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Factors associated with life satisfaction among HIV-positive students in higher education institutions in South Africa

By

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DECLARATION

I hereby declare that the work titled “Factors associated with life satisfaction among HIV-positive students in higher education institutions in South Africa” submitted here is the result of my own independent investigation. Where help was sought, it was duly acknowledged. I further declare that this work is submitted for the first time at this University / Faculty towards a MMed degree in Public Health Medicine and has never been submitted (in part or as a whole) to any other institution of higher learning for the award of any degree or diploma.

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TV Makola

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Date

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1 ABBREVIATIONS

AAC	Academic Advisory Committee
CDC	Centre for Disease Control
DBS	Dry Blood Spots
GDP	Gross Domestic Product
GNP	Gross National Product
HDI	Human Development Index
HEAIDS	Higher Education HIV/AIDS Programme
HEIs	Higher Education Institutions
HEMIS	Higher Education Management Information System
HIV/AIDS	Human Immunodeficiency Virus / Acquired Immunodeficiency Syndrome
HSRC	Human Sciences Research Council
IMR	Infant Mortality Rate
KABP	Knowledge, Attitudes, Behaviour and Practice
MLE	Maximum Likelihood Estimation
MLSS	Multidimensional Life Satisfaction Scale
MMed	Masters of Medicine
PCA	Principal Component Analysis
PLSS	Perceived Life Satisfaction Scale
PLWHA	People living with HIV/AIDS
PWB	Psychological Well-Being
QoL	Quality of Life
SLSS	Students Life Satisfaction Scale
STI	Sexually Transmitted Infection
SWB	Subjective Wellbeing
SWLS	Satisfaction with Life Scales
TNM 800	Applied Research Methods
UNAIDS	Joint United Nations Programme on AIDS
WHO	World Health Organisation

2 EXECUTIVE SUMMARY

Background

HIV/AIDS remains a significant global public health challenge and in the South African context is a generalised epidemic affecting all sectors of society. One of the subpopulations known to engage in HIV risk behaviours is the university student population. Living with HIV/AIDS in a higher education institution could influence quality of life and life satisfaction negatively affecting the ability of students to complete their studies.

Aim

The aim of this study was to investigate factors that are associated with life satisfaction among higher education students who are living with HIV. The objectives investigated to achieve the aim are as follows:

- To determine the prevalence of life satisfaction in the general student population
- To determine the prevalence of life satisfaction among HIV positive students
- To explore the factors associated with life satisfaction among HIV positive students

Methodology

This was a secondary data analysis of data collected during the Higher Education HIV/AIDS Programme (HEAIDS) survey conducted during the second term of 2008 and the first term of 2009 among students in 22 South African higher education institutions (HEIs). The total number of participants during the survey was N=17,062. The Higher Education Management and Information System (HEMIS) database 2006 was used to create a sampling frame.

The present study utilised only the student component of the original study to investigate the prevalence of self-reported life satisfaction among the general student population as well as prevalence of self-reported life satisfaction among students who are infected with HIV.

Universities were categorised into large, medium, and small categories based on the numbers of staff and students so as to allocate sample sizes among the universities. Each HEI population was stratified by campus and faculty/class and then clusters of students were

selected for the study using standard randomisation techniques. Self-administered questionnaires were used to obtain demographic, socioeconomic, education-related data, behavioural and psychological characteristics such as self-esteem, optimism and life satisfaction.

Life satisfaction was assessed using a single-item measure within the questionnaire. The questionnaire was also used to obtain information on demographic, socioeconomic, behavioural, and other life satisfaction related factors. The HIV status of participants was determined by laboratory testing of dry blood spots (DBS) obtained using standard methodology. Data were analysed using chi-square and multiple-variable adjusted logistic regression.

Results

Of the study population, 52.5% were females. The overall prevalence of HIV among all students was 3.1% (n=499). Overall, 79.54% (n=12784) of the students reported life satisfaction. Reported life satisfaction was higher among HIV negative than among HIV-positive students with 79.5% and 67.6% respectively; $p<0.001$. Among the HIV-positive student population, reported life satisfaction was less frequent among students who were not married than among married students (65.7% versus 86.4%; $p=0.009$). The older the students, the more likely they were to report satisfaction with life with 61.18%, 75.39%, and 79.46% for age categories 18-24 years, 25-34 years, and 35 years and older respectively. Compared to African black students, students from other race groups were less likely to report satisfaction with life (*a*OR: 0.04; 95% CI: 0.04-0.60).

Conclusion

This study's findings suggest that the majority of students in HEIs in South Africa are satisfied with their life. However, the study also revealed that there is a need to promote life skills and psychological support among higher education institution students prioritising those who are living with HIV/AIDS especially those in the younger age-group.

3 BACKGROUND

HIV/AIDS is currently one of the most important global public health issues. However, the African region, especially sub-Saharan Africa, is by far the most affected region compared to other regions of the world. HIV/AIDS is estimated to have claimed more than 39 million lives in total with approximately 1.5 million people dying from HIV-related causes globally in 2013 alone.[2]An estimated 70% of all AIDS deaths globally occur in the African region and specifically sub-Saharan Africa.[1,2,3]

South Africa is one of the countries with the highest prevalence of HIV estimated at 12.2% in 2012.[1]According to the South African Human Sciences Research Council (HSRC) survey, South Africa had over 400 000 new cases of HIV infections in 2012.[1] Currently, UNAIDS estimate the HIV/AIDS prevalence rate among adults aged 15-49 years of age to be 19.1%.[3] The highest prevalence is among females between 20 and 34 years of age and males between 25 and 49 years.[3] Access to sexual and reproductive health services and lack of comprehensive and correct HIV knowledge are some of the factors postulated to be related to the continuous challenge of significant HIV incidence in the sub-Saharan African countries like South Africa.[1,3]

Young people between the ages of 15 and 24 years of age constitute one of the subpopulations in South Africa known to engage in HIV high risk behaviours including students in HEIs.[4, 5] A study by Heeren et.al in 2007 found that 26% of university students at a South African university reported ever being pregnant or fathering a pregnancy while 15% reported a history of having suffered from a sexually transmitted infection (STI). STIs have been shown to increase an individual's susceptibility for acquiring HIV infection.[4]

HIV/AIDS has evolved from being a relatively rapid fatal infection to a more chronic and manageable illness. Therefore, both the physical and mental wellbeing of people living with HIV/AIDS (PLHWA) have become important in the overall management of the infected individuals.[2, 3]

HIV infection in South Africa is a generalised epidemic affecting all sectors of society, albeit to different degrees.[1, 3]The Higher Education sector is one of the sectors of the South African society that has to respond adequately to the challenge of HIV.[4, 5] Knowledge regarding factors influencing life satisfaction is important to improve retention and ensure graduation of students living with HIV in South Africa.[4, 5]

Students in HEIs, especially in the undergraduate period, are at a stage of their lives that is characterised by a number of challenges including academic, financial, and socio-cultural challenges.[4,5, 6, 7] HIV diagnosis made during this period will be an additional burden and has the potential to negatively affect their ability to successfully complete their training if adequate support is not provided.[5, 6, 7]

Success in life is dependent on maintaining both the physical and psychological well-being.[6, 7, 8] Life satisfaction is used as a measure of well-being and is a direct indication of the quality of life.[8, 9, 10]Life satisfaction include "a feeling of contentment with one's life, lack of dissatisfaction with domains of one's life or a global evaluation by an individual of his or her own life" .[8, 9, 10] McDowell and Newell (1987) defined quality of life as a phenomenon that involves the adequacy of material circumstances of an individual or community and their subjective feelings about these circumstances.[7, 8, 9, 10]Factors such as self-esteem, living condition, social support, stigma and discrimination, socio-economic status, and increased physical well-being have been found to influence life-satisfaction among students and people living with HIV and AIDS (PLWHA).[8, 9, 10, 11, 12]

The main purpose of this study, therefore, was to identify and explore factors that are associated with and possibly predictive of life satisfaction among HIV positive students in higher education institutions in South Africa.

4 LITERATURE REVIEW

4.1 Concept of human wellbeing

Human wellbeing is a multifaceted concept and difficult to define leaving the fields of psychology, economics and public health to grapple with this challenge.[7, 8] Despite the fact that human wellbeing is a rapidly growing area of research but definitions remain very broad and imprecise.[8, 9, 10] Shin and Johnson in 1978 defined wellbeing as "global assessment of a person's quality of life according to his or her own chosen criteria".[9, 10] This definition continues to be widely used in contemporary literature and also introduces the concept of "quality of life".[11] Dodge and her colleagues more recently, have proposed a new definition of wellbeing as "the balance point between an individual's resource pool and the challenges faced".[8,9,10] Wellbeing can also be referred to as the ability of an individual to fulfil their goals, and embedded within the concept of wellbeing are the constructs of happiness and life satisfaction.[8, 9, 10, 11] The lack of consistency in definition has led to conceptual ambiguity in terminology of wellbeing, and the related concepts of quality of life and life satisfaction.[8. 9]

Although wellbeing is difficult to define, aspects that are known to constitute wellbeing include factors such as autonomy, environmental mastery, positive relations with others, purpose in life, realisation of potential, and self-acceptance.[8, 9, 10]

The concept of wellbeing has three main dimensions namely subjective, psychological and social components.[8, 9, 10, 11]In addition, wellbeing has historically consisted of two main traditions which are known as the hedonic and eudaimonic traditions. [8, 9, 10, 11]Hedonic tradition defines wellbeing in terms of constructs such as happiness, positive affect, low negative affect and satisfaction with life as reflected in the stream of research on subjective wellbeing. [8, 9, 10, 11]Eudaimonic tradition, on the other hand, equates wellbeing with human potential and emphasises positive psychological functioning and human development and is reflected in the stream of research on psychological and social wellbeing. [8, 9, 10, 11]

The challenge of wellbeing as a concept is not limited to definition only, but it has proven to be just as challenging with respect to measurement.[9, 10]Measures of wellbeing can be broadly classified into 2 categories which are objective and subjective measures. [9, 10, 17, 19, 20]

Objective components of wellbeing are relevant for populations rather than individuals or sub-groups within populations and the dimensions are usually measurable and sometimes observable facts including economic, social and environmental statistics. [9, 10, 17, 19, 20]These objective measures of wellbeing have been widely considered as indirect cardinal measures of wellbeing of populations and have gained recognition within the public policy environment.[17, 19, 20, 21] They include measures such as gross domestic product (GDP), GDP per capita, gross national product (GNP), infant mortality rate (IMR), homicide or suicide rate, environmental degradation, gross human rights violations, and a composite measure known as human development index (HDI) which comprises of life expectancy at birth, income per capita, education achievements such as education enrolment ratios and adult literacy rates, and income per capita measured in purchasing power parity. [17, 19, 20, 21]

Individual wellbeing, on the other hand, is influenced by elements such as economic, social and cultural factors and is captured by subjective wellbeing components. [19, 20, 21] Subjective wellbeing measures are about individual's feelings and experiences as seen through ordinal measures and is characterised by emotional, psychological, and social components.[8, 9, 17, 19, 20] The emotional component is made up of positive and negative affect while the social component is about the quality of relationships with others. [8, 9, 17, 19, 20]The psychological component refers to the evaluation of one's circumstances including an overall sense of satisfaction, life satisfaction, and is located within the psychological and cognitive aspects of subjective wellbeing. [8, 9, 17, 19, 20]

4.2 Wellbeing conceptual framework

For the purpose of this study, human wellbeing is considered as a construct that is constituted by two components, namely objective and subjective components. This framework is in line with the model of wellbeing as described of Diener and Suh in 1997. The subjective wellbeing component is made up of the hedonic and eudaimonic traditions as described above. Life satisfaction, the main interest of this study, is located within the hedonic tradition of subjective wellbeing.

