced.

Besides the individual factors, ***interpersonal factors*** also influence policy implementation. Undoubtedly, the behavior of the PLWH mediates the successful implementation of the HIV treatment policy towards adherence and viral suppression. For instance, stakeholders may not achieve HIV treatment policy outcomes of 90% treatment adherence and viral suppression due to a patient's decision to discontinue their medication (Abdulai et al., 2022; Birkhäuer et al., 2017). Stakeholders are also influenced by the negative or positive norms of their colleagues in the implementation of HIV treatment policies. For example, when one stakeholder ignores monitoring of the viral load of a patient, colleagues may take a cue from it and do likewise, which over time becomes the norm (Pathirange, 2019). These interpersonal factors may impede HIV treatment policy implementation and need to be addressed.

Community-level factors including stigma, cultural norms, social support, and social networks influence stakeholders' implementation of HIV treatment policies (Underwood et al., 2014). The NACP engages several people at the community level, including religious and traditional leaders, to get their buy-in for policies. When these leaders oppose or stigmatize a policy, it may be difficult to implement it within the community (Underwood et al., 2014; Gregson et al., 2013). Again, a community of persons living with HIV who form a network may equally accept or oppose HIV treatment policies. Given that, the network of PLWH is an important group for HIV policy implementation in Ghana, their opinion about a policy will influence its implementation by stakeholders (Underwood et al., 2014; Gregson et al., 2013).

Structural factors are also relevant to the implementation of HIV treatment policies. For successful policy implementation, it is important that stakeholders find quick and clever ways to overcome difficulties related to infrastructure, logistics, and personnel (Heeringa et al., 2020).

Finally, ***societal factors*** such as HIV-related punitive laws, policies, and practices, especially against key populations, impede stakeholders' implementation of HIV treatment policies towards HIV treatment and viral suppression (KELIN, 2014; UNAIDS 2020). Less progress has been reported towards HIV treatment and viral suppression in countries that criminalize key populations (International Treatment Preparedness Coalition, 2020).

The current study

Policy implementation is influenced by a myriad of personal and environmental factors that vary across developing and developed countries (Church et al., 2015). While available scientific publications on HIV policy in Ghana have so far focused on legal audits of HIV treatment (Health policy plus, 2017), workplace HIV policy (Decardi-Nelson et al), and human rights of PLWH (Laar et al., 2017), there is a scarcity of research on the individual, and environmental (interpersonal, community, and structural) elements that influence HIV treatment policy implementation in Ghana. To fill this gap, our study sought to explore the individual and environmental factors influencing stakeholders' HIV treatment policy implementation using qualitative in-depth interviews with stakeholders that play a key role in the successful implementation of strategies to promote HIV treatment adherence. Knowing the perspectives of stakeholders will help in identifying targets for future interventions at the different ecological levels to promote successful implementation of HIV treatment policies and thus contribute to enhanced ART adherence and viral suppression among PLWH.

Methods

This qualitative study used semi-structured interviews to get an in-depth understanding of the individual and environmental factors influencing the implementation of the HIV treatment policy among stakeholders.

Study area and site selection

Ghana has 16 administrative regions and runs a decentralized system of governance from the national level to the district level. Similarly, the HIV treatment policy implementation follows this decentralized system, hence the need to engage stakeholders at all ecological levels. The study was conducted among stakeholders in the Bono East region and at the national level in Accra. The Bono East region is one of the sixteen regions in Ghana. The capital of the region is Techiman with, a population of 104,212. The Bono East Region covers a total land area of 39,557km2 with over 40 health facilities within the eleven municipal and district assemblies (Ghana Districts, 2018). The region has an HIV prevalence of 1.78% (GAC, 2018). The interviews in the region were conducted in three purposively selected hospitals (Kintampo South District, Kintampo North Municipal, and Techiman Holy Family Hospitals), district/municipal health directorates, and national offices of GAC, NACP and Ghana Network of persons living with HIV (NAP+).

Study Participants

The study purposively sampled 15 stakeholders who are responsible for the coordination of healthcare activities including HIV/AIDS. They have no direct contact with PLWH in their role (see Table 1 for their specific roles in HIV treatment policy implementation (see Table 1). Their ages ranged between 31 and 57 years (median = 42, M = 45.7, SD = 9.7). Five interviewees were female and ten were male (N = 15). The stakeholders work in different management positions at hospitals, health directorates, and the National AIDS Control program (NACP), Ghana AIDS Commission (GAC), and the National Association of People Living with HIV (NAP+). Figure 2 shows the hierarchy and different levels of the stakeholders in HIV care from which we selected our study participants.

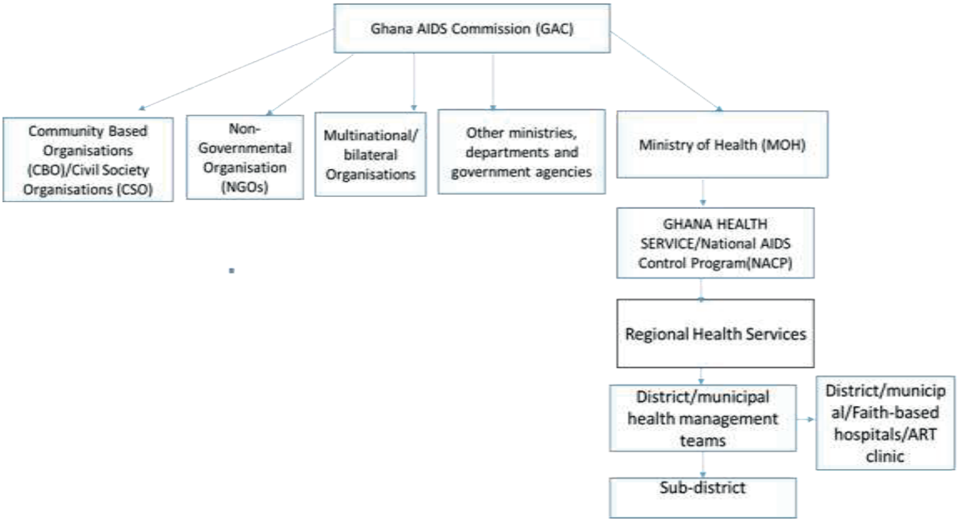


Figure 2: An organogram of stakeholders on HIV treatment policy implementation in Ghana. Source: National HIV/STI policy 2019

Data Collection Procedures

The approval to conduct the study was sought from the heads of institutions. This was followed by a face-to-face meeting with each of them to explain the aim of the study (i.e., exploring the factors influencing HIV treatment policy implementation from the perspective of stakeholders). All eligible participants in managerial and decision-making positions who were approached by the researcher were willing to participate and were included in the study. Two participants were interviewed immediately upon recruitment. For the others, interviews were scheduled at an appropriate time and date. All fifteen interviews were carried out between April 2018 and June 2018 and took place in the offices of the participants. Interviews were held in a private space with, in some instances, a limited number of brief interruptions by incoming people this however, only minimally affected the progress of the interview.

During recruitment and before each interview, the interviewer informed participants about the confidentiality, the voluntariness of their participation, and the possibility to refuse to answer any question or stop the interview without the need for explanation. Participants were told that, for privacy issues, their names are de-identified with unique identifiers. Participants were instructed to avoid mentioning their names or other names in the course of the interviews. Participants were asked for their consent to audio record the interview to make verbatim transcription possible, to which they all agreed. All the interviews were conducted in English. The interviews lasted between 40 minutes and 60 minutes. We reached saturation by the 14th interview; one additional interview was carried out after which we ended the data collection since there were no new and distinct themes emerging.

Interview protocol

The interview protocol was based on concepts derived from the empirical literature and theories on factors influencing the implementation of HIV treatment policies. Interviewees were interviewed about their knowledge and beliefs about HIV treatment policies and guidelines, attitude towards policy, adherence to policy, sources of policy, decision-making structure and protection of PLWH rights.

Data coding and analysis

All 15 recordings were transcribed verbatim. The first and second authors used the qualitative data analysis software ATLAS.ti 9.0 to independently code three interviews. Any different thoughts on the coding were discussed for agreement. The first author coded the remaining interviews. Three types of coding were used: open coding, axial coding, and selective coding. Open coding includes the process of carefully reading the text and conceptualizing, and categorizing the data into fragments with a specific code derived from the data. Axial coding, where the categories were further divided into subcategories, followed this. The last step included selective coding, in which connections between codes were made in order to find relations between different codes. Using the reports of every code, the two authors' summarized all the data. Data that had similar information was combined together.

Several themes emerged and could be categorized as HIV treatment policy implementation behavior of stakeholders and factors influencing this behavior at the individual, interpersonal, community, and structural level.

Ethical approval

Ethical approval for this study was granted by the Ethics Review Board of the Faculty of Psychology and Neuroscience at Maastricht University (ECP_04_09_2012_S22) and the Kintampo Health Research Centre Institutional Ethics Committee in Ghana (FWA00011103).

Results

Below we report on the determinants of HIV policy implementation in two broad categories: individual factors and environmental factors (including interpersonal, community, and structural factors). About implementation of the national HIV treatment policy participants said that the implementation of the policy is mandatory to implement even though health facilities can make minor changes in the implementation strategy to suit their particular needs.

