Antiretroviral Treatment (ART) Recipients' Knowledge, Attitudes, Beliefs and Treatment Outcome Nexus

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Abstract

In this study the relationship between treatment outcomes and antiretroviral treatment (ART) recipients' knowledge, attitudes and beliefs towards HIV/AIDS was analysed. The study employed the positivist paradigm, guided by the Health Belief Model in explaining the intricate relationship between disease, sick-role behaviour and the expected outcome of treatment. The target population comprised ART recipients at Mthatha, South Africa. This study made use of a purposive sample of 112 participants, inclusive of male and female adult recipients. The respondents in this study raised a number of positive and negative issues. The results of the study revealed a significant relationship between ART recipients' knowledge of HIV/AIDS treatment, their view that taking HIV drugs is a waste of time, and the recipients' results of HIV/AIDS treatment. This implies that a significant difference exists between those who have a better CD4, the same CD4, and a worse CD4, based on their knowledge about taking ARVs. The study did not establish a significant relationship between treatment outcomes and some variables of recipients' attitudes towards HIV/AIDS, which means there is no difference between the recipients based on all the attitude variables. While a significant difference exists among recipients of different treatment outcomes (CD4 counts), based on their belief that "Having HIV is a death sentence," no significant difference was found among recipients of different CD4 counts based on their beliefs, such as: whether HIV treatment prolongs life; if a traditional healer can heal HIV; if prayer can heal HIV; that HIV has serious consequences on health; and that practising preventive actions can reduce HIV transmission.

Keywords: HIV/AIDS; antiretroviral treatment (ART); outcomes; beliefs; patients

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Introduction

Presently in South Africa, HIV/AIDS is a huge health problem, where the world statistics tend to suggest that it is among those countries with a very high proportion of people living with HIV/AIDS. South Africa accounts for a third of all new HIV infections in southern Africa (Avert 2020; UNAIDS 2017). In 2018, there were 240 000 new HIV infections and 71 000 South Africans died from AIDS-related illnesses (Avert 2020; UNAIDS 2019a). "The Eastern Cape province of South Africa has one of the highest burdens of HIV in the world" (Hansoti et al. 2019, 14). In recognition of the above, the South African government has in the last decade rolled out antiretroviral treatment (ART). This has been largely financed from its own domestic resources. In 2017, the country invested more than $1.54 billion annually to run its HIV programmes (UNAIDS 2019b). The success of South Africa's ART programme is evident in the increase in national life expectancy from 56 years in 2010 to 63 years in 2018 (Avert 2020; World Bank 2019). For some time, the South African government has achieved higher target levels through task shifting, which entails the reallocation of tasks among available staff and professionals (Boatman et al 2019; Van Damme, Kober, and Kegels 2008). The South African government's effort in reaching a large population spectrum with ART, owes its success to the grassroots-based methods and systems employed by the Health Department. This is similar to the approach of the neighbouring country, Lesotho, where HIV/AIDS treatment is integrated into the Primary Health Care (PHC) delivery (Nyangu and Nkosi 2019; Nyaphisi and Obioha 2015; Obioha and Molale 2011; Odeny et al. 2013). Interestingly, Namibia has recorded remarkable success in ART and is on track to achieve UNAIDS 90-90-90 targets by 2020 with its "treat all" campaign, where "76.7% of people [are] living with HIV on ART, 87% of those on ART [are] virally suppressed" and "HIV incidence [has] declined by 21% since 2010" (Agolory et al. 2018, 1).

For long-term effectiveness, the potency of ART depends on maximum and even durable suppression of viral load and replication in the body. Similarly, the success of ART depends on early diagnosis and appropriate ART, which must include an increased level of viral suppression, toxicities management, and adherence to treatment (Nyangu and Nkosi 2019, 2). Some studies of large-scale coverage in selected countries in Africa have demonstrated that patients are really faithful to ART (Agolory et al. 2018; Pillai et al. 2019; UNAIDS 2000). Other studies, focusing on the views of role players and recipients of ART such as Chiegil, Zungu, and Jooste (2014), revealed how the recipients were satisfied with a number of services that they received from the care givers, especially, home-based carers (Obioha and Nyaphisi 2018). These include both drug supplies and intangible services in terms of counselling and support group integration. Kredo, McCaul, and Volmink (2015) also found that the role played by adequately trained and supported nurses (or other community health workers) through shifting responsibility for providing ART, was a factor in the decrease of patients lost to follow-up.