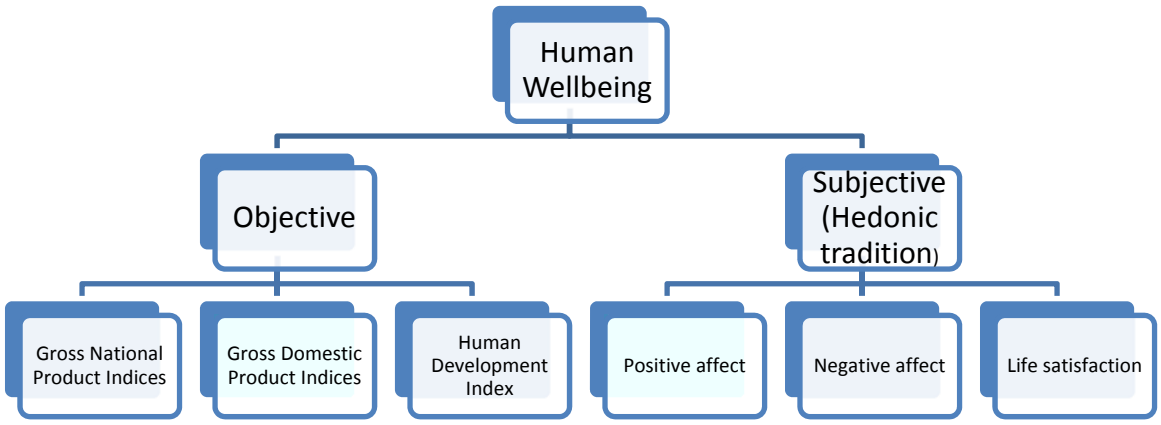

Figure 1: Conceptual framework showing how life satisfaction relates to overall wellbeing

4.3 Subjective wellbeing

Subjective wellbeing (SWB) approach provides a useful perspective from which to assess and understand an individual's wellbeing.[8, 19]This approach has some distinct and advantageous features.[8, 19] Firstly, it assesses the subject's overall wellbeing rather than a specific aspect of their lives. [8, 9, 10, 19] Secondly, it uses an inferential approach which is based on the individual's own terms and circumstances rather than someone else's perspective of what those circumstances ought to be. [8, 9, 10, 19]Thirdly, it is inherently subjective and recognises that it is the person themselves who is best suited to assess their own condition and wellbeing. [8, 9, 10, 19]Finally, it is contextual and premised on the idea that the wellbeing of any person should be declared by that person themselves within their particular set of circumstances.[8, 9, 10, 19]

Subjective wellbeing takes into consideration all the facets of an individual that essentially makes them who they are and includes features such as beliefs, values, cultural biases, goals, ambitions, intellectual and emotional capabilities, education level, memories, childhood and adolescent experiences, traumatic experiences, and relationships with parents, relatives, intimate partners and friends.[19, 20] Subjective wellbeing perspective, therefore, encompasses those aspects of an individual's life that have an impact on their overall quality of life. [19, 20]

SWB is related to the faculty events and refers to a person's cognitive and affective evaluations of an individual's life.[8-11, 19, 20]The two main components of SWB are the cognitive aspect which is about life satisfaction while the affective aspects are about pleasant and unpleasant affect. [8-11, 19, 20]The affective aspect of SWB is about happiness and is seen as the emotive interpretation of subjective wellbeing. [8-11, 19, 20]

SWB is commonly assessed by asking the subject a single question such as "How satisfied are you with your life as a whole?" and such a question is assumed to elicit a response that constitutes a global evaluation of one's life. [8-11] It is however important to note that in contrast to single item measures, multi-item measures of wellbeing have also been developed and used with the intention of increasing reliability. Such tools or measures include life satisfaction scales such as satisfaction with life scales (SWLS) and affect scales. [8-11]

SWB has been increasingly recognised as an important element of human wellbeing but has been slow to gain credibility within policy circles in contrast to indicators of objective

wellbeing.[8, 9, 19, 20] There are however an increasing number of studies that have demonstrated some correlation between objective indicators of wellbeing such as GDP per capita and subjective wellbeing indicators such as life satisfaction. [8, 9, 19, 20]There has also been a steady increase in interest and research into SWB as a concept and specifically to its cognitive component of life satisfaction. [8, 9, 19, 20]

4.4 Life satisfaction as an indicator of human wellbeing

Life satisfaction is one of the three components that constitute subjective well-being of an individual and is often defined as a comprehensive cognitive evaluation by the individual of their life circumstances at a particular point.[8, 17-20] Life satisfaction is widely acknowledged as a reliable and useful measure of a person's subjective wellbeing and has received significant academic interest in recent years especially in the field of anthropology, sociology, political science, psychology, economics and public health.[8, 9, 17, 19]

Life satisfaction reflects an individual's conscious and cognitive appraisal of their life circumstances or the quality of their life. [8, 17, 18, 20] In essence, life satisfaction is a subjective assessment of the quality of one's life.[19, 20]This evaluation should be considered as a global assessment of their circumstances or appraisal within specific life domains such as self, health status, family or work.[19, 20] It is generally acknowledged that no single factor or variable can influence an individual's level of satisfaction in isolation without interacting with others in one way or the other. [19, 20]

Life satisfaction, as a phenomenon, is located within the paradigm of SWB and recognises that it is the person or the individual themself who is best suited to assess their own state of wellbeing.[17, 18, 19, 20]SWB comprises both the individual's cognitive and affective evaluation of their own lives and is therefore a reflective assessment of how well things are going and have been going.[19, 20]

The cognitive aspect of the assessment, known as life satisfaction, is based on the individual's belief of how their life should be in contrast to their current circumstances and therefore

captures an individual's perceived distance from their aspiration.[18, 20] The cognitive evaluation can be viewed as a perceived discrepancy between an individual's current circumstances and the ideal circumstances in relation to global and/or domain specific conditions. [18, 20]

Once the inherent subjectivity of wellbeing is accepted and acknowledged as such, it becomes possible to juxtapose this against the commonly used objective indicators that have always been regarded as good proxies of wellbeing.[20]

Life satisfaction is widely acknowledged as a multi-dimensional construct that consist of domains of life such as health, socio-economic status, education and overall function. Various factors have been found to impact either positively or negatively on life satisfaction and these include socio-demographic variables such as gender, race, employment status, living conditions, social status and income adequacy.[17, 19, 20]

There are many aspects to an individual's life.[19, 20] Therefore, wellbeing and life satisfaction have been known to be impacted upon by all of these aspects of life, albeit, to varying degrees.[19, 20]These aspects are often referred to as domains of life and are concrete areas within which an individual function as a human being and there are seven recognised life satisfaction domains of life.[19, 20]These are:

- **Health-related domain**. This domain deals with current health status of an individual and with the availability of quality health services within the environment in which the individual resides.
- **Economic-related domain**. This domain encompasses aspects such as housing and living conditions, income's purchasing power within the current economic conditions, and the financial solvency of the individual.
- **Job-related domain**. This domain with an individual's job activities and responsibilities, work shifts, and hierarchical working relations.
- **Family-related domain**. This domain is about an individual's quality of relationship with spouse or stable partner, children, and rest of family.
- **Friendship-related domain**. This domain is about the quality of one's relationship with friends and quality of time spent with them.

- **Personal-related domain**. This domain encompasses aspects such as time available to pursue hobbies, engage in activities that enhance personal growth, and educational level.
- **Community environment-related domain**. This domain is about an individual's satisfaction with public amenities such as municipal services, public transport system, neighbourhood safety, and road conditions.[19,20]

Some of the characteristics or features that have been identified as critical determinants of life satisfaction and overall subjective wellbeing include values, goals, aspirations, beliefs, traumas, cultural biases, ambitions, intellectual and emotional capabilities, education, childhood and adolescence experiences, dependencies, and selective memories. Life satisfaction therefore recognises the role of an individual's psychosocial makeup or factors such as culture and belief systems in determining their level or degree of happiness. [17-20]

Life satisfaction has been shown to be associated with a number of positive outcomes such as emotional buoyancy, academic performance, mental satisfaction, healthy positive relationships and mental vitality.[17, 18] Life satisfaction is identified as one of the requirements for healthy and effective psychological functioning of a human being and is considered a key indicator of successful adaptation to changes in life circumstances.[17, 20]

Life satisfaction in surveys is commonly assessed by asking the subject either about their satisfaction with life as a whole or alternatively asks about satisfaction within specific domains of their lives such as work, marriage, or health.[17, 19, 20] There are many tools that have been developed to measure life satisfaction such as satisfaction with life scale (SWLS), perceived life satisfaction scale (PLSS), students life satisfaction scale (SLSS), and multidimensional life satisfaction scale (MLSS).[20] However, life satisfaction can also be measured with single-item measures and these have been shown to have satisfactory validity and reliability.[20,21,22]

A person's satisfaction with life could be influenced by life events such as a diagnosis with an incurable disease, as well as socio-economic and demographic characteristics like class, gender, age, education level, marriage status, and employment status.[13, 14, 15, 16, 20] These factors do not only determine the level of life satisfaction but also influence ways that personal and societal conditions affect one's life satisfaction.[17, 19, 20]

4.5 Quality of life and how it relates to life satisfaction

Quality of life (QoL) is a multidimensional concept that is hypothesised to comprise of life satisfaction, happiness and optimism.[23,24]There is no single universally accepted definition, theory or methodology for measuring QoL.[23, 24, 25]There are, however, generally agreed core components which constitute QoL and these components can be broadly categorised into personal and socio-environmental components.[23, 24, 25]

The personal components of QoL include an individual's health status and the subjective wellbeing construct of life satisfaction.[23, 24]The socio-environmental components of QoL include amenities such housing, schools, health services, safety and security as well as roads and transport.[23, 24] Although QoL has no universally accepted definition, it is recognised as consisting of two dimensions which are objective and dimensions. [23, 24]

World Health Organisation (WHO) defines quality of life as "an individual's perception regarding his or her position in life in the context of culture and value systems in which they live and in relation to their goals, expectations, standards and concerns".[8, 23, 24] Centre for Disease Control (CDC) identified QoL as "all aspects of community life that have a direct and quantifiable influence on the physical and mental health of its members". The main aim of QoL is to "enable people, as far as possible, to achieve their goals and choose their ideal lifestyle". [8, 23, 24d] QoL refers to the adequacy with respect to material conditions or position as well as to the individual's own feelings about these circumstances.[19, 23, 24]

QoL comprises a variety of conditions, physical, psychological, environmental, social and spiritual which can affect an individual and is generally more cognitive.[8, 9, 19, 23, 24]QoL is about the extent to which human needs are fulfilled within the context of individuals' or groups' perception of what their conditions ought to be.[19,20,23] The main recognised domains of QoL include material wellbeing, health status, productivity, intimacy, safety, place in the community, and emotional wellbeing.[8, 19, 23]

There is increasing recognition and acceptance of QoL as a critical endpoint or outcome measure in medical research especially within the context of chronic illnesses where there is no cure.[23,25,26] Although the concept of QoL has gained popularity in this regard, research has been hamstrung by lack of conceptual clarity as far as definition is concerned. [23, 25, 26]

The concept of life satisfaction or overall satisfaction with life is recognised as one of the components and indicators of quality of life that has become increasingly accepted an outcome measure in medicine and healthcare. [23, 25, 26]Life satisfaction, as a concept, is closely related to QoL but these two concepts are not identical although they have often been used interchangeably in other contexts.[19, 23, 24] Life satisfaction is widely acknowledged to reflect the more cognitive aspect of an individual's perception of their quality of life and wellbeing.[19, 20, 23]

There are a number of factors have been identified as being able to either predict or influence QoL.[23, 24]These factors include socio-demographic variables such as age, race, gender, education level, economic status, satisfaction with basic governmental services, vulnerability to crime, and geo-type status such as urban versus rural and formal versus informal versus tribal dwellings. [23, 24]

QoL is an important phenomenon in public health as it may inform and influence policy development, health services planning and health needs assessment, health services management, and resource allocation in the health sector.[17, 19, 23, 24]