*"The policy is from above (national) and we have to follow it" (**HIV treatment policy stakeholder 6)***

Individual factors influencing HIV treatment policy implementation.

Awareness of HIV treatment policy and guidelines

The majority referred to the national treatment guidelines or the 90-90-90 policy. The majority of stakeholders assumed high to very high levels of adherence among the PLWH at their location. If adherence percentages were given, they stated rates of 90% or above.

"Oh, adherence is good. I think it is 98%. I: 98%? R: Yes." **(HIV treatment policy stakeholder 2)**

Participants mentioned that people who test HIV positive are linked to care to start antiretroviral therapy (ART). Once an individual starts treatment, s/he is supposed to be monitored for viral suppression every six months and subsequently annually.

"Yeah, we do the testing for them as they take the medication; we are supposed to check for their viral loads to see whether there is improvement while on the medication" (**HIV treatment policy stakeholder 10)**

One participant said that the initial policy encouraged treatment support, i.e. someone PLWH trusted to disclose HIV status to help them take ART. However, in order to avoid delays, the current policy states that individuals who test positive are immediately put on ART [this may not give patients ample time to reflect and decide to stay on lifelong treatment for viral suppression]. This assertion may influence the implementation of this policy related to treatment adherence.

"….with the 90-90, once they are tested, they have to be enrolled in the ART…… Previously, they first get to be monitored; somebody will be monitoring their drug intake, but the donors are saying it is delaying the client" (**HIV treatment policy stakeholder 6)**

Attitude towards policy

The majority of the participants were satisfied with the HIV treatment policy guidelines because they considered them important, clear, simple, easy to follow and understandable. They added that the current HIV treatment policy is useful and good, ensures uniformity of procedures across all health facilities, and improves care and adherence.

"Yeah, it [guidelines] improves care, because most of them will hide and then come at the terminal stage of the disease. The earlier you start the better" (**HIV treatment policy stakeholder 3)**

Nonetheless, some participants stated that, while the 90-90-90 UNAIDS goal eliminates delays previously caused by laboratory tests, the current policy is worsening adherence because PLWH default on appointments with excuses [because they no longer have to go through rigorous adherence counseling before starting treatment].

R: "The issue is that now they have introduced the 90-90 policy, it is worsening the situation. The day they are tested; they should be enrolled and start ART; but some default on the appointment time; example If they were supposed to come on the 15th of last month you see the clients coming at the end of this month; with a lot of excuses" (**HIV treatment policy stakeholder 6)**

Some participants were sceptical about the 90-90-90 policy. While one stated that potential patients are immediately put on drugs with the current policy before the CD4 count confirmation, another bemoaned that PLWH are challenged with logistics. If indeed the government is committed to the achievement of the 90-90-90 policy, they should be committed to getting all the logistics available to ensure a smooth transition from the first, second and third 90s.

"The 90-90-90 agenda is to ensure that 90 percent and those of us who are already in the health system; we do not have sufficient logistics to cover even the fewer of us that are already on treatment. Now we are talking about 90 percent coming out to know their HIV status. …. if truly the Ghana government signed the MOU with the United Nation to ensure that the 90 percent persons living with HIV in Ghana know their HIV status. Then whatever it takes for this 90 percent to know their status the government should also be committed to it. It would not be the case that oh we are struggling to get all these 90 percent and when they get to treatment then it becomes a barrier for them to access treatment; I do not think this will help. The second 90 said all those 90 percent when they know their status they should be put on treatment. It means that treatment includes monitoring the viral load system, the CD4 count, the liver function and the other entire test that associated with the treatment…"…" (**HIV treatment policy stakeholder 14)**

Policy-related training received by stakeholders

The majority of the participants said they received training whenever there were new policies or guidelines related to antiretroviral therapy and logistics management, among others. Some of the participants called for more new and refresher training for new and old staff respectively, due to the high staff-turnover of trained staff. They went on to say that due to the unique nature of HIV therapy, there is a need to put counselors through systematic training and train all professionals on how to manage HIV.

R: What I know is that because HIV is a program, not all clinicians have been trained on how to manage HIV, so yes [more training is needed for all physicians]" (**HIV treatment policy stakeholder 10)**

Environmental factors influencing HIV treatment policy Implementation

Stakeholders' difficulty in implementing policy due to patient-related factors

Some stakeholders indicated that patients' non-attendance of clinic appointments, thus default adherence to medication, affects treatment adherence and viral suppression. Some of the reasons they ascribed to patients defaulting include non-disclosure, stigma, and distance to ART/financial challenges [due to these challenges, patients do not show up to receive medication, which influences the achievement of treatment adherence and viral suppression]. Some participants explained the long travel distance because of the communities' being far away from the clinics:

"Money for them to pay the T&T to the facility is a challenge; we have long distances between our facilities. PLWH cannot walk, and the money is not there, they will stay home and default" (**HIV treatment policy stakeholder 12)**

Many participants said stigma is a key issue-influencing treatment adherence for PLWH and subsequently fraught stakeholders' policy implementation, [When PLWH are stigmatized, they may not adhere to their medication, hence high viral load], because of stigma PLWH tend to hide their HIV status, hide medications and travel far distances for medication.

"I will say the major challenge is stigma and a key issue. So most people do not open up about HIV because of the stigma, most people do not take the medications in the town they live in. For example, if the patient lives in Techiman and takes their medication at Techiman Holy Family Hospital people may come to know their HIV status, they would rather go to faraway places like Sunyani…..where nobody knows them" **(HIV treatment policy stakeholder 10).**

Alternative sources of care

The majority of stakeholders expressed concern about the difficulty of implementing HIV treatment policies due to alternative sources of care such as local medication and faith healers. They explained that PLWH are turning to these alternative sources in the hope of finding a cure and in order to alleviate the difficulties associated with taking antiretroviral medication for the rest of their lives. Unfortunately, this causes such PLWH to retrogress [viral suppression] and, in some cases, to die.

Some would come and tell you, ''oo, my pastor says he has prayed for me, and for that matter, the sickness is no more there." This person will be at home for some years, and comes back terminally ill, at which point we can only do little, most of them, even die. In 2015-2016, HIV/AIDS was the highest cause of mortality in this hospital. (**HIV treatment policy stakeholder 9)**

Several participants emphasized that superstitious beliefs about HIV, faith healers, especially pastors in the media space, who claim to cure HIV hinder HIV treatment policy implementation. They bemoaned that even though they educate the populace on HIV treatment, faith healers cause confusion among people by contradicting this information.

Yes, we do education all right but this spirituality is now becoming an issue in Ghana. Moreover, because of the mass media, people have access to radio stations and can spread all sorts of information. Somebody said untreated candidiasis would turn into syphilis, if untreated which will eventually turn into HIV. The way these people speak with passion, the HIV patients tend to become confused as to which one to believe." (**HIV treatment policy stakeholder 10)**

Availability of staff

The majority of stakeholders said there was a lack of or inadequate staff at all levels to provide HIV [treatment] services, especially counsellors and clinicians. This staff shortage or inadequacy overburdens available personnel, causing them to overlook the demands of HIV treatment policy implementation.

"…..we are supposed to run the laboratory 24 hours. We need to run night shifts, and all those things. Here is the case; we are not able to do that because of the problem of staff strength… (**HIV treatment policy stakeholder 16)**

Policy decision-making

Most participants stated that decision-making and the channels of reporting on HIV treatment policy are hierarchical from the national, to the region, to the districts/ municipalities and then to the sub-districts. The districts/municipalities are mostly the policy-implementing sites of the decisions that are made at the national level. When reporting, stakeholders report to the regional, who also report to the national.

We also have our bosses from the national level, regional level and the districts. Most often, we at the district level implement the decisions that come from above, so when it comes to us locally, then we will now look at the national policy. If it is suitable for us, then we go by it, but because of our setting and some peculiar challenges, we make certain amendments to suit our situation. " (**HIV treatment policy stakeholder 5)**

At the facility level, administrators and medical superintendents, in consultation with management, make major decisions about HIV treatment policy implementation. District/municipal directors sometimes endorse these decisions before they are implemented.

"The district director is the general overseer. He approves of whatever decision we want to carry out. Even though I am a coordinator, if I want to do anything, he has to endorse it before I can carry it out, I cannot do things on my own." (**HIV treatment policy stakeholder 12)**

One participant said that national-level decisions about policy implementation could not be challenged; you can only give feedback at the district, regional and sometimes national level. If other facilities report, same results, further research may be launched by the GHS through its research centres.

We are policy implementers. At Ghana Health Service, we implement policies from the Ministry of Health, so when the policy is in and you are trained, you have to implement it and then give your feedback to them. You evaluate and then give feedback. When it is coming, you cannot object." (**HIV treatment policy stakeholder 11)**

Monitoring and supervision of HIV treatment policy

The majority of participants monitored and evaluated the implementation of the policies based on written reports. They mostly focused on "the numbers" (how many people came for a test, do we have sufficient medication, etc.). Only one person very clearly stated that she visits the facilities to see how people are doing their work and if patients are satisfied with the care they receive.