Adherence to antiretroviral treatment (ART) has been largely problematic, as many factors such as beliefs and attitudes of people (living with or affected by HIV/AIDS) may contribute to a violation of a treatment regimen, especially in low income, undeveloped societies. Patel et al. (2012), Tabatabai et al. (2014), Nyangu and Nkosi (2019) have documented various reasons for patients' dissatisfaction and violation of ART regimes in southern African countries. These range from personal, logistical, drug interactions, and healthcare provider reasons, among others. In order to minimise the multiplicity and interconnected effects of HIV/AIDS (which include loss of income and stigma, among others), the right attitude is a necessity (UNAIDS 2013). This is because the right attitude and behaviour would positively influence the treatment outcome. However, the extent to which human attributes such as knowledge, attitudes and belief influence the treatment outcome, is not certain. Therefore, this study set out to investigate how these attributes may influence or are associated with treatment outcomes of ART recipients in Mthatha, Eastern Cape of South Africa. The main question is: What is the relationship between ART recipients' treatment outcomes and the recipients' HIV/AIDS knowledge, attitudes and beliefs? Delving into this question is important, especially in the province of Eastern Cape, which has the third highest burden of HIV in South Africa (2017 National HIV Prevalence, HSRC 2018). The Eastern Cape has witnessed the highest rise in HIV prevalence in the country over the preceding five years, with a disproportionately high burden relative to the resources allocated to the region (Hansoti et al. 2019).

Research Objectives

The main objective of this study was to ascertain whether ART recipients' HIV/AIDS knowledge, attitudes and beliefs have an influence on recipients' treatment outcomes. Based on the main objective, the specific objectives followed in this study included:

1. To assess the general knowledge of HIV patients attending an infectious disease clinic about HIV/AIDS.

2. To investigate the attitudes of the patients towards HIV/AIDS.

3. To investigate the beliefs the patients have about HIV/AIDS.

4. To ascertain the HIV treatment outcomes among the patients.

5. To analyse the relationship between the treatment outcomes and the patients' knowledge, attitudes and beliefs towards HIV/AIDS.

Theoretical Framework: Health Belief Model

This study was foregrounded in the epistemologically positivist paradigm, which assumes that in order to understand humans, knowledge and reality are viewed as objective (Al-Saadi 2014). In consonance with the foregoing, this study utilised the Health Belief Model in explaining the subject of this research. Health belief is used to explain and predict health-related behaviour from certain belief patterns (Ajzen 1991).

It addresses susceptibility and severity, in terms of an individual's thinking about the dangers a particular health problem poses, and the barriers, cues to action and self-efficacy (Cotrell et al. 2017). In the presence of perceived threats, the model emphasises a balance between fear and a sense of self efficacy if action is to occur. The feeling of threat by an individual's current behaviour patterns, and a further threat thereof, have to be recognised by individuals as important if behaviour change is aimed to succeed. The Health Belief Model further assumes that an individual's preparedness to affect an action about his or her problem is a function of his or her understanding of their susceptibility to the disease, coupled with the perceived severity in the near time and the presence of a method to avert the disease effectively. Furthermore, the sick must come to terms with the reality that his or her health is in serious jeopardy. More importantly, for a disease like HIV/AID, which does not usually show symptoms, the individual must understand that he or she can contract the disease without experiencing any symptoms. Time lost from work, pain and or discomfort must be used to gauge the extent to which the disease is serious and severe. On the other hand, an individual has to see a benefit as the outcome of an alteration in behaviour, which may have an acceptable cost. In most cases, an individual must be convinced that the benefit emanating from a particular behaviour change will surpass the cost. The individual has to see that such benefits are actually feasible and within reach of the individual, while accessing the circumstances surrounding the Health Belief Model. The model also extensively dwells on self-efficacy, which relates to individual competency to engage in the behaviour required to determine anticipated results. In this case, an individual must ascertain his or her ability to deal with obstacles to engage in a particular direction of action.

The Health Belief Model and its assumptions and principles, therefore, explore how individuals perceive the severity of a disease, for instance HIV/AIDS. It is expected that ART recipients need to be somewhat worried by how they currently behave, which puts their health in jeopardy. They must also feel their ability to deal with anticipated obstacles by taking appropriate action. Ultimately, a change from unhealthy behaviours to healthy ones will eventually lead to a positive treatment outcome.

Research Hypotheses

Hypothesis 1: There is a significant relationship between ART recipients' all knowledge variables on HIV/AIDS and recipients' results of HIV/AIDS treatment outcomes.

Hypothesis 2: There is a significant relationship between ART recipients' all attitude variables towards HIV/AIDS and treatment outcomes

Hypothesis 3: There is a significant relationship between ART recipients' all belief variables on HIV/AIDS and treatment outcomes.