4.6 Life satisfaction and Quality of life in the context of HIV disease

Good health is an accepted, important, and an indispensable pre-condition for any individual to experience a high quality of life. Life satisfaction and quality of life in general has for some time been recognised as important in the context of chronic and debilitating illnesses such as cancers, dementia, mental and psychiatric conditions, developmental disabilities, and more recently HIV/AIDS.[17, 19, 20, 23]

HIV diagnosis is a serious, traumatic and a major life event at any stage of a person's life and places a unique burden on every aspect of the daily life of the infected person.[12-16] People living with HIV infection are faced with both physical and psychological challenges related to the disease, medication and its side effects, and other challenges such as stigmatisation and discrimination. Some of the challenges associated with HIV diagnosis can have an impact on a range of other issues such as changes in daily life, decision to access care, disclosure, self-esteem, stigma, fear and depression. [12-16]

HIV infection has the potential to negatively affect an individual's self-esteem, coping mechanisms, resulting in social isolation and poor psychological well-being.[25, 26, 27] Many people generally experience some form of disruption to their lives following diagnosis of a chronic illness such as HIV.[12, 13, 16, 25, 26] There is generally a significant psychological insult of being diagnosed with HIV which is an incurable, highly stigmatized and occasionally fatal disease which can also be incapacitating, and potentially disfiguring.[25-29] The experience of being diagnosed with HIV is extremely stressful and often depressing and can be accompanied by feelings of shock, disbelief, denial, personal grief, anger, fear of death, fear of disclosure status, sense of loss, and depression.[28-31]

Some of the key challenges related to being diagnosed with HIV include, but are not limited, to the following:

- The shock or trauma related to testing positive,
- Disbelief, personal grief, and anger
- Concerns about one's health including fear of death
- Concerns about disclosure to family and friends
- Availability of clinical or medical and other support services
- Stigma and discrimination related to being HIV infected
- Concerns about treatment side effects
- Loneliness, isolation and sense of loss
- Feelings of despair and hopelessness about future prospects.[29, 30, 31]

In the context of illnesses or diseases, other factors that have been found to impact on life satisfaction and QoL include overall health status which encompasses physical, emotional, psychological and social well-being.[29, 32,33] In terms of HIV, additional factors that have been associated with life satisfaction include disclosure or non-disclosure of HIV-status, HIV-related discrimination and stigmatization, perceived stress, presence or absence of a social support network, physical functioning, sexual functioning and access to appropriate medical services.[31, 34, 35] Factors such as social support networks and illness-related stigma are directly related to the level and kind of support that an individual can mobilise in the face of a traumatic situation such as an HIV diagnosis.[25, 26, 34, 35, 36]

Patients with chronic diseases including HIV may experience a decrease in QoL and life satisfaction although this may not be the case in all cases.[25, 26] Over the last decade and a half, HIV has changed from being a primarily terminal or fatal disease to being a chronic manageable condition. [12, 13, 16, 25, 26]This important development as far as HIV is concerned has mainly been as a result of advances in the efficacy and availability of highly active antiretroviral drugs. [12, 13, 16, 25, 26]

Patients with HIV are therefore living longer and as a result, the quality of life of these patients is increasingly becoming an important consideration.[25-29]QoL among PLWHA is influenced by multiple factors such as individual, cultural, emotional, and social factors.[25,28, 29, 32]Besides the chronicity of HIV infection, life satisfaction in the context of HIV is also important because it has been shown to have significant influence on extent and appropriateness of medical decision making as well as other critical factors such as coping and social support.[28, 29, 31]

WHO and UNAIDS, in the year 2000, acknowledged that improving the quality of life is a central issue to the care and support of people living with HIV/AIDS.[25,26] There are a number of studies that have established that HIV/AIDS has a negative impact on the QoL of PLWHA.[25,26]Patients suffering from chronic illnesses often experience a decrease in quality of life and life satisfaction but there have been studies that have demonstrated positive effects following diagnosis with life threatening conditions.[25, 26, 32, 33] For instance, cancer patients have, in some instances, been known to experience significant personal growth following the initial traumatic stress of diagnosis while HIV infected individuals have, in some cases, experienced an increase of religiousness or spirituality.[31,32,33]

4.7 HIV, life satisfaction and psychological wellbeing

The concept of psychological well-being (PWB) is important in considering an individual's well-being and overall life satisfaction.[9, 10, 11]A universally accepted definition for psychological wellbeing has been difficult to construct but there is general agreement on the dimensions or facets that constitute PWB. [9, 10, 11]The PWB dimensions include self-acceptance, positive relations with others, personal growth and development, autonomy in thought and action, environmental mastery, and purpose in life. [9, 10, 11]

There is significant evidence from multiple studies globally that suggests that psychological wellbeing has a positive influence on an individual's ability to both withstand and adapt to personal adverse events.[10, 11, 14] Risk factors have also been identified which generally increase a person's vulnerability in the event of a traumatic life event such as a diagnosis with cancer or HIV infection. [10, 11, 13]There are also protective factors or those that have been identified as protective in the face of a similar event. [10, 11, 13, 19, 23]The balance or the interaction between both the risk and protective factors are predictive of an individual's ability to withstand a potentially traumatic life event. [10, 11, 13, 19, 23]

A significant amount of research has been undertaken globally on factors that impact on the psychological wellbeing, including life satisfaction, of different sub-groups or populations of people living with HIV and AIDS (PLHA).[12, 13, 15, 16]In the context of HIV, factors that have been found to impact on wellbeing include disclosure or non-disclosure of HIV-status, presence or absence of a social network, domestic factors such as income adequacy and living with spouse and/or children in the same household.[15, 25, 29]These factors have been shown to influence the level and kind of support that an individual can mobilise in the face of a traumatic situation such as an HIV diagnosis. [15, 25, 29]

4.8 HIV and life satisfaction within higher education environment

Globally, students in HEIs have to contend with various challenges that include academic requirements, financial obligations associated with higher education studies, and socio-cultural adjustments such as making new friends, initiating intimate relationships, transitioning from teenage years into young adulthood and living away from home.[4, 5, 7, 18, 36-38] Therefore, for the majority of students, this is a time of self-discovery, exploration of their environment, maturing into adults, and trying to define their roles in the world. [4, 5, 7, 18, 36-38]

University students represent a special and important segment of the population of any society.[7, 17, 18, 36-38]They constitute a vital sub-population from a number of perspectives. Firstly, they represent the nation's future human capital and therefore an important societal economic investment. [7, 17, 18, 36-38] Secondly, university students are at a developmental stage in terms of somatic development from adolescence to young adulthood as well as mental, emotional and social development. [7, 17, 18, 36-38]Young adulthood is a stage of life usually characterised by challenges of trying to establish an identity, adjust to increasing

independence from parents, and establish intimate relationships as well as strengthening relationships with friends. [7, 17, 18, 36-38]

Life satisfaction among university students has been shown to be associated with good health, emotional buoyancy, healthy lifestyle and increased motivation for academic performance and productivity. [7, 18, 36-38]O'Neill in 1991 argued that life satisfaction is a critical and important obligation of education.[36,37,38] Quality of life, including life satisfaction, of students in HEIs is dependent on factors such as physiological and psychological wellbeing as well as overall personal development of students. [36, 37, 38]

A number of explanatory variables have been found to be responsible for higher levels of life satisfaction with university life.[37, 38]These explanatory variables include satisfaction with academic work, satisfaction with level of academic resources, time management, income level, good and solid relationships formed, and good reputation of the university. [37, 38]

Education is a recognised determinant of individual wellbeing. [17, 36, 37, 38]A significant number of studies have reported a positive relationship between education and subjective wellbeing whereas only a few studies have reported negative association. [17,36,37,38]

Students in HEIs have to contend with various challenges, as mentioned earlier, which place a heavy strain on the coping resources of students.[36, 37, 38]The ability of students in HEIs to cope with stressful situations is affected by their social, physical and financial resources. [36,37,38] Stress among students is a consequence of an imbalance between perceived demands in their environment and perceived coping resources.[36,37,38] If these demands exceed or are perceived to exceed the personal capacity to cope they can trigger stressful reactions.[36,37,38]

Some of the key socio-demographic determinants of life satisfaction among university students include gender, family income, academic performance, self-image, physical health status, familial relationships, intimate relationships, and relationships with friends.[7, 18, 36] Therefore, being diagnosed or living with HIV, constitute an additional burden which can increase the level of already elevated stress among HEI students and may impact on the quality of life of a student and thus their satisfaction with life. [4,5,7,36,37]Students in HEIs generally represent the future of any society in which they come from and constitute an integral part of future leadership of their society.[7, 17, 18] The students in HEIs are critical to the

economic development of their societies. [7, 17, 18] The investment that a country makes in the education and training of its youth is usually substantial and therefore a country such as South Africa must ensure that it supports its youth to successfully complete their training.[5,17]

A number of studies conducted in different sets of circumstances globally have identified factors or variables that influence life satisfaction of individuals. The factors that influence life satisfaction among the general population are also applicable to students in HEIs. These variables include but are not limited to the following:

4.8.1 Perceived stress

HIV disease is a recognised cause of emotional and psychological stress.[15, 16] Perceived stress is a complex phenomenon with suggestions of multifactorial aetiology. It is defined as a relationship or an imbalance between the environmental trigger or stressor and an individual's coping resources or capacity to deal with that trigger and therefore negatively affecting his or her wellbeing.[8, 9, 18, 35-39]There are several identified factors associated with HIV-related stressors such as socio-economic issues, hopelessness, stigma and uncertainty about the future.[15,25,35,39-41] Perceived stress has been shown to be higher among HIV infected students than in non-HIV infected students.[41, 42]

Studies have demonstrated that perceived stress among people with recent HIV diagnosis and generally among PLWHA experience significant psychological stress or mental health problems like depression, anxiety and suicidal ideation.[15, 16, 29, 30] There are also stressful life events such as HIV status disclosure or non-disclosure to spouse, family and friends, HIV-related stigma and perceived discrimination.[30-32] The above-mentioned factors together with other factors such as social support are determinants of stress levels among PLWHA. [30-32]

A study by Matheny et al done among university students in the United States identified perceived stress as one of the factors that are useful in predicting life satisfaction among this group.[36] Higher levels of stress among students in HEIs have been shown to be associated with lower levels of satisfaction with life.[33-39] Satisfaction in other domains of life such as relationships with family and significant others can influence life satisfaction.[36, 37]

4.8.2 Living condition

Living conditions or circumstances are recognised as one of the basic factors that influence an individual's perception of their well-being.[15, 23, 31, 38-40] This observation has been corroborated by studies that have shown that college or university students who are more satisfied with their living environment such as housing facilities and campus facilities and have lower perceived stress express a higher level of life satisfaction.[38, 39]

Living conditions are regarded as a component of material conditions of an individual and such material conditions have been shown to impact on life satisfaction.[15, 23, 38] It is, however, worth noting that although material conditions such as income, material possessions, employment status and living conditions have been found to influence life satisfaction positively in a number of studies, this observation has not been observed in other contexts and where these variables were used in regression analysis, they were found to explain only a relatively small amount of the variance.[36, 38]

4.8.3 Social support

Social support is defined as the knowledge of being able to count on the assistance of others should the need arise, and the feeling of being valued, cared for and loved.[12, 15, 18, 23] Social support is recognised as an essential factor with the potential to influence health outcomes in various health situations or conditions and a strong predictor of life satisfaction.[12, 32, 43- 47] Social support has also been identified as playing a role in protecting individuals during stressful times such as during serious or life threatening illnesses.[23, 32] People living with HIV/AIDS (PLWHA), at different stages of the disease, are faced with specific stressors to which support can be directed against such as disclosure of their HIV status, access to care, treatment and support, fertility and parenting issues, academic and employment prospects, HIV-related stigma and discrimination.[32, 47, 48]

The types of social support needed are usually categorised into informational, instrumental and emotional support.[23, 32, 48]The different types of support may be required by PLWHA in varying degrees and at various stages of the HIV disease. [23, 32, 48]Studies have shown that informational support is often more required by PLWHA in the early stage of HIV disease than the other two types of support. [23, 32, 48] Informational support refers to support with regard to

the meaning of a positive HIV test, implications with regard to immediate access to medical care and support and other services that are required for any individual who is HIV positive. [23, 32, 48] Emotional support has been shown to be related to positive health outcomes in patients with chronic diseases like HIV, spinal cord injuries and stroke.[32,47,48-50,54]