"Once in a while I do visit that place. I do interview clients about their charges and their services: are they satisfied with the services that they are providing… Even this morning I went to the maternity unit, the children's ward, the lab and the dispensary, we came back through ART corner, the antenatal and Out Patient Department" (**HIV treatment policy stakeholder 8)**

One participant said that the Ghana AIDS Commission in collaborations has carried out joint implementation support-monitoring visits to know what is happening at the field level. Findings from the field are then discussed in this quarterly review meetings and feedback to the implementing partners. However, they have not effectively monitored these policies.

We have not effectively also monitored these policies" (**HIV treatment policy stakeholder 13)**

Organization of Training on HIV treatment policy

The majority of stakeholders reported that policy-related training is often organized at the national, regional, and district/municipal levels and participants are expected to train people in their facilities upon return. They also stated that the training is primarily designed for new staff to become acquainted with HIV-related issues, including treatment, and that refresher training is designed for existing staff to learn about new policies and guidelines for practice.

The refresher training for the old ones and then the training for the new ones who are coming in the system (job)" (**HIV treatment policy stakeholder 12)**

Availability of logistics

Some stakeholders stated that logistics such as antiretroviral medicines were mostly available for successful policy implementation. Most others did, often at first, stressing that it was all okay and "people are doing their best". Nevertheless, in the end, almost all participants did mention shortages of logistics such as patient folders, medication, and reagents as well as finances and transportation options (vehicles, motorbikes). Sometimes it was a bit unclear whether there was or was not a shortage because they contradicted themselves throughout the interview, or they stressed the shortage was in the past but no longer.

"I think the national AIDS control program and the Ghana AIDS Commission is doing their best, we have up-to-date drugs and test-kits. We have folders as well. At times, the folders run out of stock….Moreover, the hospital management is doing their best photocopying of some of the sheets so for those who will come as newcomers when we do not have folders from the NACP… At times, we have challenges with the vehicle reaching out to people at home" (**HIV treatment policy stakeholder 9)**

In the event of a drug shortage, all patients receive a one-month supply rather than a three- or six-month supply, implying that patients must travel much more frequently to obtain a new supply.

"For instance, suppose you arrive and HCP informs you that "oooh, there is stock out, so I have to distribute the few available containers with everyone visiting the facility today." ……This also leads to many defaults because when a person has to pay their transportation to the ART center, receives only two weeks' medications, not everyone can afford returning to take more. Some people could give up and say, "Why should I?" and if I die, I die. We've seen a lot of them default due to transportation cost." (**HIV treatment policy stakeholder 14)**

One participant stated that the major challenge with the erratic supply was the fact that the antiretroviral is not readily available in the open market and has to be supplied by the national program.

"I also talked about the inadequate and erratic supply of drugs because sometimes they are unavailable at the national level...and you cannot buy them from outside because they are not sold at the open market…." (**HIV treatment policy stakeholder 12)**

The majority of the participants bemoaned the lack of PCR for patient viral load monitoring [this affects the implementation of the 90% viral suppression goal]. The PCR was unavailable and samples within the region had to be sent to a central location from all health facilities in the region and beyond for testing. They added that the few machines and equipment available periodically break down or are faulty, which delays patient test results. "Yes [it will take at least one month to get the results back]" (**Stakeholder 16)**

Availability of policy and guidelines

Some of the participants stated the availability of several guidelines, including those for adult and paediatric antiretroviral therapy. These protocols and guidelines were said to be in the ART centres. One participant indicated that even though the Ghana Health Service provided general guidelines, sometimes it was difficult to follow because they did not have the gadgets to follow through. As such, they choose and pick based on what equipment are available.

Infrastructure

Few participants said space available for storing enough ART is inadequate, which distracts care, hence ensuring treatment adherence. They bemoaned that it is even more so if you have to attend to a patient with HIV/TB coinfection.

"The clinic is too small and not well ventilated. Uhm…, the records room is not spacious. Moreover, you know, most of them [PLWH] have TB or co-infections. I worry about the health of others given the small nature of cubicles with improper ventilation” (**HIV treatment policy stakeholder 9)**

Discussion

Ghana has made some strides towards the implementation of HIV treatment policy though the targeted 90 90 90 was underachieved (GAC, 2021). The present study provides insights into individual and environmental factors that may influence the implementation of the HIV treatment policy among policy stakeholders using in-depth interviews. The findings suggest that individual factors, including attitude towards policy, low awareness of policy, training received on policy implementation, and environmental factors such as difficulty due to patient-related factors, alternate sources of HIV care, availability of staff, organization of clinic, decision-making, monitoring and evaluation of policy, and organization of training on HIV treatment policy, may influence HIV treatment policy implementation.

Among these factors, training received on HIV treatment policy implementation, decision-making, availability of logistics, monitoring, and supervision seem to have the strongest influence.

Findings from our study indicate that HCPs receive both pre- and in-service training on HIV treatment policies when new policies are introduced. This training is essential for HCPs’ knowledge and skills for HIV treatment policy implementation towards medication adherence and viral suppression. The importance of pre- and in-service training is similar to studies in West Africa and in Asian study investigating stigmatizing attitudes towards people living with HIV/AIDS by doctors and nurses in Vientiane in Lao PDR (Vorasane et al., 2017; Niyogi et al., 2015). In contrast, Rowe and colleagues note that an increase in training alone does not automatically mean HCPs will implement the HIV treatment policy (Rowe et al., 2018). We argue that, indeed pre-service training alone may not be enough for HCPs to implement HIV treatment policies given the changes that occur in the field. This training may not always be adequate for HCP to function in their roles and may not be responsive to the current knowledge and technology in HIV treatment (Vorasane et al., 2017; Hossain & Kippax, 2012; Vasan et al., 2017). As such, it is important to continuously train HCPs on HIV treatment policies to be abreast of changing trends and technology in the field. Scoping reviews in LMIC (Vasan et al., 2017; Nicol et al., 2022) identified in-service and post training support as essential for developing the capacity of HCPs for continuous performance. It could be useful for future research to assess the role of training and content of training in policy implementation as a component of an overall monitoring and evaluation of HIV treatment policy in Ghana.

Our results show that even though participants mentioned that they monitor HIV policy implementation, they mostly did so through reports they received from the field and hardly ever visited to access the fidelity of the reports they received. We contend that HCPs may not implement HIV treatment policies the way they should and therefore require continuous monitoring and evaluation to track and identify gaps that require improvement in the 90-90-90 policy for successful ART adherence and viral suppression among PLWH (Narh-Bana et al 2021). The lack of or limited monitoring and evaluation for HIV treatment policy may result in voluntary implementation of the policy as identified by Phulkerd and colleagues (Phulkerd et al., 2017). Similarly, the end term evaluation of the strategic information component of the NSP 2011-2015 noted weaknesses in monitoring and evaluation of HIV and AIDS at the sub-national levels and most of the evaluations are undertaken at the national level (GAC, 2017). Although participants indicated some level of monitoring and evaluation, there is a need for more facilitative supportive visits to monitor the fidelity of the HIV treatment policy in all health facilities.

The availability of ART at the time of the study was a huge incentive for HIV policy implementation towards ART adherence and viral suppression. Similar to this finding the London "keep doing it" campaign that ensured universal HIV treatment free of cost to patient by UK's National Heal Service among other factors helped in treatment adherence and viral suppression (Lambert Council, 2021). This notwithstanding, of note were periodic shortages of drugs, reagents for viral load testing, and transportation challenges that could stall the implementation of the HIV treatment policy. These inadequate or periodic shortages of drugs and supplies, equipment, transport, and infrastructure undermine the health system's ability to support the successful implementation of the HIV treatment policy. Dalinjong and colleagues in Ghana who synthesised facilitators and barriers with the implementation of the free maternal health policy (Dalinjong et al., 2022) corroborate our finding. Again, a national policy review in six sub-Saharan African countries noted that despite high levels of HIV treatment policy implementation, facilities reported ART stock-outs in the past three months (Ambia et al., 2022). Erratic supply of ART comes with negative consequences on treatment outcomes and patients' motivations to remain on HIV treatment. Indeed, a strong health system is requisite for successful HIV policy implementation as it provides the workforce, equipment, drugs and supplies, transport, information, responsive services, monitoring and supervision (WHO, 2010). The successful implementation of the HIV treatment policy requires a continuous supply of antiretroviral and reagents among other logistics for PLWH to maintain medication adherence and viral suppression.

Our study findings point to the fact that decision-making and the channels of reporting are hierarchical from the national level, to the regions, to the districts/municipalities, and then to the sub-districts. Reporting is from the sub-district up to the national level. The districts/municipalities are mostly the implementing sites of the decisions that are made at the national level. Even though this top-down approach comes with some advantages, when people are involved in decision-making about the implementation of the HIV treatment policy, they feel greater control and own the outcomes of such decisions (Ogunlayi & Britton, 2017). The participants' observance of hierarchy in HIV treatment decision-making that seems not to involve them may influence their behavior towards the HIV treatment policy implementation towards the 90-90-90 goal as corroborated by Ogunlayi and Britton (2017) and requires the needed attention.