Materials and Method

The study was conducted among selected out-patient ART recipients attending an infectious disease clinic (IDC) in Mthatha, Eastern Cape of South Africa. This excluded those living with HIV/AIDS who were not attending clinics for their treatment. The out-patient ART recipients were chosen on the basis of convenience and accessibility. Having targeted the ART recipients, a sample of 112 respondents was randomly reached outside the clinic as patients arrived, until the required manageable number was reached. The sample size was not strictly determined by a known sample frame or list of ART recipients attending the IDC, as the universe was not known and was not indispensable in determining the sample. Instead, the sample size was determined by the manageability and the principle of a minimum sample threshold in terms of the number of respondents required for an acceptable statistical analysis (Garg 2016, 85). However, no sample frame was required from the clinic as the researcher wanted the ART recipients to participate on their own volition to avoid any influence by the clinic.

As a cross-sectional study, it adopted a quantitative approach, in which a survey instrument (questionnaire) was utilised for the purpose of obtaining data from the ART recipients. This approach was used in order to bring results with less human interaction for the purpose of confidentiality and anonymity. This approach also made it possible to standardise responses and the data harvested from the survey. The survey instrument (questionnaire) comprised different sections measuring knowledge, attitudes and beliefs of ART recipients, and their treatment outcomes. While the ART recipients' knowledge, attitudes and beliefs constituted the Independent Variables (IV), the Treatment Outcome (TO) proxy by the CD4 count served as the Dependent Variable (DV), which this research sought to explain. The face validity of the research instrument was obtained after thorough scrutiny by experts in the field, followed by a pilot study that tested the content as well as construct validity. Data generated from the survey were analysed by using appropriate tools from the Statistical Package for the Social Sciences (SPSS). Specifically, Kruskal Wallis Chi-Square Test of difference was used to verify the three research hypotheses of this study. The following Chi-Square Equation Estimation Formula was used:

$$\chi_c^2 = \sum \frac{(O_i - E_i)^2}{E_i}$$

where O is the observed value, E is the expected value, and i is the "ith" position in the contingency table.

Ethical Consideration

This manuscript was derived from a postgraduate research paper. Permission for the study was verbally granted to the researcher by the authorities of the infectious disease clinic (IDC) at Gateway Clinic Mthatha, on condition that the researcher dealt with the respondents in their personal capacity as adults receiving ART from the clinic and their

confidentiality would be observed. The researcher did not, therefore, require any clinical information from the clinic about the target group. In compliance with the above condition, the researcher collected a letter of introduction from the academic department for the purpose of this research, which was made available to relevant persons and ART recipients before data collection commenced. All ethical considerations, including consent negotiation, were observed before and during the process of collecting relevant data from the respondents, who voluntarily participated in the study with full assurance of confidentiality and anonymity. Importantly, this study was not conducted as institutional-based research, as the respondents were not tracked directly from clinic's records; rather every respondent was approached in their capacity as adults and as a detached outpatient individual outside the control of the clinic. Hence a confidentiality and anonymity agreement was reached only between the researcher and the respondents through the signing of a consent document, without the intermediation of the clinic's authorities.

Data Analysis and Results

General Knowledge of ART Recipients about HIV/AIDS

The results of antiretroviral treatment (ART) recipients' knowledge about HIV/AIDS are indicated in table 1. The study revealed that the majority of the recipients knew of the existence of HIV/AIDS as a disease. They were also aware of various ways that HIV is transmitted, through clinic talks, as well as through printed and electronic media. Although just over half of the respondents knew that HIV is not curable, many recipients were still not aware, which points to more public enlightenment in this regard. Unprotected sex, which means having sex without a condom, was believed to be a risky activity. How HIV/AIDS is transmitted from one person to another was not yet known, or they were not sure, as expressed by a few ART recipients, while proportionally, quite a huge majority were well informed about the modalities of transmission. The research revealed an overwhelming knowledge on the interface between sexually transmitted diseases and the influence of these diseases in increasing the chances of contracting HIV/AIDS. Also, the fact that HIV/AIDS may be an asymptomatic health condition, which cannot be read on the face of anyone, was known by a majority of the recipients. While some recipients still did not know that HIV/AIDS can be transmitted from mother to child during birth, a majority were aware of this risk. The views of a majority of the respondents receiving ART were: HIV is not the same as AIDS; HIV is not caused by poverty; or by cold weather; or by being bewitched; or by mosquito bites. A majority of the ART recipients, who responded to the questionnaire in this study, were convinced that their treatment by taking drugs would not be a waste of time.