Source of support has also been shown to be an important factor and could be from partners, other members of the family, and close friends.[48-50, 54]Other sources of support include community structures such as peer support groups, church groups, and professional entities such as help-lines and drop-in centres. [32, 47, 48-50]These different sources of support have their advantages and disadvantages. [32, 47, 48-50]

4.8.4 Despair and hopelessness

Hopelessness is widely recognised as a feeling of despair associated with significant pessimism about one's future.[51-55, 60, 64] Feeling of despair and hopelessness has consistently been shown to be associated with testing positive for HIV and is highly correlated with symptoms of depression.[30,34,**35, 45, 52-55**] If this feeling of hopelessness is not identified and not dealt with early and adequately or are left unchecked then an individual might deteriorate and find it difficult to cope with the HIV diagnosis and thus may affect the mental or psychological health that may ultimately result in a major depressive episode and suicidal ideation.[32, 47, 48, 50, 57-61]

4.8.5 Socio-economic and demographic factors

An individual's satisfaction with life is influenced by socio-economic and demographic characteristics which encompass social stratification such as class, gender, age, marital status and education level.[13, 15, 18, 25, 26, 52, 53]Studies have shown that characteristics such as age, gender and education may have varying impacts on life satisfaction depending on the context.[25, 26, 52-56] It is noteworthy that these characteristics can either have a positive, negative or neutral impact on life satisfaction.[25, 26, 52, 62] Other factors that are important in determining the life satisfaction of an individual include income adequacy, material possessions, strength of social relationships, social support, violence, physical and sexual abuse, drug use, tobacco and alcohol use.[15, 52, 62, 63 , 65-67]

In summary, students in HEIs face multiple challenges and therefore an added diagnosis of a serious condition such as HIV can have potentially catastrophic consequences.[4,5,7,36,37]It is therefore important that HEIs in South Africa respond appropriately to the challenge of HEIs students that are infected with HIV.[5] HIV diagnosis made during this period has the potential to derail the future of the affected students, thereby negatively impacting on their immediate families and possibly that of the country at large.[17,18,37,38] The prospects of successfully completing their studies and training are dependent on the provision of adequate support because success is dependent on maintaining physical and psychological well-being.[17, 18, 37, 38]

5 PROBLEM STATEMENT

HIV diagnosis is a traumatic and stressful event at any stage of a person's life with the potential to derail life plans.[1,5,12] It has serious implications for many aspects of an individual's life such as reproductive health, mental health, overall personal health, career choice and financial security impacting on overall quality of life, optimism for the future, wellbeing and life satisfaction.[13-16]

Students in HEIs are faced with many challenges such as academic requirements, financial challenges associated with funding their studies, as well as emotional and socio-cultural challenges associated with post-secondary education.[4, 5, 6, 7]A serious and life changing event such as an HIV diagnosis will invariably increase the burden of challenges faced by any particular student and may negatively impact on their life satisfaction.[12, 13, 15]

There is limited knowledge on the issues surrounding life satisfaction among HEI students in South Africa and even more so for those living with HIV/AIDS.[17, 18]The findings of this study may inform educators, administrators and policy makers in tertiary institutions in South Africa as well as in other developing countries to identify and implement programmes to support students who are infected with HIV/AIDS. Such programmes need to be appropriate, evidence-based and address factors that have been shown to impact positively on the quality of life and wellbeing of the affected students.

6 AIM AND OBJECTIVES

6.1 Aim

The aim of this study was to investigate factors associated with life satisfaction among students in higher education institutions living with HIV in South Africa.

6.2 Specific objectives

- To determine the prevalence of life satisfaction in the general student population
- To determine the prevalence of life satisfaction among HIV positive students
- To explore the factors associated with life satisfaction among HIV positive students

7 METHODOLOGY

7.1 Introduction

The researcher used secondary data from an HEAIDS survey that was conducted among staff and students in higher education institutions in South Africa. The HEAIDS survey was conducted in the second semester of 2008 and during the first three months of 2009.

The survey comprised of two components among staff and students at 22 higher education institutions (HEIs) across South Africa. The first component consisted of a cross sectional HIV prevalence, knowledge, attitudes, behaviour and practice (KABP) survey while the second component was a qualitative study.

Contemporary societies have adopted the survey method as a tool for assessing and measuring various aspects of itself.[68] Areas of human endeavour that utilise surveys range from social sciences and political sciences to economics and health and in particular public health. Surveys are important in informing and influencing policy and decision making.[68]In policy circles, survey results can be used to initiate or facilitate development of a new policy or evaluation of existing policies.

Over time there has been progress from simply using survey data to describe populations and population characteristics to using it for more complex exploration of possible relationships among different factors and variables within society.[68] At the same time, advances and developments of statistical theory and techniques was also important in ensuring that there was progress in the science and methodology of survey data analysis.[68]

The Health sciences and its various disciplines including public health have also benefited from these developments.[68]A number of national and international surveys are now firmly established within countries in the field of health sciences such as demographic health surveys that are undertaken regularly to provide important information about populations.

Survey data analysis incorporates a number of distinct sequences of steps to ensure that the data is correctly analysed and converted into useable information for decision making.[68] The steps in survey data analysis include defining the study problem, the objectives, understanding the sample design, understanding design variables and underlying constructs, analysing the data, interpreting and evaluating the results of the analysis, and finally reporting of estimates and inferences from the survey data.[68]

It is against this background that survey data is being used to explore factors that are associated with life satisfaction among students in HEIs including those that are currently living with HIV.

7.2 Study design

This study was a population-based cross-sectional analytical study using secondary data from the HEAIDS survey.

A population-based cross sectional study design was the most appropriate study design because this technique allowed for the snapshot assessment of life satisfaction among the HIV infected students at HEIs in South Africa. Life satisfaction, as a measure of wellbeing, among individuals is generally stable over a period of time and therefore its assessment in a cross sectional study is usually a good reflection of wellbeing of the affected individual at that particular point in their lives.

The use of secondary data, in this study, was also appropriate as this allowed us to use data that was already publicly available and collected in a scientifically acceptable way. The data was considered to be of higher quality as it involved a larger sample of students in HEIs from across South Africa and therefore have greater external validity. Although the data was collected for a different research purpose, the questionnaire used in the original study had elements that addressed life satisfaction of the participants. It was therefore both appropriate and cost effective to use the data to address the research question of interest in this study.

7.3 Study population

The study population within the HEI sector was divided into two main groups: students and staff. Students were defined as those registered for one or more courses during the second semester or term of 2008, or during the first three months of study in 2009. Both undergraduate and postgraduate students of all nationalities were considered although only contact, non-distance students were included in the study population.

A total of 17 602 students from 22 HEIs took part in the HEAIDS survey and were included in the present study. All 22 HEIs were universities and universities of technology grouped into large, medium, and small categories based on the number of students in that institution. The institutions comprised of 16 universities and 6 universities of technology. There were no nursing, teacher training, further education and training, and agricultural colleges that were included in the original study.

A contact student was defined as a student who attended classes/lectures/tutorials or laboratories at a defined campus of the institution for the purpose of learning. Undergraduate students included those studying for certificates, diplomas and degrees while postgraduate students included those studying for postgraduate diplomas and certificate, honours, masters, and post-doctoral studies.

The present study utilised only the student component of the HEAIDS survey to determine the prevalence of self-reported life satisfaction among the general student population, the prevalence of self-reported life satisfaction among students who are infected with HIV, and explore factors associated with life satisfaction among the HIV positive students.

7.4 Sampling

The Higher Education Management and Information System (HEMIS) database 2006 was used to estimate the student population in the original study. Universities were categorised into large, medium, and small categories based on the numbers of staff and students so as to determine sample sizes among the institutions. Small institutions were those with less than 20 000 students, while medium institutions were those with between 21 000 and 35 000 students, and the large institutions were those with more than 35 000 students. The minimum

sample size of students per institution was 562 in small institutions; 737 in medium institutions and 1 053 in large institutions.

The 22 universities that were part of the study were considered as strata, which were divided into two sub-populations of students and staff. In cases of multiple campuses within an HEI, if student populations were expected to be substantially different at different campuses and if the campuses were sufficiently large to justify presence of a sampling team for a full day, the campuses were separated into strata and departments randomly selected within each campus stratum.

Faculties were combined into groups according to HEMIS categories to facilitate data collection. The process of combining faculties into these groupings was also done to facilitate efficient sampling within the faculties and departments. The groups were then considered as strata. The faculty groupings used were:

- Natural sciences, engineering, and agricultural sciences
- Arts, education, and theology
- Law and economics/management

A list of all departments and number of students registered for courses offered by each department was obtained from each of the institutions. One department was randomly selected from each faculty stratum with probability of selection proportional to departmental size. For each selected department, courses offered by the department were randomly ordered, with larger classes having greater probability of being near the end. Classes were oversampled in order to ensure that the minimum sample size would be obtained at each institution.

7.5 Data collection

7.5.1 Measurements

The HEAIDS survey used a self-administered questionnaire (See appendix 1). The questionnaire consisted of 10 pages of questions with multiple choice answers. The questionnaires were available in both English and Afrikaans.

The questionnaire collected demographic characteristics of the participants that included information on age, gender, race, religious affiliation, marital status, citizenship status, country of origin if not South African, faculty/field of study, name of their institution, whether they were an undergraduate or postgraduate student, the number of years completed as a student in that institution, and whether they were registered as full-time or part time students.

Other information collected included details on social and material circumstances such as where the participant lived at present, and whether they stayed with parents or not, whether they had medical aid or not, and whether they owned items such as electronic gadgets, a house/flat/apartment, and whether they had access to various forms of bank loans.

There was also a question, with five sub-items or questions, which dealt with issues of self-esteem and satisfaction with life.

The questionnaire also contained a section that enquired about the participants' knowledge, attitudes and behaviour practices around sexuality, HIV, and other social behaviour characteristics such as the use of alcohol, smoking and illicit drug use. This section also asked regarding the participants' HIV status, whether they are taking antiretroviral medication or not and how their particular institution treated, dealt with and provided support for people living with HIV.

For this study, we extracted all the information about the students from the original database and excluded information on staff as the focus of the study was on students only.

7.5.2 Outcome measure or variable

The outcome measure of this study was self-reported life satisfaction. Life satisfaction, in this study, was considered to represent global life satisfaction as opposed to satisfaction with a specific domain of an individual's life.

Respondents were asked to choose one of the following options (1) Strongly agree (2) Agree (3) Unsure (4) Disagree and (5) Strongly disagree, in response to the question "Do you agree or disagree with the following statement? - I am satisfied with the choice I have made in my life up to now". Those who chose strongly agree or agree were classified as those with life satisfaction while those who chose any of the remaining options were regarded as those without life satisfaction.

The methods used to assess life satisfaction can be divided in two ways. The first method is to use multiple item scales such as satisfaction with life scale (SWLS), perceived life satisfaction scale (PLSS), student's life satisfaction scale (SLSS), and multidimensional life satisfaction scale (MLSS). The second method is to use single item life satisfaction measure.

In this study, we have used the single-item life satisfaction measure to assess global life satisfaction of the students. There are two main reasons for choosing to use the single-item method in this study. Firstly, this is a secondary data analysis from a study that was done as a KABP study in HEIs. As a result, the original study was not done with life satisfaction assessment as one of its objectives and therefore the use of life satisfaction scales could not have arisen.

Secondly, a number of studies have demonstrated that single-item life satisfaction measures perform very similar to scales such as SWLS.[21,22] The results showed that single-item life satisfaction measures correlate very strongly with SWLS and with other domains of life such as health and affect.[21,22] There is evidence that supports the utilisation of single-item life satisfaction measures in large population studies as these measures have shown to be both reliable and valid.[21,22]

7.5.3 Predictor variables

Socio-demographic characteristics`

The demographic characteristics of the participants that were collected in this study included gender, race, age, marital status and country of origin. The demographic characteristics are important because they have been shown to be associated with the main outcome of this study, namely life satisfaction.