The findings of the study have some potential limitations. First, the findings of this study are not fully generalizable given the use of qualitative interviews and the number of stakeholders interviewed. Nonetheless, the use of in-depth interviews allowed for a detailed examination of individual and environmental factors that seem to influence HIV treatment policy implementation. To the best of our knowledge, this is one of the first studies in Ghana to investigate these factors in the implementation of HIV treatment policies. Future studies should use intervention mapping to further explore the fidelity of HIV treatment policy implementation from ART clinics.

Conclusion

Several individual, interpersonal, community, and structural factors seem to influence HIV treatment policy implementation. These include training, monitoring and supervision, the availability of material resources, and decision-making. These factors influencing HIV treatment policy implementation could serve as targets for initiatives to stimulate stakeholders' commitment to successful HIV treatment policy implementation. We suggest the use of systematic approaches such as the intervention Mapping approach (Eldredge et al., 2016) be used to develop, implement, and evaluate HIV treatment policy implementation programs.

List of Abbreviations

Abbreviation	Definition
AIDS	Acquired immunodeficiency syndrome
ART	Antiretroviral therapy
CBOs	Community-based organizations
HIV	human immunodeficiency viruses
GAC	Ghana AIDS Commission
NACP	National AIDS & STI Control Program
NAP+	Ghana Network of persons living with HIV
NGOs	non-governmental organizations
PLWH	People living with HIV

CHAPTER

5

Determinants of medication adherence intention and behavior among people living with HIV in Ghana: A longitudinal study

(Yet to be submitted)

CHAPTER

6

General Discussion

Sub-optimal adherence to antiretroviral therapy (ART) challenges the achievement of the 95-95-95 targets towards eliminating HIV/AIDS by 2030. The goals mean that 95% of all people living with HIV (PLWH) know their HIV status; 95% of PLWH should sustain antiretroviral adherence, and 95% of them should achieve viral suppression by 2030. To intervene in suboptimal ART adherence, it is necessary to have a clear understanding of the individual, interpersonal, community and societal level factors that influence ART non-adherence among PLWH. This dissertation investigated these individual and environmental level context-specific determinants of antiretroviral therapy (ART) adherence behavior of PLWH in Ghana. First, the individual determinants of ART adherence are discussed. Next, interpersonal, community and, societal-level determinants of ART adherence among PLWH in Ghana are discussed. This general discussion also reflects on the methods of the various studies, gives recommendations for future research, and discusses implications for ART adherence interventions.

Individual determinants of antiretroviral therapy adherence

Self-regulation

Self-regulation influences antiretroviral adherence. In Chapters 2 and 5 of this dissertation, self-regulation was identified as an important predictor of antiretroviral adherence among people living with HIV (PLWH). In Chapter 2, it became apparent that self-regulation strategies like using different bottles when traveling (to avoid stigma), memory cues (putting medication in clear vision), and incorporating the medication intake as part of their daily schedules (such as during wake-up, bedtime, breakfast, or dinner times) were believed to be useful for medication adherence among PLWH. The important role of self-regulation was further confirmed using quantitative analysis in Chapter 5. It emerged as a strong predictor of antiretroviral adherence among PLWH. Self-regulation of medication intake helps PLWH reflect on barriers to medication adherence to prevent future occurrences of where they failed. Research conducted in developed (de Bruin et al., 2012) and developing countries (Banas et al., 2017) highlights the contribution of self-regulation to antiretroviral adherence. This includes helping PLWH assess their medication adherence behavior and recognize the barriers and facilitators for medication intake, clinic visits, and keeping appointments (Banas et al., 2017). Wilson and colleagues in a meta-review of the effectiveness of interventions targeting self-regulation to improve adherence to chronic disease medication showed that self-regulatory strategies such as self-monitoring (e.g., keeping a diary of daily antiretroviral intake), or personalized feedback (e.g., receiving feedback on reduction in viral load post-testing) improved adherence (Hennessy et al., 2019; Wilson et al., 2020). Other self-regulatory strategies such as goal setting (e.g., taking ART at 7:00 a.m. daily), barrier identification, and problem-solving showed little evidence of improving adherence (Wilson et al., 2020). This emphasizes the need for self-regulatory strategies such as self-monitoring and personalized feedback to improve adherence of PLWH to ART.

Outcome expectancy

The visible positive outcome on the health of people living with HIV (PLWH) using antiretroviral treatment was a huge motivation for ART adherence intentions and behavior. The findings from Chapters 2 show that all PLWH noted improvement in their condition (HIV) after taking ART, which was a key driver for treatment adherence. For most PLWH, the improved health status has helped them conceal their HIV status and live fulfilling lives as community members with no infections. This finding is consistent with studies conducted in sub-Saharan Africa (Lyimo et al., 2011; Mthembu & Wegner, 2016; Mabunda et al., 2019). PLWHs are positive that if they continue to take antiretrovirals, they will no longer die from HIV; it makes them look very healthy, stronger, and able to work, which reduces potential HIV-related stigma. PLWH could also misinterpret improved health as a cure and stop taking ART without recourse to healthcare providers (Mabunda et al., 2019). The findings highlight the need to create adherence-counseling models that reaffirm PLWH expectations and the implications thereof to maximize treatment outcomes.

Anticipated stigma

The results of the study among people living with HIV (PLWH) in Chapter 2 show that most PLWH merely seem to anticipate stigma, but only a few of them have experienced enacted stigma. The fear of stigma reinforced PLWH's aversion to visiting a nearby ART clinic, and they would rather travel long distances at additional cost for antiretroviral refills. It can be argued that at the root of self-stigma are both anticipated stigma and internalized stigma (Bos et al., 2013; Turan et al., 2018). PLWH with self-stigmatizing behavior in healthcare settings may anticipate stigma. For example, a PLWH who has accepted the perceived norm-violating behavior of prostitution may feel internal shame and assume healthcare providers perceive same. As a result, they would not openly discuss ART concerns with the healthcare provider, not go to the ART clinic to receive medication, hide medication from others to prevent unintentional disclosure, or even miss medication, although their intentions may be good, for fear of embarrassment or rejection by HCPs family or friends. This finding is in line with some studies that reported that anticipation of stigma influenced PLWH adherence to ART (Camacho et al., 2020; Latif, 2020). Addressing anticipated stigma requires individual-level counseling that addresses the stigmatizing beliefs and attitudes of PLWH and enhances skills such as self-esteem, empowerment, and help-seeking that are useful for ART adherence (Camacho et al., 2020). Anticipated stigma did not predict actual adherence to antiretroviral medication, but it negatively predicted the intention to take antiretroviral treatment in Chapter 5. This may imply that PLWH who visit the ART clinic have survived public stigma and are more committed to improving their health. Again, it is unclear which of these sources PLWH refer to in expressing their stigma anticipation. As noted by Turan and colleagues (2017), the source of the anticipated stigma, i.e. partners, friends, peers, and family, makes a difference in how PLWH responds to the anticipation of stigma. For example, when a PLWH anticipates stigma from the healthcare provider, they may have challenges keeping appointments for refills and trusting the physician, resulting in non-adherence. Though this non-adherence behavior may further infuriate the healthcare provider exacerbating stigmatizing behavior towards PLWH. These findings were consistent with previous research (Camacho et al., 2020; Zeng et al., 2020) that found an inverse relationship between anticipated stigma and the intention to take medication. Nevertheless, some studies suggest that anticipation of stigma predicts adherence intentions and behavior because it fuels reluctance for clinic visits, fear of unwanted disclosure, and avoidance of 'give-away' self-regulatory strategies such as pillboxes and reminders (Earnshaw et al., 2013, Lyimo et al., 2014, Sumari et al., 2012; Turan et al., 2017). Further research that explores the specific sources of anticipated stigma and how it influences adherence behavior would be useful.

Perceived behavioral Control

As illustrated by the findings of the fifth chapter, perceived behavioral control was essential for the intention to adhere to medication. Central to perceived behavioral control is the patient's belief in or adherence to medication with ease or difficulty and the regulation of factors that promote or impede this behavior (Ajzen, 1991). People who live with HIV and visit ART clinics are more likely than those who do not attend the facilities to be in control of resources and overcome barriers to adhering to antiretroviral therapy. Similar to the findings of other studies, perceived behavioral control accounts for 60% -70% of the variance in ART adherence intention and behavior (Abraham et al., 1999; Banas et al., 2017; Biddle et al., 2020; Sheikh et al., 2022). I believe the availability of resources and PLWH ability to regulate the barriers to antiretroviral therapy adherence influence their adherence behavior. They may be confident in their capacity to adhere, but they must have adequate resources under their control to achieve the benefits of ART.

Resilience

The study's findings in chapters 2 and 5 indicated resilience as a predictor of ART adherence intention and behavior. The results of the study among PLWH in Chapter 2 suggested that PLWH psychologically adjusted to living with HIV by comparing it to other conditions that they perceived to be more life-threatening than HIV, such as hypertension, diabetes, and hepatitis (Abdulai et al., 2022). Giving HIV a positive connotation can help people cope with the condition psychologically (Dulin et al., 2018). Resilience is a combination of attributes such as optimism and determination; it allows

PLWH to cope with HIV, accept their limitations, re-adapt, and adhere to ART (Dale et al., 2014; Dulin et al., 2018). According to published studies and systematic reviews on resilience in chronic diseases, those who are mentally prepared for the disease are better prepared to deal with it (Farber, Mirsalimi, Williams, & McDaniel, 2003; Dulin et al., 2018; Cal et al., 2015; Lovette et al., 2016; Folayan, Ibigbami & Lusher, 2022). The participant's ability to manage psychologically with their HIV status, in my perspective, represents PLWH's ability to live positively with the infection. Resilience can potentially increase the psychological well-being of PLWH while motivating their adherence intentions and behaviors.