Table 1: Responses on general knowledge of HIV/AIDS among the ART recipients

Item	$\bar{x}$	σ_X	σ^2	df	χ^2	Sig
HIV/AIDS awareness	2.83	0.48	0.23	2	148.089	0.00
How HIV is transmitted	2.88	0.39	0.15	2	168.323	0.00
HIV is a disease with no cure	2.33	0.85	0.73	2	34.357	0.00
Unprotected sex leads to HIV	2.92	0.34	0.12	2	195.081	0.00
HIV is transmitted through piercing instruments	2.72	0.64	0.41	2	124.839	0.00
STDs increase the chance of HIV	2.84	0.40	0.16	2	144.661	0.00
Recognise HIV+ person by appearance	1.50	0.83	0.70	2	81.446	0.00
Mother-to-child transmission	2.50	0.80	0.64	2	67.786	0.00
HIV+ is not AIDS	2.63	0.73	0.54	2	102.703	0.00
HIV is not caused by poverty, mosquitoes, etc.	2.47	0.56	0.32	2	45.125	0.00
Taking HIV drugs is a waste of time	1.40	0.77	0.60	2	102.125	0.00

Key on Response Scale: No = 1; Not Sure = 2; Yes = 3.
Therefore, the higher the mean score the more positive the response.

From all the indicators, the knowledge that unprotected sex leads to HIV is the most prominent, followed by how HIV is transmitted. On the other hand, the respondents least understood that HIV/AIDS patients may not be recognised by appearance, when compared with their knowledge on other issues. The Chi-square Test of difference revealed that respondents differed significantly in most of the general knowledge variables about HIV/AIDS at P=<0.001 level. More respondents in each variable understood the basic knowledge of HIV/AIDs as a disease that could be classified as healthy, than those on the contrary. Above all, their knowledge that unprotected sex leads to HIV surpassed others.

ART Recipients' Attitudes to HIV/AIDS

The way someone feels about someone or something, including diseases, can be regarded as one's attitude, which directly or indirectly has an influence on choices that individuals make, actions they take, and their responses to life challenges. The ART recipients' attitudes in this study refer to the behaviour and feelings they had for other HIV positive people and HIV itself as a disease. Table 2 contains responses regarding ART recipients' attitude.

Table 2: Responses on attitudes of ART recipients towards HIV/AIDS

Item	$\bar{x}$	σx	σ²	df	χ2	Sig
Kissing an HIV+ person	2.59	0.73	0.53	2	82.216	0.00
Using same bathing facility with HIV+	2.60	0.73	0.54	2	91.946	0.00
Negative reaction towards HIV friends	1.23	0.61	0.37	2	143.696	0.00
Shaking hands with HIV+ person	2.76	0.60	0.36	2	138.500	0.00
Association with HIV friends/family	2.88	0.41	0.17	2	173.268	0.00
Receiving treatment is shameful	1.16	0.51	0.26	2	162.982	0.00
Taking medication forever is boring	1.54	0.86	0.75	2	76.839	0.00
Using condoms when HIV+ is not necessary	2.12	0.97	0.95	2	47.268	0.00

Key on Response Scale: No = 1; Not Sure = 2; Yes = 3.
Therefore, the higher the mean score the more positive the response.

The result shows that a minority of the respondents had a discriminatory attitude, which is regrettable, while on the other hand, a majority upheld no boundaries when "romantically kissing" infected people, which could signal a dangerous trend. A majority of the respondents did not have negative reactions toward HIV+ friends; they believed that they could use the same bathing facility with an infected person, shake hands, and associate with HIV friends/family. A minority of the respondents were of the inclination that receiving treatment was shameful and also that taking medication was boring, while a majority of respondents believed that using a condom (even when HIV+) was not necessary. Inferentially, the Chi-square Test of difference revealed that respondents differed significantly in all of the attitude variables about HIV/AIDS at P=<0.001 level. More respondents in more variables understood the basic knowledge that could be classified as healthy, than those on the contrary.

Beliefs of ART Recipients towards HIV/AIDS

Trust, confidence and faith in something or someone are collectively regarded as a belief that someone holds (Kalichman et al. 2016). ART recipients in this study had some specific beliefs surrounding HIV/AIDS. The respondents' beliefs about HIV/AIDS are captured in table 3. A majority of the respondents were inclined that HIV treatment can prolong life; they confirmed that traditional healers could not heal HIV/AIDS; they did not believe that prayer can heal an HIV/AIDS person; and they believed that HIV/AIDS did not automatically lead to death. A majority also knew that the vulnerability of HIV infection is high. Awareness about the serious consequences of contracting HIV/AIDS on a person's health, coupled with practising preventive actions to reduce HIV transmission or its severity when already contracted, received a majority response. A few people said that they did not know. Generally, the perception of vulnerability to HIV was confirmed to be high by a majority of the respondents at 65.2%.