Gender had only two categories namely female and male. Race or ethnicity had four categories which are Black, White, Coloured and Asian. The racial categorisation of the study participants was done according to the groups as identified within the context of South Africa. The categorisation in this study was done exclusively for describing the characteristics of the participants within the South African context as this is relevant for exploring population phenomena.

Marital status had five categories which were not married, not married but living with partner, married and living with husband or wife, married but not living with husband or wife, and divorced or widowed. Country of origin had four categories which were South African, SADC region, rest of Africa region, and the rest of the world.

Socio-economic status

Wealth index: Consistent with the literature that suggests using multiple measures to capture indicators of socio-economic position along a person's life course,[19, 20] a material wealth index in this study was measured by asking the participants the question "Do you personally own or have any of the following? —a computer, a cell phone, a bicycle, a motorcycle or motor scooter, a car or property (house)? The respondents were also asked if they personally owned a home loan, a motor vehicle loan or a bank/student loan. The index scores from the question were derived by adding up the response options "No" (coded 0) or "Yes" (coded 1). The index scores were then ranked to classify the study participants into three categories, namely, the lowest, middle and highest wealth index tertiles.

Medical aid: The study respondents were asked if they were members of a medical aid scheme. The options for the participants who belonged to a medical aid scheme included having their own comprehensive medical cover, having hospital plan only, or covered by medical aid of guardian, parent, partner, husband or wife. The responses to this question were collapsed into two categories, (1) for "No" meaning that the participant does not belong to any medical scheme and (2) for "Yes" meaning that they are currently a member of a medical aid scheme.

Living condition

The living conditions of participants in this study were assessed by asking each participant whether they lived in an official campus residence, in a flat/apartment/house in the city or town, in a township/location, in a rural area/village, in an informal settlement, or on a farm. This item was meant to ascertain the participants' place of residence during the time of study.

Physical wellbeing

The physical condition of any individual is an important factor in their overall wellbeing. It is one of the critical domains of life satisfaction located within the health-related domain. The physical wellbeing is a reflection of an individual's current health status. Studies have shown that there is strong correlation between the current health status of an individual and their level of life satisfaction.[25, 26, 32]Studies have indicated a decline in the quality of life and life satisfaction of individuals with serious illness including chronic and incurable diseases.[25, 26, 46, 60, 61] The respondents were asked how many days they were absent from classes because of sickness.

Institutional support

Institutional support in the study was assessed by asking the participants the following questions: The first question was "If you discovered you were HIV positive, is there a place at this institution where you could go for help and support?" Options included 'No' and 'Yes'

The second question was "Do you agree or disagree with the following statement? The management of this institution takes HIV/AIDS seriously." Options were dichotomized as follows: Agree strongly/Agree =Yes and Unsure/disagree/disagree strongly =No.

Social support

Respondents were asked if they thought most of their friends at their institutions would support them if they told their friends that they had HIV. Options included Agree, strongly agree, unsure, disagree and disagree strongly. The responses were dichotomised as follows: Agree strongly/Agree =1 and Unsure/disagree/disagree strongly =0.

Self esteem

Self-esteem was assessed by asking the participants the following question: "Do you agree with the statement- I feel inferior to my friends." Options were dichotomized as follows: Agree strongly/Agree =1 and Unsure/disagree/disagree strongly =0.

Social habits

Social habits such as alcohol, tobacco, and illicit drug use are important variables in a number of significant ways. Firstly, taking up such social habits especially in the context of a serious illness such as HIV may be indicative of underlying psychological problems such as stress, anxiety, and depression. Secondly, the misuse of especially alcohol and illicit drugs may have played a role in the individual engaging in high risk behaviours that may have resulted in them being infected with HIV in the first place.

Alcohol use

Respondents were asked about their current use of alcohol and tobacco products. In section six of the questionnaire, the participants were asked about how frequently they drink alcohol beverages, visit taverns, bars, nightclubs, or shebeens where alcohol is served and episodes when they had been drunk in the last month.

Illicit drug use

Respondents were asked about current and history of illicit drug use. The participants were asked specifically if they had used any of the following substances marijuana, mandrax, ecstasy, cocaine, heroin, LSD, methamphetamines and methcathinone. They were also asked about the use of injectable drugs in the last twelve months with Yes = 1 and No = 2.

7.6 Data analysis

The data was analysed using STATA Release 12 (Stata Corporation, College Station, Texas, USA), with appropriate weighting of selection probabilities and taking into consideration the complex sample design used in the HEAIDS survey.

Descriptive statistical analysis was carried out to describe frequency distributions and characteristics of the study participants. Group differences were assessed using chi-square statistics for categorical variables. The variables that were found to be significantly associated ($p < 0.25$) with life satisfaction were selected for inclusion into initial multivariate analysis model. Multi-variable adjusted logistic regression analysis was carried out using a backward deletion approach to construct a model that contained variables that are associated with life satisfaction.

All statistical tests were two-tailed. The level of significance was set at $p<0.05$. Principal component analysis (PCA) was used to explore data reduction of the multiple items measuring wealth; alpha reliability test was then carried out to check for internal consistency.

7.6.1 Potential predictor variables identification

The initial stage in analysing the data in this study was to identify all possible predictor variables that have been shown to be associated with the outcome of interest namely self-reported life satisfaction. The identification of these variables was based on published literature on the concept of life satisfaction conducted under a variety of social contexts and not limited to higher education environment only.

7.6.2 The Chi square test

The chi square test is a measure of association that is used to examine differences between categories of an independent variable and a dependent variable measured on a nominal scale. It is used to test whether the numbers of individuals in different categories are consistent with a particular null hypothesis. The chi square test compares the observed frequencies in each category of the contingency table with the expected frequencies given that the null hypothesis is true. The test is utilised to determine whether the deviations between the observed and the expected counts are too large to be attributed to chance. If Pearson's chi

square is significant, the interpretation is that the two variables show a relationship that is larger than what would be expected by chance.[68, 69]

The outcome variable in this study was self-reported life satisfaction among students in HEIs in South Africa. One of the first elements was to determine if there was a difference in self-reported life satisfaction between HIV positive and HIV negative students in HEIs. Further analysis among the HIV positive students was to determine if demographic characteristics such as race, age, marital status, living conditions, and wealth index influence self-reported life satisfaction among the students.

7.6.3 Regression techniques

Regression is a statistical procedure whose main function is to attempt to predict the values of a given variable, (termed the dependent, outcome, or response variable) based on the values of one or more other variables (called independent variables, predictors, or covariates). The output of a regression exercise is usually an equation (or model) which summarises the relationship between the dependent and independent variable(s).[68, 69]

Typically, the model output includes summary statistics that describe how well the model fits the data, the amount of variation in the outcome accounted for by the model, and a basis for comparing the existing model to other similar models. By comparing these statistics across multiple models the user is able to determine a combination and order of independent variables that most satisfactorily predict the values of the outcome.[68, 69]

Since the focus of any regression modelling is on the dependent variable, the type of regression technique to be used is dictated or influenced by the type of dependent variable being analysed and the eventual analytic goal.

7.6.4 Logistic regression

In the case of survey data which has been collected under complex sample design, straightforward application of maximum likelihood estimation (MLE) procedures of logistic regression cannot be achieved. The complex sample designs usually used in most surveys renders some of the important assumptions that underlie the F tests or likelihood ratio tests used to compare alternative models invalid. Instead, Wald-type tests are often used to test hypothesis concerning the parameters of a specified logistic regression model.[68]

This important information regarding analysis of complex survey data is applicable in this study because the methodology of collecting the data during original HEAIDS study was considerably complex. The sampling methodology consisted of various stages from the institution level to the faculty, then to the departments within the faculties. In addition, there was the process of combining a number of faculties into faculty groups. So the sample weightings must take these steps into consideration and hence the conclusion that this satisfies the criteria for complex survey data.

The outcome variable in this study is a dichotomous or binary variable. Dichotomous or binary outcome variables are variables that can only take two possible outcomes which are mutually exclusive and only one must occur.[68, 69]Since the dependent variable is dichotomous, logistic regression which uses binomial probability theory in which there are only two values to predict was the most appropriate technique to use.[68, 69]The conventional coding for the outcome is usually such that "0" stands for if the event does not occur or failure while "1" stands for if the event does occur or success. The outcome of interest in this study was self-reported life satisfaction. The presence of life satisfaction was denoted as "1" and the absence of life satisfaction denoted as "0".

Logistic regression is intended for the modelling of dichotomous categorical outcomes.[68,69] It is a statistical regression technique that can be used to predict dichotomous outcomes from multiple predictor variables and focuses upon the relative probability (odds) of obtaining a given result category.[68,69] This regression modelling technique candemonstrate how variation in a binary outcome variable can be modelled to link the outcome to explanatory variables.[68,69] The value of logistic regression becomes apparent in the context of multiple levels in an explanatory variable or when faced with multiple explanatory variables. The logistic regression is thus able to determine the impact of multiple independent variables presented simultaneously to predict membership of either of the two dependent variable categories.[68,69]

<u>The two main uses of logistic regression are for:</u>

- prediction of group membership. Logistic regression calculates probability of success over the probability of failure. In essence, can the categories of the outcome variable

be predicted given a set of predictor variables? The results are in the form of an odds ratio.

- provision of knowledge of the relationships and strengths among the variables. This would give information on the relative importance of each predictor variable and possibly if there are any interactions among the predictor variables.

The assumptions of logistic regression are that:

- there is no assumption for a linear relationship between the dependent and independent variables.
- the dependent variable must be a dichotomy, meaning that there are only two categories.
- the independent variables need not be interval, nor normally distributed, nor linearly related, nor of equal variance within each group.
- the categories must be mutually exclusive and exhaustive. A participant can only be allocated to be a member of one of the two groups.
- larger samples are needed than for linear regression because maximum likelihood coefficients are large sample estimates.

Some of the conditions for performing logistic regression include the fact that there are no limitations to the number of simple dichotomous independent variables. The independent variables can include ordinal and continuous variables.[68, 69]

In the analysis of binary outcomes, the concern revolves around modelling the probability of the event occurring relative to the likelihood of an event not occurring. Logistic regression technique forms a best fitting equation or function using the maximum likelihood estimation (MLE) method. The MLE method maximises the probability of classifying the observed data into the appropriate category given the regression coefficients.

With regard to undertaking a logistic regression analysis process, Hosmer and Lemeshow have advised on a methodical process of specifying the initial model, refining the set of predictors and then determining the final form of the logistic regression model.[69] The process is incremental, sequential and logical covering a number of interrelated steps.[69]

The initial step involved performing initial bivariate analysis to ascertain the presence of an association between the outcome variable (self-reported life satisfaction) and individual predictor variable candidates. In this study this step entailed performing bivariate analysis of the relationship of life satisfaction among HIV positive participants and predictor variables such as age according to category, sex, race, marital status, type of dwelling and residential circumstances, support from friends, self-esteem, faculty group, graduate status, year of study, material wealth index factors such as having medical aid, having a home loan, having a motor vehicle or scooter, and perceived risk of physical harm and violent crime.

The initial step described in the paragraph above resulted in selection of predictor variables that had a bivariate association with the outcome variable at significance level of $p < 0.25$ as candidates for inclusion in the multivariate logistic regression model. In this study, the bivariate association was assessed using Pearson's chi square analysis.

The next step in the analysis entailed running the initial logistic regression model with all the candidate predictors selected. The individual predictor's contribution to the multivariate model was then evaluated using the Wald test.

Logistic regression output either provides a coefficient "b" or the adjusted odds ratios which measures each independent variable's partial contribution to variations in the dependent variable. The goal is to correctly predict the category of outcome for individual cases using the most parsimonious model. To achieve this goal, a model (i.e. an equation) is created that includes all predictor variables that are useful in predicting the response variable and summarises the relationship between the dependent and independent variables. The aim is to predict the probability that a participant will be a "1" rather than "0" from knowledge of relevant independent variables and coefficients and not a numerical value as in linear regression.