Interpersonal determinants of antiretroviral therapy adherence

The attitude of HCP toward PLWH

Chapters 2 and 3 point to mixed findings on the behavior of healthcare providers (HCP) toward people living with HIV (PLWH). Though PLWH in Chapter 2 expressed a positive relationship with HCP, Paper 3 reveals that HCP in both ART clinics and the general healthcare setting seem to subtly express stigma and treat PLWH differently. HCP in ART clinics typically exhibit positive stigmatizing behaviors (overly favoring PLWH), whereas those in general healthcare consistently exhibit negative stigmatizing behaviors (gloving with PLWH-only). Published research in both developing and developed countries points to mixed findings of positive and negative behaviors associated with HCP (Dapaah, 2016b; van der Geest & Sarkodie, 1998; Stutterheim et al., 2014). An explanation for the positive and negative relationship among HCPs could be due to being in either ART clinics (AHCP) or general healthcare settings (GHCP). Given that HCPs in ART clinics frequently encounter PLWH, it makes sense that they would view them favorably and experience less anxiety when dealing with them; however, they still engaged in subtle stigmatizing behaviors toward PLWH. This is contrary to the contact hypothesis which, suggest that prejudice and conflict in a group can be reduced if members interact (Pettigrew & Tropp, 2008). This finding was rather surprising given that healthcare providers would necessarily receive additional training in HIV counseling, testing, and treatment. This training is expected to equip them to treat PLWH professionally and provide a better understanding of the risks associated with caring for PLWH. Research conducted in sub-Saharan Africa (Dapaah, 2016b; USAID, 2006; Horizons, 2007) notes that training resulted in a greater willingness of healthcare providers to care for PLWH with less stigmatizing behavior, which parallels the findings in chapter 3. Some explanations for this behavior include the fact that, contrary to their profession of being compassionate, both healthcare providers in ART clinics and general healthcare settings may hold some prejudices about HIV rooted in socio-cultural values such as serophobia; an aversion to, disdain for, or fear of people living with HIV, which may influence their behavior towards PLWH (Adetoyeje et al., 2008). Another possible reason is the subtle actions, like exaggerated kindness, of benevolent healthcare providers, who may lack the self-efficacy and skills to interact with PLWH (Fominaya et al., 2016). Such actions have been linked to low self-worth, low self-esteem, and decreased empowerment for PLWH (Stutterheim, 2011; Fominaya et al., 2016). Healthcare providers either in ART clinics or general healthcare settings need to be aware of their behavior towards PLWH and how this influences their adherence to ART. The stimulation of this awareness would improve healthcare providers' appraisal and empathy skills toward improving PLWH adherence to ART.

Social support

In Chapter 2, the support that participants received from partners, family, or friends varied from financial support, help with collecting medication, and receiving food to receiving reminders for medication intake and advice, and real emotional support, care, and encouragement. However, the support seemed mostly financial. Some participants described the support they received from partners and family members as empathic, loving, trusting, and caring. Conroy et al. (2017) found that social support has an instrumental (giving materials, money), informational (giving knowledge, the guidance of advice), or emotional (feelings of trust and love) impact on ART adherence. Social support helps PLWH psychologically adjust to illness, improve efficacy, and reduce morbidity and mortality. Similarly, several studies report on the role of social support, especially in lifelong treatments such as HIV (Adisa et al., 2017; Conroy et al., 2017; George & McGrath, 2019; Wang et al., 2019). Loneliness and lack of social support for PLWH may increase their likelihood of depression (Turan et al., 2017). I contend that PLWH in care have greater social support and derive its benefits, although the quality and trustworthiness of their relationship with their partner, family, and friends are also key to ART adherence. Leveraging the important role of social support in PLWH ART adherence in intervention development is worth exploring.

Community determinants of antiretroviral therapy adherence

Community members' perceptions of HIV

The study among PLWH in Chapter 2 pointed to community members' negative response towards PLWH, even if it was a mere suspicion that they were HIV positive. The suspicion leads to gossiping or insults. However, when PLWH are looking healthy (because of ART), these responses stop. Community members' negative responses could be fueled by misconceptions around HIV, such as perceived contagiousness, perceived severity, personal responsibility, and norm violation as noted in the literature (Bos et al., 2008). These cognitive representations shape community members' perceptions of HIV and negative responses to PLWH. For instance, communities' association of HIV with norm-violation behaviors such as promiscuity comes with disdain towards PLWH.

Similar associations with HIV misinformation have been reported in sub-Saharan Africa (Bernardi, 2002; Sano et al., 2016; Tenkorang et al., 2013; Bernardi, 2002; Sano et al., 2016) and Asia (Bhowmik & Biswas, 2022). These misconceptions undermine the ART adherence of PLWH. For instance, PLWH in a community that believes HIV is a spiritual disease are likely to focus on faith healing rather than take antiretroviral treatment (Wüthrich-Grossenbacher, 2022). Interventions that use cultural similarity (culturally similar people) with messages that address their beliefs could lead to a positive reception of the correct HIV messages (Eldredge et al., 2016).

Community stigmatization towards PLWH

Drawing on the perspectives of people living with HIV (PLWH) in Chapter 2 of this dissertation, community members manifested stigmatizing behaviors towards PLWH if they suspected that they were HIV positive. In Chapter 2, stigmatization manifests as abandonment, gossiping, insults, and avoidance. Community members who avoid PLWH could exclude them from social gatherings and not touch PLWH or anything that belongs to them (food, drinks, etc.). Social interactions that separate us (PLWH) from them (community members) are a manifestation of social stigma. In such interactions, PLWH lose the social value that affects their emotions, cognition, and behavior such as disclosure decisions and adherence to medication (Link & Phelan 2001; Turan et al., 2017). In sub-Saharan Africa, HIV-related stigma underlies most of the challenges with ART non-adherence (Ammon et al., 2018). The management of antiretroviral therapy (ART) in a stigmatized setting presents difficulties for PLWH, so common behavioral techniques for enhancing ART, such as the use of alarms or text message reminders and putting drugs in plain sight, may not be appropriate. PLWH may turn to alternatives such as adherence-compromising strategies like hiding or repackaging ART. Research conducted in developed (Turan et al., 2017) and developing countries (Kalichman et al., 2019b) corroborates these findings. For example, Kalichman and colleagues report that PLWH in stigmatizing environments forgo their ART to avoid stigma. Such PLWH are more likely to secretly keep ART, change ART bottles, relabel the medication bottles, or lie about their medication intake.

Alternative sources of care

Superstitious beliefs lead some people living with HIV (PLWH) to believe in the need for complementary faith healing to get a cure for HIV. In chapter 4 of this dissertation, stakeholders expressed some concerns about the difficulty of implementing HIV treatment policy towards antiretroviral adherence and viral suppression because of the influx of herbalists and faith healers who promise cure for HIV. Sadly, PLWH patronize them, hoping to find a cure and avoid lifelong treatment. Unfortunately, they mostly end up worse and may die. Adeoye-Agboola and colleagues in West Africa (Adeoye-Agboola et al., 2016) and Merten et al. (2010) in a meta-ethnography in sub-Saharan

Africa (Merten et al., 2010) previously established the link between superstitious beliefs and traditional medicines for HIV. I suggest that healthcare providers should address PLWH's need for a cure during adherence counseling. They should reassure PLWH that optimal adherence means the virus becomes undetectable and untransmittable as long as they continue their antiretroviral treatment.

Societal determinants of antiretroviral therapy adherence

Availability of logistics

The availability of logistics is important for optimal adherence. The shortage of some logistics and resources, such as gloves for protection, was reported in chapters 3 and 4 of this dissertation. These shortages affect not only healthcare providers' (HCP) behavior towards people living with HIV (PLWH) but also support discriminatory practices and cause conflict between PLWH and HCP. These findings are corroborated by research conducted in sub-Saharan Africa, Asia, and some high-income countries (Feyissa et al., 2012). For example, Sadob and colleagues reported that healthcare providers were ready to care for PLWH if they had protective pieces such as gloves. Feyissa and colleagues (2012) in southwestern Ethiopia reiterated that disputes between PLWH and HCP were a result of a lack of materials and supplies. This is because the lack of logistics supports discriminatory practices. According to Cohen and colleagues (2009; 2016), for HCP to provide adequate care to PLWH, it is important for policy stakeholders to provide the logistics for patient care. This may entail providing necessary equipment, more basic furniture, and supplies, as well as enhancing infection control, occupational health procedures, and knowledge on treatment as prevention dubbed "Undetectable equals Untransmittable" (Cohen et al., 2009, Cohen et al., 2016). In treatment as prevention, PLWH who adhere to their medication have undetectable viral load and as such cannot transmit HIV to their contacts (Cohen et al., 2016).