Table 3: Responses on beliefs of ART recipients on HIV/AIDS

Item						
	$\bar{x}$	σ_X	σ^2	df	$\chi 2$	Sig
ARVs can prolong life	2.70	0.63	0.40	2	111.446	0.00
Traditional healer heals HIV/AIDS	1.22	0.56	0.31	2	133.625	0.00
Prayer heals HIV	1.52	0.79	0.63	2	54.232	0.00
Having HIV is a death sentence	1.19	0.56	0.32	2	153.125	0.00
HIV has consequences on health	1.45	0.68	0.46	2	54.125	0.00
Preventive actions can reduce HIV transmission	2.41	0.85	0.73	2	54.125	0.00
Perception of vulnerability of HIV	2.57	0.73	0.53	2	73.143	0.00

Key on Response Scale: No = 1; Not Sure = 2; Yes = 3.
Therefore, the higher the Mean Score the more positive the response.

The Chi-square Test of difference revealed that respondents differed significantly in most general knowledge variables about HIV/AIDS at $P=<0.001$ level. More respondents in each variable understood the basic knowledge that can be classified as healthy, than those on the contrary.

Perceived and Actual Treatment Outcomes of ART on the Recipients

An outcome means a result, a new condition or event occurring in an individual, which is used to access efficacy. The perceived or the actual treatment outcomes of ART recipients are the results of their new condition, depicted by the CD4 count after following the procedures of taking their medications. The results from their last clinical tests, as presented in table 4, show that a majority of respondents 82.6% agreed that the results of the last test about their HIV status (CD4 count) were better, whereas 11% of the respondents saw that their CD4 count was worse, and 6.4% said their CD count had remained the same.

Table 4: Last Result of HIV Test/Actual treatment outcome of ART recipients

What was the result of the last test about your HIV status?	N	%
Worse CD4 count	12	11.0
Same CD4 count as before	7	6.4
Better CD4 count	90	82.6
Total	109	100

The link between the participants' responses on their CD4 count and their knowledge, attitudes and beliefs was tested in the following hypotheses to establish whether the relationships were significant.

Hypotheses Testing

Hypothesis Test 1:

There is a significant relationship between recipients' all knowledge variables and ART recipients' results of HIV/AIDS treatment outcomes.

This hypothesis is partially supported. Table 5 contains the results of the test of the hypothesis on the relationship between ART recipients' knowledge variable and treatment outcomes. It reveals a significant difference between those who have a better CD4, the same CD4, and a worse CD4 based on their knowledge about taking ARVs; although the test shows no significant differences in the rest of knowledge variables studied.

Table 5: Results of test of hypotheses on the relationship between ART recipients' knowledge variables on HIV/AIDS and treatment outcomes

Knowledge Variables	Last result of HIV Test/Outcome	N	x̄	df	χ2	Sig
Aware of the existence of HIV/AIDS	Worse CD4 count	12	57.08			
	Same CD4 count	7	54.57			
	Better CD4 count	90	54.76			
	Total	109		2	0.174	0.91
How HIV is transmitted	Worse CD4 count	12	55.17			
	Same CD4 count	7	52.43			
	Better CD4 count	90	55.18			
	Total	109		2	0.198	0.90
HIV is a disease without a cure	Worse CD4 count	12	51.04			
	Same CD4 count	7	62.57			
	Better CD4 count	90	54.94			
	Total	109		2	0.759	0.68
Sex with an infected partner without condom leads to HIV	Worse CD4 count	12	57.50			
	Same CD4 count	7	49.57			
	Better CD4 count	90	55.09			
	Total	109		2	2.148	0.34
Sharing instruments with blood can spread HIV and AIDS	Worse CD4 count	12	44.88			
	Same CD4 count	7	63.50			
	Better CD4 count	90	55.69			
	Total	109		2	4.476	0.10
STDs increase the probability of HIV transmission	Worse CD4 count	12	57.50			
	Same CD4 count	7	54.29			
	Better CD4 count	90	54.72			
	Total	109		2	0.255	0.88
Telling by appearance that someone is HIV	Worse CD4 count	12	62.17			
	Same CD4 count	7	53.71			
	Better CD4 count	90	54.14			
	Total	109		2	1.117	0.57
HIV can be transmitted from HIV mother-to-child during child birth	Worse CD4 count	12	63.58			
	Same CD4 count	7	71.00			
	Better CD4 count	90	52.61			
	Total	109		2	4.988	0.08
Being HIV+ does not mean having AIDS	Worse CD4 count	12	52.58			
	Same CD4 count	7	51.21			
	Better CD4 count	89	55.02			
	Total	108		2	0.287	0.86
HIV is caused by poverty, a virus, mosquitoes, being bewitched	Worse CD4 count	12	55.75			
	Same CD4 count	7	40.64			
	Better CD4 count	90	56.02			
	Total	109		2	1.992	0.36
Taking HIV drugs is a waste of time	Worse CD4 count	12	66.75			
	Same CD4 count	7	82.00			
	Better CD4 count	90	51.33			
	Total	109		2	18.326	0.00

Key:

CD4 count: Is a test that measures the number of CD4 cells in your blood. CD4 cells, also known as T cells, are white blood cells that fight infection and play an important role in your immune system.