The model generated was accompanied by summary statistics describing how well the model fits the data, the amount of variation in the outcome accounted for by the model, and a basis for comparing the existing model to other similar models. For all methods, the contribution to the model is measured by the model chi square. The model chi square is a statistical measure of the fit between the dependent and independent variables.[68, 69]

The model output included estimates of the adjusted odds ratios, linearized standard error, t- statistic and its associated p value, and the 95% confidence interval. The t statistic in the output is commonly referred to as the student's t statistic and its p value have been shown to be equivalent to the Wald test and is important in evaluating each predictor variable's overall contribution to the model or importance as a predictor for the outcome variable.[68]

In this study we performed logistic regression to determine the independent variables that are significantly associated with the probability of HIV positive students in HEIs in South Africa reporting life satisfaction. The independent variables that were included in the model are demographic variables age, sex, race and marital status. Other independent variables of interest that were included in the logistic regression model are the socio-economic status of the participants determined by access to medical aid scheme, ownership of vehicle/bicycle/scooter, whether or not they have a home loan/bank loan/student loan. Additional independent variables used in the model were the level of social support, institutional support, physical wellbeing, level of self-esteem, the living condition, and the social habits such as the use of alcohol, smoking and illicit drug use.

A backward deletion approach of logistic regression was used. In this approach, the full model is fitted with all possible predictor variables. The significance level of each variable staying within the model was set at 0.05. The model was run and the variable with the lowest t-statistic or the highest P-value was then removed if it was above the level of significance. Following the elimination of the predictor variable with the highest p value, the model was then run again with removal of all variables that were above the level of significance until only variables that demonstrated significant association with outcome variable are left. This would be regarded as the final logistic regression model.

The backward deletion approach has the advantage of enabling a particular set of variables to have considerable predictive capability even though individually or as a subset may not have the same predictive capability.[68, 69]This effect would otherwise not be detected in the forward selection and stepwise regression approaches.[68, 69]

7.7 Ethical and legal considerations

- All the necessary and required steps expected in obtaining ethical approval for research studies were followed.
- Ethical approval was granted from the appropriate authorities. In this case the appropriate and relevant authority was the University of Pretoria, Faculty of Health Sciences Research Ethics Committee (See appendix 2)
- The information obtained for the study was handled according to all expected standards of ethical conducts required by the University of Pretoria.

8 RESULTS

8.1 Introduction

In order to address the aim and objectives of this study, prevalence of self-reported life satisfaction among the general student population was determined followed by estimate of the prevalence of life satisfaction specifically among students that are HIV infected and finally exploration of factors that are important in determining the probability that a particular HIV positive student will report being satisfied with their lives.

8.2 Demographic characteristics of participants

A total number of 17 062 students participated in the survey with females constituting 58.62% (10 001) and males 41.38% (7 061) of all participants. Table 1 below shows the demographic characteristics of the participants in terms of gender, race, age categories and countries of origin.

The majority of students in the study were South African between the ages of 18 and 24 years of age (88.71%; n=15 135) and were predominantly undergraduates (90.72%; n=14 818). Disaggregation by race indicated that most students were black Africans (69%) with the other three race groups constituting 31% combined. Among the participants, just over 93% were unmarried. By far the majority (93.13%) of participants were South African, followed by those from the SADC region at 3.98% and those from the rest of Africa region and other parts of the world constituted 2.23% combined.

Table 1: Demographic characteristics of the general student participants (N= 17 602)

Characteristics	Number of participants (n)	Percentage (%)
Gender		
Female	10001	58.62
Male	7061	41.38
Race/Ethnicity		
Black	11774	69
White	3112	18.24
Coloured	1560	9.14
Asian	616	3.62
Age categories		
18-24 years	15135	88.71
25-34 years	1617	9.48
35 years and older	310	1.82
Marital status		
Not married	15807	93.13
Not married, living with partner	528	3.11
Married, living with spouse	401	2.36
Married, not living with spouse	132	0.78
Divorced or widowed	105	0.62
Country of origin		
South Africa	16002	93.79
SADC region	679	3.98
Africa region	237	1.39
Rest of the world	143	0.84

The majority of students lived in either a flat in town or an official university residence during the time of study. Students who stayed in these two categories of student accommodation constituted 82.46% of the total participants. Those students who stayed in township, informal settlement, and rural or farm dwellings constituted 17.51% of the total participants.

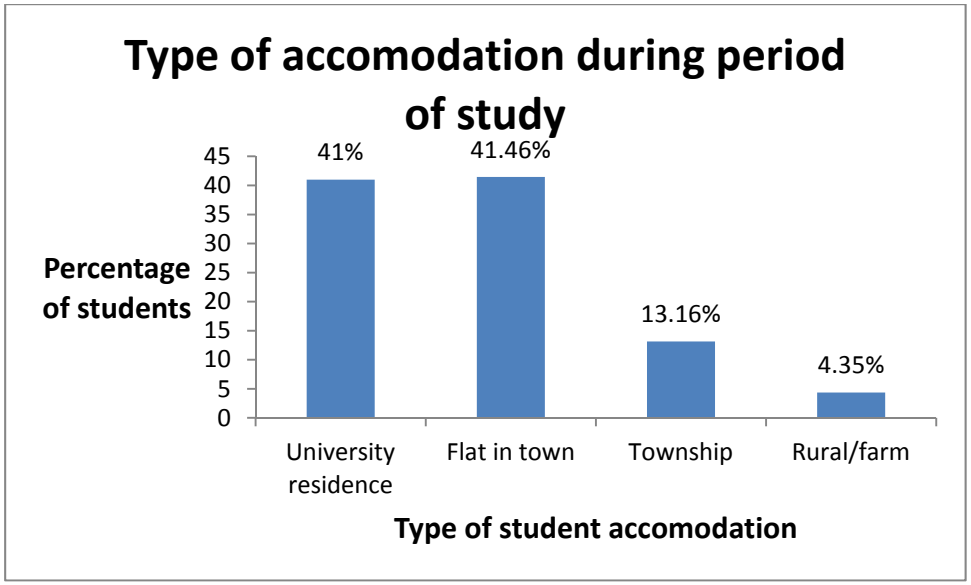

Figure 2: The type of accommodation that students used during the period of study

Figure 3 below shows the number of HEIs in each category that constituted the sampling frame or institutions from which the participants in the study were recruited from. All the 22 HEIs were in seven provinces with Northern Cape and Mpumalanga provinces having no higher education institutions.

The distribution of source institution, in terms of size and geographic location, is an important factor to consider as there are differences in demographic makeup of students in different institutions that may influence both the HIV prevalence, socio-economic status and institutional characteristics that may influence life satisfaction. The majority of historically black institutions fell within the small category while the historically white institutions were in the medium and large categories.

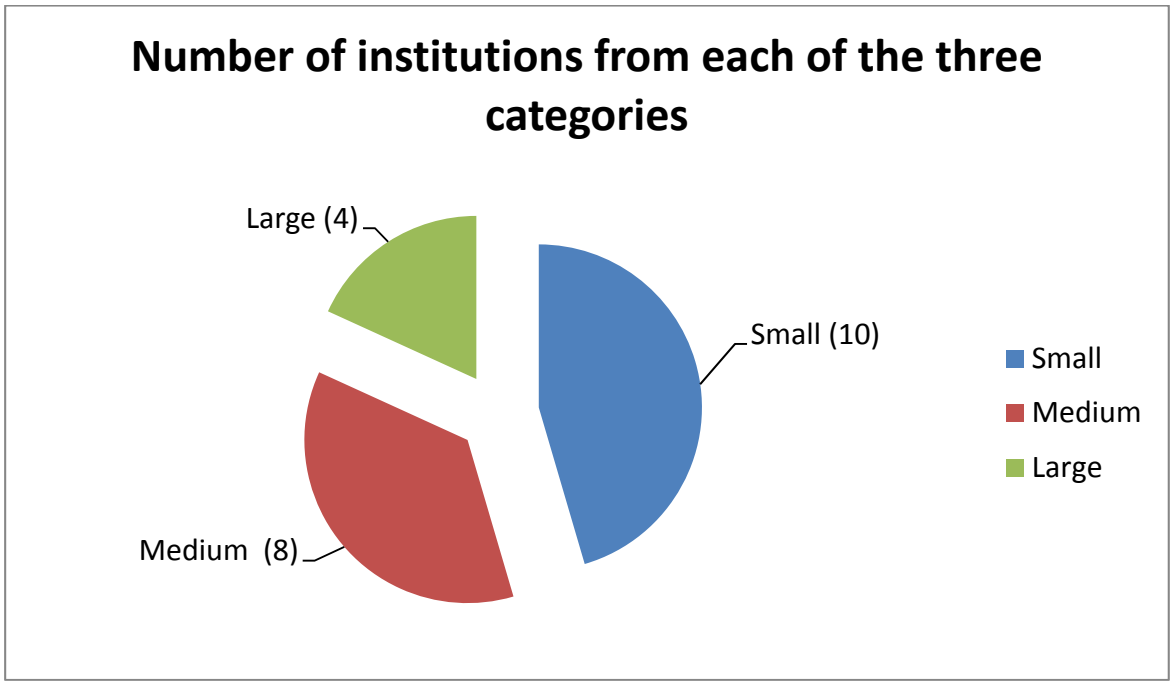

Figure 3: The type of source institutions for participants in the study according to size

Most of the students were from small and medium-sized institutions with combined percentage of 72.4%. The participants were evenly distributed among the three faculty groups with those studying for degrees or diplomas in natural sciences (36.70%) being only slightly more than the other two faculty groups. The undergraduate category, which refers to those who are studying for their first degree or diploma, constituted the majority of participants at 90.72%.

Table 2: Education characteristics of the general student participants (N= 17 602)

Characteristic		**Number of participants (n)**	**Percentage (%)**
Size of institution			
	Small	5869	34.4
	Medium	6848	38
	Large	4709	27.6
Faculty group			
	Law, Commerce	5483	32.14
	Humanities	5316	31.16
	Natural sciences	6261	36.70
Graduate status			
	Undergraduate	15478	90.72
	Postgraduate	1583	9.28

8.3 Life satisfaction among general student of population

The prevalence of life satisfaction among the general student population was found to be 79.54%. This observation suggests that, by far, the majority of students in HEIs in South Africa are happy or content with their current circumstances compared to 20.46% of students who reported not being satisfied with their lives.

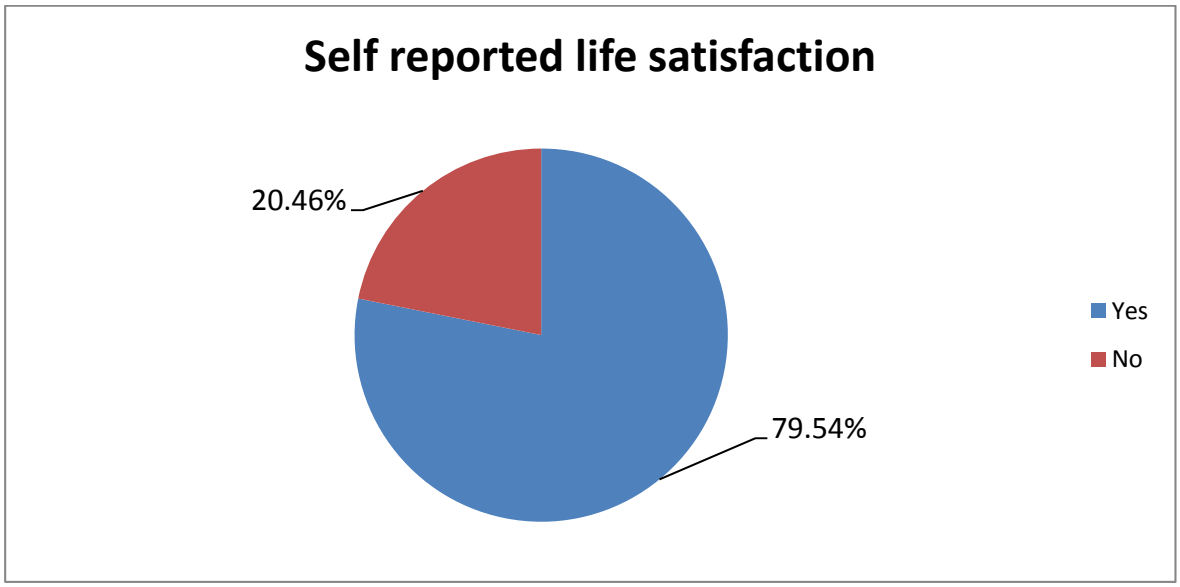

Figure 4: Self-reported life satisfaction among the general student population in HEIs in South Africa

A variety of predictor variables which have been shown, from published literature, to be associated with life satisfaction were considered in the analysis of life satisfaction in this study. Table 3 below show a comprehensive list of variables considered and classified into three major areas namely socio-demographic, socio-economic, and education-related characteristics.