Chapters 3 and 4, report that antiretroviral medicines were available, and this was a huge motivation for HIV policy implementation. Of note, however, were periodic shortages of drugs, reagents for viral load testing, and transportation challenges that could stall the implementation of the HIV treatment policy. A national policy review in six sub-Saharan African countries noted that despite high levels of HIV treatment policy implementation, facilities reported ART stock-outs over a three-month period (Ambia et al., 2017). Inconsistent ART supply has an impact on PLWH's overall health and reduces their motivation for clinic visits, and thus adherence. For PLWH to sustain medication adherence and viral suppression, the successful execution of the HIV treatment policy requires among other logistics a constant supply of antiretroviral and reagents. The findings yielded similar results in some case studies in four sub-Saharan African countries that report that an erratic supply of ART has dire consequences for treatment adherence and outcomes (Médecins Sans Frontières, 2015). For example, Bukenya and colleagues

(2017) in a multi-country qualitative inquiry noted that irregular ART stocks do not allow the implementation of differentiated care where stable PLWH receives multiple months' supply of ART. The differentiated care model gives PLWH extra time to receive support from healthcare providers and reduces the frequency of clinic visits (Philips et al., 2015).

Training of HCP

Healthcare provider training is critical for healthcare delivery. It helps equip the healthcare provider with the requisite behavior, skills, and knowledge for delivering high quality, safe, and patient-centered care. In Chapter 3, healthcare providers (HCP) showed that whenever there are new HIV treatment policies, they receive training on them. This training is essential to update them on the current treatment policy and practices for medication adherence and viral suppression. The literature corroborates these findings. For example, in a scoping review on pre-and in-service training in low and middle-income countries, Nicol and colleagues (2019) note that, although pre-service training is necessary for skills acquisition, extra in-service training and supportive supervision are needed for healthcare providers to work effectively on their assigned tasks. Research conducted in West Africa (Niyogi et al. 2015) and south-eastern Asia (Vorasane *et al.* 2017) similarly report on the need for periodic training to enhance healthcare provider knowledge, self-efficacy, and skills to provide optimal services to PLWH toward respectful patient management and improving antiretroviral adherence.
Interestingly, in Chapter 2, though healthcare providers in ART clinics received in-service training, contrary to expectation, this did not seem to lead to a greater willingness to care for PLWH. Similarly, Rowe and colleagues, in a systematic review of the effectiveness of training strategies to improve healthcare provider practices in low and middle-income countries, reported that an increase in training alone does not automatically improve implementation, meaning healthcare providers will not necessarily implement the HIV treatment policy because of the training they have received (Rowe *et al.* 2018). I contend that, though healthcare providers received the requisite knowledge and skills to work with PLWH, they may not always result in implementation and would require supportive supervision to adequately function in providing care to PLWH. Again, it is unclear whether healthcare providers are aware of pre-exposure prophylaxis or treatment as prevention (U*ndetectable equals Untransmittable).* (Cohen et al., 2016). This implies that when people living with HIV adhere to antiretroviral treatment, they are less likely to transmit HIV to healthcare providers. This knowledge should allay their fears of HCP contracting HIV in the course of their work.

Monitoring and evaluation of the implementation of HIV policies

Monitoring and evaluation are necessary to track the fidelity of the HIV treatment policy towards ART adherence and viral suppression. The evidence from Chapter 3 shows that training did not seem to translate into a greater willingness to care for PLWH. This finding calls for frequent monitoring and evaluation of the HIV policy's implementation. In this chapter, I note that field monitoring was very limited, but supervisors rely largely on reports they receive from the field. Even though participants mentioned some level of review and monitoring, there is a need for more supportive visits that facilitate monitoring the fidelity of the HIV treatment policy across all healthcare facilities. The lack of or limited monitoring and evaluation of the HIV treatment policy may cause the voluntary implementation of the policy, as identified by Phulkerd and colleagues (Phulkerd et al., 2017). Similarly, the end-term evaluation of the strategic information component of the National Strategic Framework 2011-2015 in Ghana noted weaknesses in the monitoring and evaluation of HIV and AIDS at the sub-national levels, while most of the evaluations are undertaken at the national level (GAC 2017). It can be argued that, HCPs may not implement HIV treatment policies the way they should and therefore require continuous monitoring and evaluation to track and identify gaps that require improvement in the 95-95-95 policy for successful antiretroviral therapy adherence and viral suppression among people living with HIV.

Strengths and limitations

The studies presented in this dissertation fill a gap in the literature on individual and environmental determinants of ART adherence in Ghana. The diversity of respondents (i.e., PLWH, HCPs, and policy stakeholders) in examining contextual individual and environmental factors provides a comprehensive overview of determinants of ART adherence in Ghana.

A clear strength of this dissertation is the mixed-methods design that includes both quantitative and qualitative approaches. The mixed-methods design provides a comprehensive overview of the research topic and draws on the potential strengths of both methods including testing hypotheses in a large population and a detailed and in-depth examination of issues in smaller populations. Apart from this, mixed methods allow for a diversity of perspectives from individuals and agents within their environment and uncover the relationship between these. Using both methods provides triangulation and enhances the validity of the study findings (Shorten &Smith, 2017). In all the qualitative studies, data saturation was reached. The use of a longitudinal study design and the use of an objective Medication Event Monitoring System for measuring adherence are also strengths of the dissertation.

Of note are limitations, including the generalizability (Denny & Weckesser, 2018; Smith 2018) of the qualitative studies (Chapters 2, 3, and 4) among people living with HIV, healthcare providers, and policy stakeholders in Ghana. Qualitative research provides insights and understanding of PLWH experiences and provides an understanding of potential barriers and facilitators of successful implementation of interventions, but they are however not quantifiable. Furthermore, the in-depth interviews (IDIs) were conducted in facilities within peri-urban communities in Bono and Bono East and may not be the same in urban settings or under different administrative strategies in ART clinics. Last, in Chapter 5 of this dissertation, even though I used previously validated tools in a similar resource-limited setting and piloted tools before starting the study, I note that similar to other medication adherence studies (Wang et al., 2012; Liddelow, Mullan, Novoradovskaya, 2020), the psychosocial data were largely skewed, with a marked ceiling effect, meaning that the majority of the responses were close to the upper limit or got the highest possible scores. This resulted in little variance in the data. The ceiling effect may be due to some limitations inherent in face-to-face, self-reported, facility-based studies. This includes recall bias, and social desirability bias, i.e., PLWHs give responses they consider socially acceptable to interviewers, and PLWHs who are less adherent are less likely to show up at the clinic. Therefore, the responses of PLWH who were interviewed may be different from those who visited the clinics. The findings, however, provide relevant suggestions for antiretroviral therapy (ART) adherence that may be transferrable to other regions of Ghana and low- and middle-income countries, but confirmatory research is needed.

Recommendations for future research

This dissertation has contributed to the understanding of antiretroviral medication adherence, but more gaps remain. This dissertation has focused on the individual and environmental determinants of ART adherence in Ghana at the facility level, but not on the broader community beliefs and endorsement of HIV. For example, a few misconceptions and misinformation about HIV were noted among PLWH and HCP in chapters 2 and 3, so it is worthwhile to investigate the extent to which community members endorse these myths and misconceptions at the community level and how they influence stigma and care engagement using mixed methods. The results from this study will inform awareness campaigns to correct erroneous beliefs among PLWH and guide the practices of healthcare providers.

The contrasting findings of chapters 2 and 4 on the role of anticipated stigma in ART adherence in Ghana called for more research. In this dissertation, Chapter 2 elaborates on how anticipation of public stigma influenced PLWH medication adherence but interestingly the findings in Chapter 5 did not support this finding. HIV-related stigma has been established as a barrier to antiretroviral adherence (Mbuagbaw et al., 2012; Stutterheim et al., 2014; Subu et al., 2021), but more research is necessary. For example, more research that furthers the understanding of the manifestations and consequences of stigma will guide the development of a tailored stigma reduction strategy to enhance ART adherence among PLWH. Future research needs to explore, in more detail than has been the case in this dissertation, how PLWH copes with HIV-related stigma. Understanding the extent to which PLWH uses adaptive coping to improve adherence and maladaptive coping strategies that exacerbate non-adherence to ART is necessary. The identification of and the extent to which they used these coping strategies would be useful for the development of interventions that support PLWH and promote the use of the adaptive coping strategies which are most beneficial for PLWH medication adherence (Velloza et al., 2020). For example, PLWH's use of adaptive coping strategies such as support seeking (both emotional and instrumental) and positive reframing positively related to psychological well-being and medication adherence (Turan et al., 2017). Substance use, self-blame, and behavioral disengagement yielded greater psychological distress and non-adherence (Kinzig et al., 2013; Turan et al., 2017; Velloza et al., 2020).

Another area of research that should be expanded relates to social interactions between healthcare providers and people living with HIV (PLWH). Literature shows that the direct contact between PLWH and others can function to reduce stigmatization (Pettigrew & Tropp, 2006; Feyissa et al., 2012), contrary to this knowledge, the study findings in Chapter 3 showed that both healthcare providers in the antiretroviral clinics and the general healthcare setting exhibited stigmatizing behaviors towards PLWH though it was in opposite directions. It would be worthwhile to more extensively examine these interactions and strategies that would enhance social support and empathy for antiretroviral therapy adherence. As noted in the literature, both perceivers and targets can influence the likelihood and extent of stigmatizing behavior in social interactions either through verbal or non-verbal communication (Bos, 2013; Hebl & Dovidio, 2005).