Worse CD4 count: It is when the number of CD4 cells of a person decreases as HIV disease gets worse.

Same CD4 count: It is when the number of CD4 cells of a person remains the same.

Better CD4 count: It is when the number of CD4 cells of a person is higher than before.

Hypothesis Test 2:

There is a significant relationship between ART recipients' all attitude variables towards HIV/AIDS and treatment outcomes.

This hypothesis is rejected. The outcome of the Kruskal Wallis test of the hypothesis (table 6) on the relationship between ART recipients' attitudes towards HIV/AIDS and treatment outcomes shows that no significant relationship exists between ART recipients' all attitude variables towards HIV/AIDS and treatment outcomes. This means there is no difference between the respondents based on all the attitudes variables.

Table 6: Results of test of hypothesis on the relationship between ART recipients' attitude variables towards HIV/AIDS and treatment outcomes

Attitude Variables	Last result of HIV Test/Outcome	N	x̄	df	χ2	Sig
Kiss an HIV/AIDS infected person	Worse CD4 count	12	55.83			
	Same CD4 count	7	51.36			
	Better CD4 count	89	54.57			
	Total	108		2	0.157	0.92
Sharing the same eating and bathing facilities with HIV+ people	Worse CD4 count	12	41.00			
	Same CD4 count	7	60.00			
	Better CD4 count	90	56.48			
	Total	109		2	4.784	0.09
Negative reaction when your friends are HIV	Worse CD4 count	12	56.29			
	Same CD4 count	7	55.57			
	Better CD4 count	90	54.78			
	Total	109		2	0.074	0.96
Shaking hands and drinking tea with an infected person	Worse CD4 count	12	48.63			
	Same CD4 count	7	54.79			
	Better CD4 count	90	55.87			
	Total	109		2	1.471	0.47
Association with HIV family and friends	Worse CD4 count	12	59.50			
	Same CD4 count	7	59.50			
	Better CD4 count	90	54.05			
	Total	109		2	2.048	0.35
Receiving HIV treatment is shameful	Worse CD4 count	12	58.92			
	Same CD4 count	7	64.86			
	Better CD4 count	90	53.71			
	Total	109		2	3.717	0.15
Taking medication for the rest of your life is boring	Worse CD4 count	12	51.92			
	Same CD4 count	7	71.57			
	Better CD4 count	90	54.12			
	Total	109		2	3.333	0.18
Using condoms when infected is not necessary	Worse CD4 count	12	61.67			
	Same CD4 count	7	48.21			
	Better CD4 count	90	54.64			
	Total	109		2	1.129	0.56

Hypothesis Test 3

There is a significant relationship between ART recipients' all beliefs variables on HIV/AIDS and treatment outcomes.

This hypothesis is partially supported. The results of the Kruskal Wallis test of the hypothesis (table 7) show that no significant difference was found among ART recipients of different CD4 counts based on their responses on whether HIV treatment prolongs life; if traditional healers can heal HIV; if prayer can heal HIV; of HIV having serious consequences on health; and if practising preventive actions can reduce HIV transmission. However, a significant relationship was found between one of the belief

variables "Having HIV is a death sentence" and the treatment outcomes. A large number of ART recipients of different CD4 counts disagreed that having HIV is a death sentence, meaning that they are all aware that having HIV is not the end of the world.

Table 7: Results of the test of hypothesis on the relationship between ART recipients' beliefs variables on HIV/AIDS and treatment outcomes

Beliefs Variables	Last result of HIV Test/Outcomes	N	x̄	df	χ2	Sig
HIV treatment can prolong the life of an individual	Worse CD4 count	12	65.50			
	Same CD4 count	7	65.50			
	Better CD4 count	90	52.78			
	Total	109		2	5.379	0.06
A traditional healer can heal HIV/AIDS	Worse CD4 count	12	60.42			
	Same CD4 count	7	55.43			
	Better CD4 count	90	54.24			
	Total	109		2	1.071	0.58
Prayer can heal from HIV	Worse CD4 count	12	53.25			
	Same CD4 count	7	46.50			
	Better CD4 count	90	55.89			
	Total	109		2	0.906	0.63
Having HIV/AIDS is a death sentence	Worse CD4 count	12	71.50			
	Same CD4 count	7	64.64			
	Better CD4 count	90	52.05			
	Total	109		2	14.478	0.00
Perception of the vulnerability of HIV infection	Worse CD4 count	12	49.25			
	Same CD4 count	7	68.79			
	Better CD4 count	90	54.69			
	Total	109		2	2.417	0.29
HIV can have consequences on someone's health	Worse CD4 count	12	57.00			
	Same CD4 count	7	56.71			
	Better CD4 count	90	54.60			
	Total	109		2	0.117	0.94
Preventive actions can reduce HIV transmission	Worse CD4 count	12	51.50			
	Same CD4 count	7	51.07			
	Better CD4 count	90	55.77			
	Total	109		2	0.482	0.78