Table 3: Predictor variables considered in the analysis of both the general and HIV positive students

Socio-demographic factors:	Material wealth index	Education, personal and institutional related factors:
1. Age	1. Owning a cell phone	1. Graduate status
2. Gender	2. Owning a computer	2. Full time versus part time
3. Race/Ethnicity	2. Owning a car	3. Field of study
4. Marital status	3. Owning a scooter	4. Year of study
5. Country of origin	4. Owning a bicycle	5. Number of years spent in the institution
	5. Having a student loan	6. Accommodation
	6. Having a bank loan	7. Social support
	7. Having a home loan	8. Self esteem
	8. Owning a property	9. Risk of physical harm
	9. Belonging to a medical aid scheme	10. Stigma

Among both gender groups, there were more students that were satisfied with life compared to those who were not. Among the three age categories, four race/ethnic categories, and five marital status categories there were more students who reported being satisfied with their lives compared to those that were not satisfied with their lives.

Table 4: Life satisfaction within categories of demographic variables among the general student participants

Characteristic		No of participants	Percentage
Gender			
	Female	7458	78.32
	Male	5416	80.10
Age			
	18-24 years	12358	78.84
	25-34 years	1281	82.04
	35 years and older	242	79.14
Race/Ethnicity			
	Black	8733	77.09
	White	2591	84.78
	Coloured	1126	96.82
	Asian	542	74.86
Marital status			
	Not married	12918	79.02
	Not married but living with partner	392	77.12
	Married and living with spouse	104	78.69
	Married but not living with spouse	332	85.54
	Divorced or widowed	75	76.21

A comparison of reported life satisfaction among the categories of each predictor variables was undertaken using Pearson's Chi square tests corrected for complex survey designs. The level of statistical significance was at p value less than 0.05.

Table 5 below also shows the predictor variables' association with the outcome variable of life satisfaction. The predictor variables that demonstrated statistically significant association with life satisfaction are race, gender, owning a car and owning a computer.

The difference in life satisfaction between male and female participants was only slight with proportionally higher percentage of male participants reporting being satisfied with life as compared to female participants. A chi square statistic calculated for gender was just significant with a p-value of 0.05.

Principal component analysis was carried out on the material wealth index measure to determine if there is correlation between some of the variables. The analysis did not reveal any redundancy among the variables and therefore they were retained in their original form with no need to create artificial principal components.

Two components of material wealth (socio-economic) index, owning a car and owning a computer indicate statistically significant association with life satisfaction among the general student population. The other components of the material wealth index do not exhibit a statistically significant association with life satisfaction.

Table 5: Prevalence of life satisfaction among the categories of predictor variables

Characteristic		%(n)	P-value
Race/Ethnicity			<0.001
	Black	77.40(8733)	
	White	85.33(2591)	
	Coloured	73.68(1126)	
	Asian	74.86(542)	
Gender			0.052
	Male	80.10(5416)	
	Female	78.32(7458)	
Age categories			0.09
	18-24 years	78.84(12358)	
	25-34 years	82.04(1281)	
	35 years and above	78.38(242)	
Marital status			0.15
	Not married	79.02(12918)	
	Not married but living with partner	77.12(392)	
	Married and living with spouse	78.69(104)	
	Married but not living with spouse	85.54(332)	
	Widowed or divorced	76.21(75)	
Material wealth index			
	Cell phone		0.07
	Yes	79.35(13030)	
	No	76.05(613)	
	Own a car		<0.001
	Yes	83.29(2850)	
	No	77.60(9930)	
	Own a computer		<0.001
	Yes	80.64(6509)	
	No	77.57(6469)	
	Having a student loan		0.40
	Yes	78.63(3772)	
	No	79.47(9157)	
	Having a home loan		0.41
	Yes	75.99(134)	
	No	79.32(13624)	
	Belonging to medical aid scheme		0.25
	Yes	79.67(6239)	
	No	78.63(6863)	

P values derived using Pearson's Chi-square statistic

Figure 5 below shows that among the four race groups, white students had the highest proportion (85.33%) of participants with life satisfaction compared to the other races. Although it should be emphasised that within all the race groups, there were more participants who reported being satisfied with life compared to those who were not satisfied with life.

A chi square statistic was calculated to examine if the difference in life satisfaction among the different racial groups is in fact statistically significant and not merely a finding as a result of chance. The chi square statistic had a p value of <0.001 which indicates that the difference between the racial groups is a true difference.

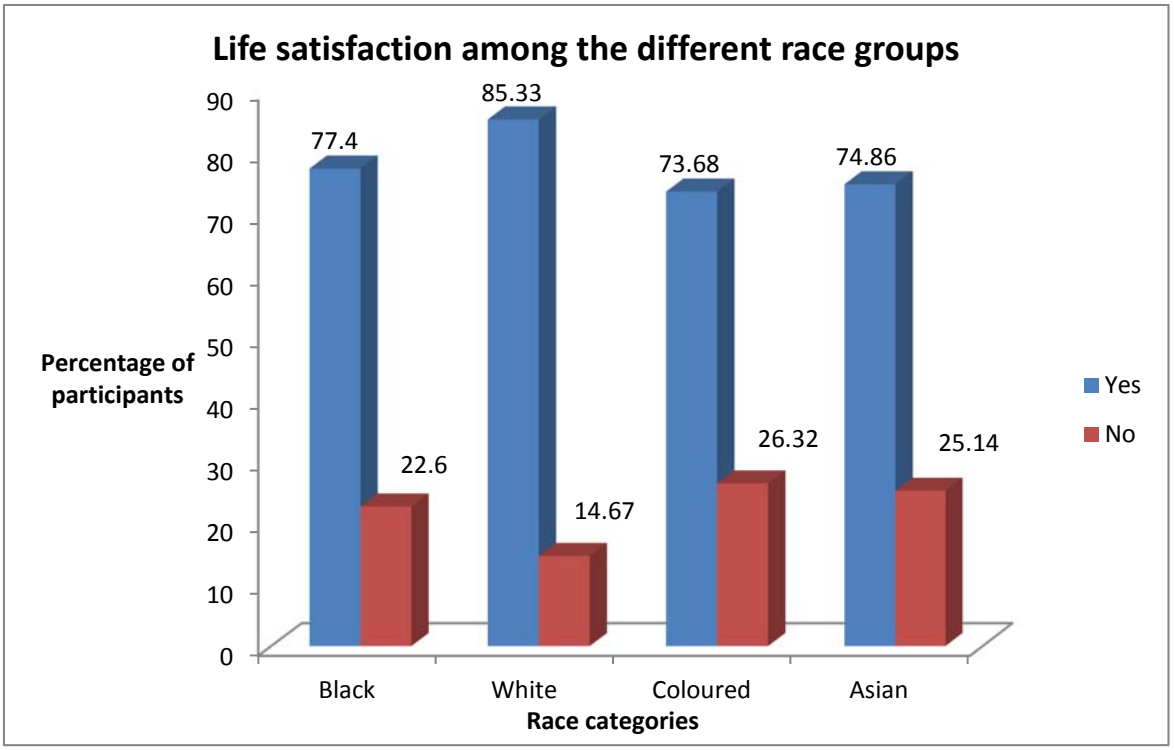

Figure 5: Percentage distribution of self-reported life satisfaction among the race/ethnic categories

Further chi square analysis for group differences of the education and related predictor variables such as field of study captured by faculty groups, graduate status captured by undergraduate and postgraduate status, study type captured by full-time or part-time status, and the type of accommodation was undertaken. Table 6 below indicates that these predictor variables were not important in predicting the probability of reporting life satisfaction among the general student population.

Table 6: Education and related predictor variables association with life satisfaction among the general student population

Characteristic		%(n)	P-value
Study type			0.06
	Full time	79.54(13482)	
	Part time	72.01(142)	
Graduate status			0.29
	Undergraduate	78.97(12170)	
	Postgraduate	80.51(1263)	
Faculty group			0.45
	Law and commerce	79.79(4210)	
	Humanities	78.44(4106)	
	Natural sciences	79.41(4849)	
Student accommodation			0.14
	University residence	79.48(5384)	
	Flat in town	79.00(5390)	
	Township	80.47(2228)	
	Rural/farm	77.61(83)	

8.4 HIV positive student population

8.4.1 Demographic characteristics of the HIV positive student population

The estimated HIV prevalence among the students in HEIs was found to be 3. 10% based on testing of DBS samples taken from the participants. The majority of the students were female, black, not married and South African. Just over 93% of the students were between the ages of 18 and 34 years.

Table 7: Demographic characteristics of the HIV positive student participants (N=494)

Characteristic	Number of participants (n)	Percentage (%)
Gender		
Female	361	76.65
Male	110	23.35
Race		
Black	485	98.35
White	1	0.21
Coloured	5	1.03
Asian	2	0.41
Age		
18- 24 years	290	58.70
25- 34 years	170	34.41
35 years and older	34	6.88
Marital status		
Not married	426	86.59
Not married but living with partner	20	4.07
Married and living with spouse	12	2.44
Married but not living with spouse	28	5.69
Divorced or widowed	6	1.22
Country of origin		
South African	479	96.38
SADC region	16	3.22
Africa	2	0.4
Rest of world	0	0

The majority of HIV positive students were registered for courses in the faculties of education, humanities and theology, followed by those in engineering and natural sciences. Over 90 per cent of students were in undergraduate studies with those in postgraduate programmes making just over five per cent.

Table 8: Education and related characteristics among HIV positive students (N=499)

Characteristic		No of participants (n)	Percentage (%)
Faculty group			
	Law, commerce	101	20.45
	Humanities	225	45.55
	Natural sciences	168	34
Graduate status			
	Undergraduate	465	94.13
	Postgraduate	29	5.87

8.4.2 Life satisfaction among HIV positive student population

Figure 6 below estimates life satisfaction among HIV positive students at 67.65%. The estimated prevalence shows that even among HIV infected students, there were more students that reported life satisfaction compared to those that were not satisfied with their lives. However, the estimated prevalence of life satisfaction among HIV positive students is below that of HIV negative students (67.65% versus 79.54%).