Evidence suggest that, PLWH who adhere to antiretroviral therapy have a life expectancy comparable to the general population. In chapter 5 of this dissertation, I note that PLWH who were 55 years and above were more likely to adhere to antiretroviral than the young people living with HIV in Ghana. This finding calls for more exploration of the factors influencing geriatric HIV antiretroviral adherence and further exploration of factors influencing young people's non-adherence to antiretroviral therapy. Moreover, a follow-up study that quantitively examines the relative relevance of socio-cognitive and structural factors in predicting HCP behavior toward PLWH is warranted. It could be useful for future research to assess the role of training and the content of training in policy implementation as a component of the overall monitoring and evaluation of HIV treatment policy in Ghana. Finally, the important role of social and emotional support from family, friends, peers, and healthcare providers as highlighted in chapters 2 and 3 should be further explored in a quantitative study to examine the relative importance of these factors in ART adherence.

Implications for antiretroviral treatment adherence interventions

The findings of the studies reported in this dissertation contribute not only to the understanding of factors influencing antiretroviral adherence but also have implications for the practice of improving HIV medication adherence. In general, multi-faceted interventions targeting multiple levels are promoted (Bos, Schaalma, & Pryor, 2008; Mahajan et al., 2008; Pugh et al., 2022). Various psychosocial interventions that are grounded in theories have also been documented to improve medication adherence and the health of people living with HIV (PLWH) (Spaan et al., 2020; Costa-Cordella et al., 2022). Intervention mapping (IM) is a framework that uses theory and evidence for the development of interventions at multiple levels (Eldredge et al., 2016).

Intervention Mapping (IM) is an iterative tool that uses an ecological approach for identifying problems and providing solutions to the problems (Kok et al., 2016). This ecological approach to IM provides a unique opportunity for multi-faceted interventions at different ecological levels. Intervention mapping uses a participatory approach in which target group members, experts and stakeholders are intensively consulted during the development process. IM has six steps, and each of these steps of IM comprises several tasks, each of which integrates theory and evidence (Eldredge et al., 2016). The completion of the tasks within a step creates a product that is the guide for the subsequent step. The completion of these steps serves as a map for designing, implementing, and evaluating an intervention based on a foundation of theoretical, empirical, and practical information.

The focus of this dissertation was mainly on Step 1 of IM, which applies an ecological approach to problem identification. As such, a needs assessment that looked at the individual and environmental determinants of antiretroviral adherence in Ghana was done. In this step, I defined the priority population (PLWH) and environmental change agents (HCP and policymakers); reviewed relevant literature and theories for additional constructs, and brainstormed from which a logical model of the problem of non-adherence to antiretroviral therapy was developed to guide the study. Field research including individual in-depth interviews were conducted with 20 PLWH and three focus group discussions (Abdulai et al., 2022), 33 healthcare providers (Abdulai et al., 2023), and 15 policymakers (Accepted). In addition, I did a six-month follow-up survey with 750 people living with HIV to corroborate the qualitative findings and to assess the relative importance of determinants in predicting adherence intention and behavior.

The needs assessment offered a wide view of the behavioral and environmental factors that affect PLWH intrapersonal and interpersonal relations and shed light on the need for social skills strategies and methodologies that address the realities of people living with HIV, the context in which they live, and the capacities they require to achieve optimal adherence and well-being.

The findings in chapter 2 of this thesis point to the need for theory and evidence-based interventions that are tailored to empower PLWH and change the beliefs that contribute to HIV-related stigma in the community. In particular, Chapter 2 recommends the implementation of community-based interventions that not only provide information and increase knowledge regarding HIV transmission, prevention, and treatment but also target PLWH, partners, families, and healthcare providers as change agents within the community to improve PLWH adherence behavior. The findings further suggest that, even though ARTs are free of cost to PLWH, transportation costs were a barrier to a clinic visit for an antiretroviral refill and hence adherence. One strategy that can promote clinic visits and subsequent ART adherence among PLWH is to empower them through income-generating activities such as microfinancing and vocational skills training (Dworkin and Blankenship, 2009; Rosenberg et al., 2011; Rotheram-Borus et al., 2012; Nadkarni, Genberg & Galárraga, 2019). These published studies highlight the benefits of income-generating activities including financial independence, eliminating transactional sex, maintaining power within relationships, and building social capital by interacting with peers. This, however, should be done with adequate support and training in financial management.

Support for PLWH is necessary, especially given the findings of the study among PLWH and healthcare providers in Chapters 2 and 3. These two chapters have shown that PLWH endures negative psychological, social, and health consequences because of HIV-related stigma that affects medication adherence. The study among PLWH also showed the importance of social support in mitigating the negative effects of stigmatization. PLWH with greater social support have less psychological distress, optimally adhere to ART, and cope better with an improved quality of life (Conroy et al., 2017). Evidently, a practical implication of the study findings in this dissertation is that PLWH must be provided with adequate social and emotional support. Interventions that target families and healthcare settings are necessary. To guide its appropriate reintegration into PLWH treatment initiation, it may be useful to revisit and review the treatment support initiative (where a PLWH must tell someone they trust as an accountability partner). Having no treatment partner has been associated with an increased likelihood of treatment non-adherence (Heestermans et al., 2016).

The awkward social interaction in the healthcare settings noted in Chapter 3 of this dissertation may not necessarily be the result of negative intent and stigmatizing behavior but rather a lack of interaction skills and/or familiarity with HIV and PLWH. The development of social interaction skills through information-based and skill-building approaches (Nyblade, Mingkwan, and Stockton, 2021; Spaan et al., 2020; Costa-Cordella et al., 2022) must therefore be a central component of these HIV-related stigma reduction interventions for spouses/partners, family, and healthcare providers. The information-based approach is used to raise awareness and knowledge about HIV and how it manifests and affects the health of people living with HIV. On the other hand, skills-building approaches build opportunities to cultivate the right skills to interact with people living with HIV. Additionally, the enforcement of the existing policies and laws may be an expedient approach to reducing HIV-related stigma among healthcare providers towards PLWH. Finally, the contact hypothesis suggests that prejudice and conflict between groups can be reduced if members interact (Pettigrew & Tropp, 2008), as such contact approaches that expose HCP (especially those with less contact) to PLWH may help develop empathy, humanize PLWH, and break down stereotyping (Nyblade et al., 2019).

Concluding Remarks

In this dissertation, I first presented the individual factors influencing ART adherence. Although I highlighted the importance of these individual factors in ART adherence behavior, different agents within the socio-ecological model influence them. Second, in explaining how the various agents influence PLWH adherence behavior, I called attention to the factors that influence one of such agents, the healthcare provider's behavior towards PLWH. It was apparent that community-level factors that are deeply rooted in socio-ecological underpinnings influenced both PLWH and HCP. Lastly, the legitimization of social and cultural norms and the availability of HIV treatment policies that enhance guided practice among HCPs at the societal level further influence ART adherence behavior. In conclusion, the dynamics of PLWH ART adherence behavior are such that it needs an acknowledgment of the importance of each level within the ecological model, i.e., individual, interpersonal, community, and societal levels. Some behavior change techniques, such as persuasion at the individual level, enhancing network linkage at the interpersonal level, social action at the community level, and agenda setting at the societal level, will be useful for PLWH’s antiretroviral adherence behavior.

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Impact of Dissertation

The valorization section describes the social value of this dissertation. It outlines the relevance of this work, the stakeholders who may be interested in the findings of this study, the emerging activities informed by the conclusion, the innovation, and how the findings would be implemented for wider global benefit.

HIV remains a problem in sub-Saharan Africa, where over 60% of people living with HIV worldwide live. The introduction of highly active combination antiretroviral therapy (ART) in the mid-'90s (Tseng et al., 2015) effectively changed HIV from a once deadly disease to a chronic, manageable condition (Deeks et al., 2013; Tseng et al., 2015). With 72.9% of people living with HIV on antiretroviral treatment worldwide (UNAIDS, 2021), adherence is important to achieving “undetectable equals untransmittable.” The main aim of the dissertation was to examine the individual and environmental determinants of antiretroviral treatment adherence in Ghana among people living with HIV (PLWH), healthcare providers (HCP), and policy stakeholders. The findings of this dissertation are of interest to people living with HIV, several institutions and agencies. The findings of this study support a contextual understanding of the individual determinants of PLWH antiretroviral adherence behavior that will inform intervention development to enhance adherence for optimal health. Again, the findings expose some factors in the health system that may influence PLWH’s interactions with healthcare providers at the hospital and antiretroviral clinics and facilitate healthcare providers’ stigmatizing behavior towards PLWH. These behaviors have been shown in this dissertation to challenge clinic visits, hence non-adherence to antiretrovirals. Further, the findings of these studies provide evidence for tailored interventions aimed at achieving UNAIDS the "95-95-95 Fast Track Target" strategy by the year 2030; 95% of all people living with HIV know their HIV status; 95% of all people diagnosed with HIV infection receive sustained antiretroviral therapy; and 95% of all receiving antiretroviral therapy will have viral suppression (UNAIDS, 2021). This goal has been adopted by the Government of Ghana through the Ghana AIDS Commission and National AIDS Control Program, which target getting all PLWH on ART and those on ART to be virally suppressed. Additionally, the findings of this work will also be relevant for civil society and non-governmental organizations that provides services to PLWH. These organizations and agencies could use the evidence in this dissertation as a useful basis for advocacy and engagement with the government when it is necessary to foster collaborations. The author works as a research fellow at the Kintampo Health Research Centre, within the Research and Development Division of the Ghana Health Service. The findings of this research will serve as a baseline for interventions aimed at improving PLWH antiretroviral therapy adherence, the HCP-PLWH relationship, stakeholder engagement of PLWH and HCP, and the implementation of HIV treatment policy in Ghana. Lessons learned could also be used in future research and inform the implementation of other health-related policies in Ghana.