Discussion of Findings

The present study reveals mixed results with regard to knowledge, attitudes and beliefs of the ART recipients towards HIV/AIDS. While a majority of the participants responded that they were properly informed about the disease and how it is transmitted, among others, a number of the respondents still lacked the appropriate knowledge about HIV/AIDS. This concerns the persistence of HIV, especially the rate of new infections of about 240 000 (UNAIDS 2020) and its seriousness, as HIV prevalence remains high, with 20.4% of people living with HIV (Avert 2020; UNAIDS 2020). However, the prevalence of HIV/AIDS varies markedly between regions, ranging from 12.6% in the Western Cape to 27% in KwaZulu-Natal, as previously observed by HSRC (2018).

Similarly, the results of their responses on attitudes and beliefs did not depict a wholesome positive and satisfactory attitude and belief towards the disease, as some participants still discriminated against HIV positive people in the community. Following the above observations, it is evident that much still needs to be done to educate the public on issues of HIV/AIDS, through public education and awareness mediums.

There is usually an acceptance that most people, if not all citizens of South Africa, especially Eastern Cape residents, are adequately informed about HIV/AIDS. This presumption arises from the fact that the disease has been with our society for a couple of decades. There may be hardly any member of the country or resident of Mthatha who has not seen or heard of either a friend, family member or a neighbour who is infected by HIV, or who has died of AIDS in the past or in recent time. There is no denial that HIV/AIDs has been a reality, where people are either infected or affected by the disease. However, the reality is that most people may be living in denial and not necessarily ignorance. This raises a concern regarding the dangers for vulnerable and susceptible citizens, as enunciated in Ajzen's (1991), Health Belief Model, Rehan et al. (2016), and recently Aldohaian, Alshammari, and Arafah (2019) in their study on using the Health Belief Model to assess beliefs and behaviours regarding cervical cancer screening among Saudi women. It, therefore, means that those whose responses fall short of the expected knowledge, attitudes and beliefs towards HIV, seem to be numb without perceiving the threat of HIV/AIDS to them and their families, in spite of some episodes within their life experience.

Understanding people's knowledge, attitudes and beliefs towards HIV/AID has not yielded much scientific insight into how such knowledge translates into positive outcomes in the lives of the patients undergoing antiretroviral treatment in the Eastern Cape. The assumption is that due to the severity of HIV/AIDS and the difficult experience some people have had with it, there is a likelihood that such concern would positively influence people living with HIV in strictly adhering to their HIV treatment regimen. The reality is that ART recipients' positive outcome in terms of treatment is a function of a multiplicity of actions and interactions among different conditions. This is further explained by Cotrell et al. (2017), who clearly identified and distinguished various perceived conditions as they relate to individual health. As treatment is a balance of options geared towards a particular benefit—healing—the major concern for the respondents was how they perceived the available treatment and whether they considered it relevant, which may influence their behaviour. In this regard, the patients would have had to perceive ART as worthwhile before they would adhere to it, considering the discomforts associated with the treatment regimen.

The test about ART recipients' knowledge and ART recipients' result of HIV/AIDS treatment outcomes, revealed that there was a significant difference between those who have a better CD4, the same CD4, and a worse CD4, based on their knowledge about taking ARV. More of those that have a better CD4 count believed in taking HIV drugs,

which according to them was not a waste of time. However, the majority of respondents who had the same CD4 count as before were not aware of whether taking drugs could prolong their lives. In this regard, there is a need for public education for all ART recipients. The test also showed no significant differences in the responses of recipients according to their last results of HIV status regarding the rest of the knowledge variables studied. The majority of respondents from all statuses agreed that they knew about HIV/AIDS. This is an indication that the awareness programmes on television, radio, posters and in the clinics do reach people and inform them about the existence of the disease. The majority of respondents from all statuses agreed that they knew how HIV was transmitted. Most respondents agreed that having sex with a partner who is HIV+ could lead to HIV infection, if a condom is not used. For them, sexually transmitted diseases increase the chances of HIV infection.

This study discovered that many respondents were aware of the existence of HIV/AIDS and they knew the mode of transmission of the disease. The present finding is in consonance with Hongbin (2005) and Xinming (2003), whose studies demonstrated that the majority of people had a moderate level of HIV knowledge because the newspapers, posters and magazines were the most common ways for them to receive information about HIV. Greater exposure to HIV mass communication programmes was found to be associated with greater HIV knowledge, condom use at last sex, having tested for HIV in the past 12 months, and a less stigmatising attitude toward PLWHA (Peltzer 2012). We can conclude that many people do have knowledge on HIV and AIDS through social media like internet, television, radio, posters, magazines and newspapers. In a more recent study, Chin and Mansori (2019) found that perceived benefits and knowledge have the biggest influence on disease screening intention. Therefore, people seek information and access various mass media because of the benefit that they will derive from having such knowledge, in terms of HIV/AID disease prevention and care.

The test of hypothesis on the relationship between ART recipients' attitude variables towards HIV/AIDS and treatment outcomes shows that there is no relationship between any variables on ART recipients' attitudes towards HIV/AIDS and treatment outcomes. This means there is no difference between the respondents based on all the attitudes variables. The overall percentage distribution in the test shows that the majority of respondents agreed that they would kiss even an HIV+ person. However, the problem is that they may not be able to distinguish between different levels of kissing, in which case a "passionate kiss" may be dangerous. Given that the level of kissing was not measured in this present study, it may be inaccurate to conclude whether other people may be discouraged from kissing an HIV positive person because of fear of virus transmission. This raises a contention on whether kissing a mouth with bleeding gums or broken lips has no potential risk in the transmission of HIV, when compared with mouths that are free of bleeding of any sort. The majority of respondents agreed that it is proper for people, including those who are living with HIV/AIDS to eat from the same plate, or to bath in the same facility with uninfected folks. They were aware that HIV could not be contracted by sharing the same eating and bathing facilities with an

HIV+ person. The majority of respondents agreed that they would shake hands, and drink tea in the same cup used by a person infected with HIV/AIDS, which also shows their level of belief that shaking hands, or drinking tea from the same cup with an infected person cannot transmit the disease.

Results of the test of hypothesis on the relationship between ART recipients' belief variables on HIV/AIDS and treatment outcomes indicate that no significant difference was found among patients of different CD4 counts based on their responses on whether HIV treatment prolongs life, if a traditional healer can heal HIV, if prayer can heal HIV, that HIV has serious consequences on health, and that practising preventive actions can reduce HIV transmission. However, there is a significant relationship between the variable "Having HIV is a death sentence" and the treatment outcomes. A large number of patients of different CD4 counts disagreed that having HIV is a death sentence, meaning that they were all aware that having HIV is not the end of the world.

The majority of respondents did not have any doubt about the potency of HIV/AID treatment in prolonging the life of an individual who is HIV+. In the same vein, they disagreed that having HIV/AIDS is a death sentence. They were clinically aware that having HIV/AIDS is not the end of the world; that they could have a normal life like everyone. They just need to take their medication normally and properly and live a healthy lifestyle. The researcher has discovered that respondents had a positive belief towards HIV/AIDS, while Kulwicki (1994) found that people believe that ART recipients should not be left to live freely in the community. This is a contradiction in the finding of the present research and what others have found, meaning that not everyone has the same way of beliefs. Some may have negative beliefs due to the lack of enough knowledge on HIV/AIDS.

Conclusion and Recommendations

In summary, results of the survey indicate that the overall knowledge, attitude, and beliefs of ART recipients towards HIV/AIDS and the treatment outcomes show that there were significant differences in the responses to some items. We can note that ART recipients in an infectious disease clinic demonstrated some knowledge and positive attitudes towards HIV/AIDS. The majority of patients were aware of the existence of HIV. Furthermore, the majority of participants who had the same CD4 count and a worse CD4 believed that taking HIV drugs is a waste of time, which points to a need for public enlightenment in this matter. This study revealed a significant difference between those who have a better CD4, the same CD4, and a worse CD4, based on their knowledge about taking ARVs. A better CD4 count, which is evidence of improved health status of people living with HIV/AIDS, has been found to be related to positive knowledge about taking HIV drugs, by sticking to it regularly and living positively with HIV, thereby dispelling the fear that HIV is a death sentence. People who have negative beliefs, have a worse CD4 count, are more susceptible to the disease, or have already succumbed to the disease and are more likely not to maintain a strict treatment regime, as the present study has shown. From this study it is evident that knowledge and attitude,

as explained by the Health Belief Model, have the potential to predict sick-role behaviour to particular diseases and the outcome that results from treatment. Based on the findings of this study, the efforts being made in public enlightenment with regard to HIV/AIDS transmission and treatment should be sustained, because knowledge has been found to be necessary for treatment outcome. While more clinical attention should be focused on the knowledge, attitudes and beliefs of ARV recipients, instead of relying solely on the efficacy of medications, further social and behavioural research needs to target how to modify or change ART recipients' negative beliefs, attitudes and behaviour towards HIV/AIDS treatment.

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