Summary

The introduction of highly active combination antiretroviral medication (ART) dramatically transformed HIV from a deadly disease to a chronic, manageable condition in settings where treatment is widely available. Non-adherence to ART has been linked to an increased risk of uncontrolled viral load, medication resistance, treatment failure, and increased virus transmissibility. Promoting ART adherence among people living with HIV (PLWH) requires a clear understanding of context-specific individual and environmental determinants of ART adherence. The five studies reported in this dissertation have been conducted to gain insights into the factors influencing ART adherence among PLWH in Ghana and recommend ways to improve adherence.

In Chapter 2 of this dissertation, the individual and environmental factors influencing antiretroviral adherence among PLWHs in Ghana were explored. Twenty semi-structured in-depth interviews and three focus group discussions were conducted among PLWHs, suggesting that both individual and environmental factors, including treatment outcome expectancy, coping skills, self-regulation, healthcare-provider interaction, family and partner support, and transportation cost, influence ART adherence among PLWHs. Interventions that, for example, empower PLWH and reduce HIV-related stigma in the community will most likely support antiretroviral adherence.

Chapter 3 describes a study that used in-depth qualitative interviews involving thirty-three HCPs (e.g., nurses, physicians, and biochemists) in Ghana. Combining two studies, the individual and external factors influencing HCP behavior towards PLWH was explored and the behavior of HCP in antiretroviral therapy clinics (AHCP) were compared with HCP in general healthcare settings (GHCP). Thematic analysis of the interviews reveals that while AHCP and GHCP claim that their thoughts and judgments did not influence how they managed PLWH, there appear to be reflections of sympathy or positive discrimination, particularly among healthcare providers in ART clinics. In addition, the study results show that individual factors such as perceptions of HIV, attitudes towards HIV patients, different emotions (fear, pity, anger, and empathy) and training received. The external factors included availability of guidelines and logistics, infrastructural and reimbursement challenges influence AHCP and GHCP behavior towards PLWH and would benefit interventions that address the behavior and emotions of both AHCPs and GHCPs to reduce the stigma of PLWH in the healthcare sector, thereby improving hospital visits and medication adherence.

Chapter 4 describes a study involving 15 HIV/AIDS treatment policy stakeholders in Ghana. The study aimed to explore individual, and environmental (interpersonal, community, and structural) factors influencing stakeholders' HIV treatment policy implementation in Ghana. The results show that individual factors including attitude toward policy, awareness of HIV treatment policy, training received on policy implementation, and environmental factors such as alternate sources of HIV care,

inefficient policy decision-making, inadequate monitoring and evaluation of HIV treatment policy, lack of HIV treatment policy implementation training, poor availability of logistics, policy, and guidelines, infrastructure, organization of training, and staff availability seem to influence HIV treatment policy implementation. To ensure successful policy implementation, stakeholders need to receive training on new policies and to ensure the availability of supplies of material resources, inclusive decision-making, supportive monitoring of policy implementation, and oversight.

The study reported in **Chapter 5** of this dissertation presents a six-month prospective facility-based study involving 750 PLWH in the Bono and Bono East regions of Ghana. Among the entire sample, multiple linear regression analysis was used to identify psychosocial factors associated with ART adherence intention and behavior. The study found that perceived behavioral control, self-regulation, outcome expectancy, resilience, and age 55 years and above predicted the intention to adhere to ART. Only self-regulation emerged as a strong predictor of ART adherence. PLWH adherence intentions and behaviors can be improved through modeling and persuasive communication.

Chapter 6 summarizes and discusses the major findings of the five studies in the context of the antiretroviral adherence literature. This chapter includes reflections on the research approaches, implications for antiretroviral treatment interventions, recommendations for practice and future research, and concluding remarks of this dissertation.

Acknowledgement

To God be the Glory, for the great things He has done and for the greater things He will do. My deepest gratitude goes to all promoters and co-promoters Prof. dr. R.A.C. Ruiter, Prof. dr. A.E.R. Bos, Open Universiteit, Dr. F.E.F Mevissen, GGD Rotterdam – Rijnmond, Dr. Kwaku Poku Asante, Kintampo Health Centre, RDD, GHS, Ghana for their immense support throughout this journey. Their prompt and invaluable feedback, eye for excellence and detail shaped my work and the completion of my thesis. To Prof. Bos, Prof Ruiter and Dr. Mevissen, I am extremely grateful for the social periods we had together in dinners, lunches, visits to parks, museums and your homes. These were very important "cool off" moments for me.

I appreciate Dr. John Kingsley Krugu for his inspiration and assistance to start this PHD at Maastricht University.

I am extremely grateful to Prof. Seth Owusu-Agyei for his support and for being my pillar throughout my career as a researcher and contributions to my life, this PhD journey and scholarly articles in this thesis. Onyame nhyira wo pii.

Worthy of mention are Professors Frank Baiden and Sam Kofi Newton who mentored me among others to win my first grant, write my first papers for publication, research implementation, leadership and communicating scientific research.

I am highly indebted to NUFFIC for funding the study under the Ph.D. fellowship grant nr. NFP-Ph. D. 170007, Maastricht University, and Kintampo Health Research Centre for providing additional support. I am thankful to the secretariat of Maastricht University Department of Work and Social Psychology, especially to Mariella Muermans of Maastricht University for their immense support throughout my study in the Netherlands. Mariella, you have the "magic wand" that makes difficult look easy, thank you.

I wish to thank all study participants who consented to participate in this study, and to the management of all the participating health facilities.

To the Director, management, staff and secretariat of Kintampo Health Research Centre, Research and Development Division, Ghana Health Service, I say thank you for your support during the period of my study. To Dr. Samuel Afari-Asiedu, Kwame Kesse Adjei, Solomon Nyame and all my friends and colleagues, thank you for your support.

Finally, my profound and special thanks goes to my dearest husband, Frank Nana Kwame Danso, Nana Gyan Fosu, I could not have made it without your support. You were there

through my highs and lows, you shared in all the emotions and for your words of encouragement that kept telling me ‘you can do this’, I appreciate you every day and I love you, Honey! I wish to thank my parents who have been there for me and sacrificed a lot to give me education and for their continuous support, I say may God continue to richly bless you. To my children Mary, Emmanuel and Manuel and to my siblings and family thank you for all the support, love and well wishes.

Authors resume

Martha Ali Abdulai was born on November 11, 1984. She pursued BSc community nutrition at the University for Development Studies, where she received a Bachelor of Science degree. Martha served her mandatory national service with the Kintampo Health Research Center, where she has worked in various ranks till date. She started her research career in 2008 at the Kintampo Health Research Center (KHRC), Ghana Health Service (GHS). In 2010, she was among the few who won the director's small grants initiative as the principal investigator on “microbicide acceptability among pregnant women in Ghana,” which she successfully completed and published as the lead author. In pursuance of her education, The Royal Tropical Institute (KIT), Netherlands, admitted Martha with a scholarship from NUFFIC and KHRC, where she successfully completed a master's in public health (HIV specialization). She has since managed several research projects successfully at the KHRC, GHS. This includes environmental health research, family health research, communicable and non-communicable disease research and health policy and program evaluation research in Ghana. In collaboration with the Royal Tropical Institute, The Netherlands, Martha co-organized a Nuffic-sponsored refresher course in community-based approaches to health in Kintampo, Ghana. She has also participated in career development trainings, including Nuffic-sponsored postgraduate refresher course on non-communicable diseases in Lusaka, Zambia, and a Brown Institute- sponsored postgraduate short course on 35 years of advances in HIV in Rhode Island, USA. In 2017, she started her Ph.D. program at Maastricht University with financial support from NUFFIC, UM, and KHRC. She has taken part in several national conferences on HIV/AIDS. She has a strong interest in sexual and reproductive health, including HIV and its associated comorbidities.

Publications

Included in dissertation

Abdulai, M. A., Mevissen, F. E., Ruiter, R. A.C., Owusu-Agyei, S., Asante, K. P., & Bos, A. E. (2022). A qualitative analysis of factors influencing antiretroviral adherence among persons living with HIV in Ghana. *Journal of Community & Applied Social Psychology*, *32*(1), 135-150.

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Not included in dissertation

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