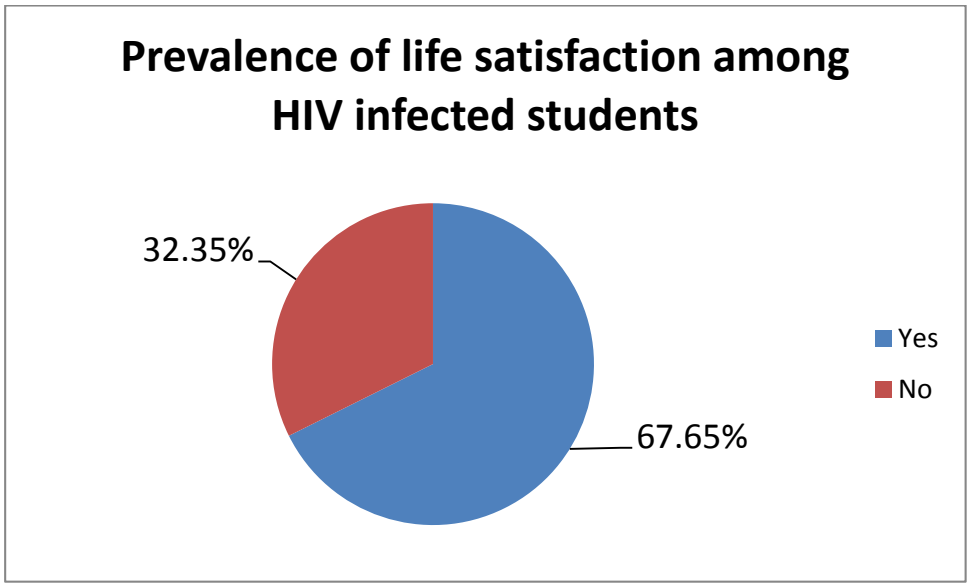

Figure 6: Self-reported life satisfaction among the HIV positive participants

The estimated prevalence of life satisfaction is comparable between the male and female students. Life satisfaction prevalence seems to be progressively increasing with age. Among the different race/ethnic groups, Black students seem to be more likely to report life satisfaction compared to the other race groups although prevalence of HIV is extremely low among the other race categories. Married students seem to report higher levels of life satisfaction compared to unmarried students.

Table 9: Prevalence of life satisfaction within different categories of the HIV positive student participants

Characteristic		No of participants	Percentage
Gender			
	Female	245	67.94
	Male	75	66.16
Age			
	18-24 years	186	61.18
	25-34 years	125	75.39
	35 years and older	25	79.46
Race/Ethnicity			
	Black	325	68.44
	White	1	100
	Coloured	1	9.82
	Asian	0	0
Marital status			
	Not married	282	65.08
	Not married but living with partner	13	65.28
	Married and living with spouse	9	80.97
	Married but not living with spouse	22	88.17
	Divorced or widowed	4	66.67

Figure 7 below demonstrates the difference in prevalence of life satisfaction between HIV positive and HIV negative students. A chi square test statistic was calculated to determine if the difference in life satisfaction between HIV negative and HIV positive groups was statistically significant or was possibly due to chance. The test was found to be 6. This result suggests that HIV infection has a potentially significant negative impact on the probability of a participant being satisfied with their lives.

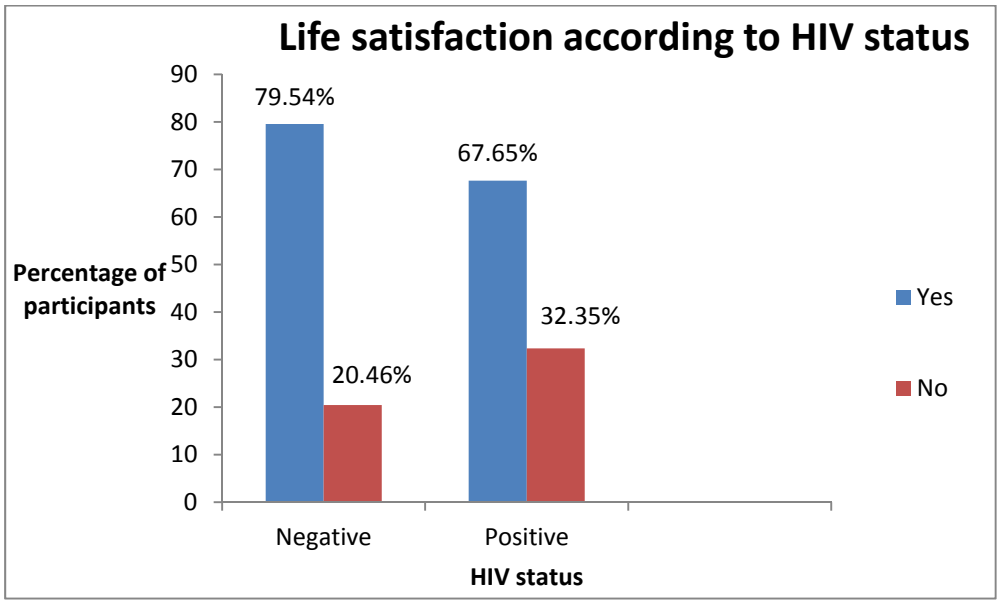

Figure 7: Difference in life satisfaction between HIV positive and negative participants

8.4.3 Predictors of life satisfaction among HIV positive participants: Bivariate analysis

A further analysis was undertaken to determine predictor variables with a statistically significant association with life satisfaction among the HIV infected students. A chi square test of association corrected for complex survey designs was done specifically among HIV positive participants with the level of significance set at p value equal to or less than 0.05.

Table 10 below shows that there were three predictor variables which demonstrated statistically significant association with life satisfaction. These three variables are race/ethnicity, age and marital status.

Among the HIV positive participants, there was no difference in reported life satisfaction between male and female students suggesting gender is not important in predicting the probability of being satisfied with life in this subpopulation.

There was also significant difference in life satisfaction among the age categories. Participants within higher age categories were more likely to report being satisfied with their lives in comparison to the lower age category as was seen in the general student population. Further, HIV positive black students were more likely to be satisfied with their lives compared to other race groups. However, the appropriateness of this result was initially invalidated because of extremely low observations of HIV positive participants from other race groups and as a consequence a Fisher's exact test was done confirming the chi square result.

Students who were married were more likely to report being satisfied with their lives compared to participants who were not married. This result suggests that being married is beneficial and is positively associated with probability of reporting life satisfaction.

The results also showed that factors which are components of material wealth index such as property ownership, motor vehicle ownership, having a home loan, and being a member of a medical aid did not show significant association with the probability of life satisfaction among the HIV positive participants.

Table 10: Predictor variables' bivariate association with life satisfaction among HIV positive participants

Characteristic		%(n)	P-value
Race/Ethnicity			0.02
Other racial groups		29.81(3)	
Black		68.75(333)	
Gender			0.78
Male		66.16(75)	
Female		67.94(245)	
Age categories			0.02
18-24 years		61.18 (186)	
25-34 years		75.39 (125)	
35 years and above		79.46 (25)	
Marital status			0.008
Not married		65.73(305)	
Married		86.44(31)	
Material wealth index			
	Cell phone		0.90
	Yes	68.04(305)	
	No	66.57(26)	
	Own a car		0.51
	Yes	72.98(32)	
	No	66.85(295)	
	Own a computer		0.18
	Yes	61.21(74)	
	No	69.56(255)	
	Having a student loan		0.64
	Yes	69.61(129)	
	No	66.79(199)	
	Having a home loan		0.43
	Yes	80.80(9)	
	No	67.67(323)	
	Owning a property		0.34
	Yes	74.29(42)	
	No	66.97(287)	
	Belonging to medical aid scheme		0.85
	Yes	67.89(90)	
	No	66.75(244)	

P values derived using Pearson's Chi-square statistic
Other racial groups- Whites, Coloureds, and Asians
Married- included married participants whether they were living with partner or not
Not married- included not married, not married but living with partner

There was no significant difference in proportions of HIV positive participants who reported being satisfied with their lives among the three faculty groups. There was also no significant difference in life satisfaction between undergraduate and postgraduate participants as well as between full time and part time participants. There was also no statistically significant difference in the prevalence of life satisfaction among students living in different types of student accommodation.

Table 11: Education and related predictor variables association with life satisfaction among the HIV positive student population

Characteristic		%(n)	P-value
Study type			0.48
	Full time	66.78(309)	
	Part time	53.39(9)	
Graduate status			0.78
	Undergraduate	67.52(315)	
	Postgraduate	70.39(21)	
Faculty group			0.18
	Law and commerce	73.99(69)	
	Humanities	69.13(159)	
	Natural sciences	59.48(108)	
Student accommodation			0.27
	University residence	69.15(182)	
	Flat in town	61.15(68)	
	Township	74.93(82)	
	Rural/farm	53.85(1)	

8.5 Logistic regression results

Logistic regression analysis was undertaken to predict the probability that a HIV positive participant would report life satisfaction. This probability would be predicted by various independent (predictor) variables that are hypothesised to have an impact on life satisfaction. The initial identification of possible predictor variables was from published literature on life satisfaction under different social circumstances in various parts of the globe. These predictor variables included demographic characteristics of participants, material wealth or socioeconomic index, access to social support and related social circumstances, social habits, living conditions, and education-related characteristics.

Following the bivariate association analysis, predictor variables that were selected for inclusion in the initial logistic regression model included race, age, marital status, faculty group, risk of physical harm, support from friends and owning a computer as shown in table 12 below.

Table 12: Results of predictor variables' bivariate analysis with the outcome variable using chi square test for possible inclusion into initial logistic regression model

Predictor variable	P value	Decision
Race	0.0229	**Include**
Gender	0.7817	Exclude
Marital status	0.0086	**Include**
Age	0.0155	**Include**
Faculty group	0.1788	**Include**
Graduate status	0.7886	Exclude
Year of study	0.8115	Exclude
Type of dwelling	0.2770	Exclude
Risk of physical harm	0.1294	**Include**
Self esteem	0.8048	Exclude
Social support	0.1238	**Include**
Stigma	0.5243	Exclude
Computer ownership	0.1784	**Include**
Student loan	0.6350	Exclude

* Variables included in initial model with p-value<0.25

The result of the logistic regression analysis identified race/ethnicity, age categories 2 (25-34yrs) and 3 (35years and older) were the only predictor variables making significant contribution to the model or as possible predictors for being satisfied with life. The other candidate predictor variables that did not exhibit significant contribution to the model were dropped using the hierarchical backward elimination method to construct a parsimonious model.

The final multivariate logistic model shown in table 13 below indicate that race/ethnicity and age are significantly associated with life satisfaction among HIV positive students in HEIs in South Africa.

The participants' age was captured or represented in the model as three grouped categories of age. Relative to the age category 1 (reference category), participants who are in the age category 2 have significantly higher (86%) odds of being satisfied with their lives when adjusting for other covariates. Furthermore, the odds of being satisfied with life among the participants are multiplied by 3.19 when one is 35 years and older compared to those in age category 1 when adjusting for other covariates.

Race or ethnicity was captured as dichotomous variable consisting of black and other. The category "other" consisted of White, Coloured and Asian participants. This dichotomisation of the race groups was because of the extremely low numbers of HIV positive participants within the White, Coloured and Asian participants. Relative to the black participants (reference category), the odds of being satisfied with life among HIV positive participants of other race groups are reduced by a factor of 0.16.

Table 13: The final logistic regression model of factors associated with life satisfaction among HIV positive students

Variable		Odds ratio (95% CI)	P value
Age			
	18-24 years	referent	
	25-34 years	1.85 (1.07 – 3.22)	0.027
	35 years and older	3.19 (1.08 – 9.41)	0.035
Race			
	Black	referent	
	Other	0.16 (0.04 – 0.60)	0.006

9 DISCUSSION

9.1 Introduction

This section will analyse, contextualise and interpret the findings of the study. The discussion starts by commenting on the estimated prevalence and factors that are associated with life satisfaction among the general student population. This is then followed by commentary on the prevalence and factors that impact on life satisfaction among HIV positive students. The final section is a discussion on the findings of regression techniques to identify factors that are associated with and possibly predictive of life satisfaction among HIV positive students in HEIs in South Africa.

9.2 HIV and life satisfaction

The prevalence of HIV among the participants was found to be substantially lower than the estimated prevalence in the general population (3.1% versus 10.9%). This result was not completely unexpected. Although HIV is widely recognised as a generalised epidemic in South Africa, meaning that it has spread beyond the recognised high risk populations into the general population, the prevalence of the disease is still different within different subpopulations.[1,5]

The student population in HEIs in South Africa is different from the general population in significant ways that would possibly explain the difference in prevalence of HIV between this sector and the general population.[1]The overall student HEI community is arguably demographically different in terms of race and socio-economic status than the general population of South Africa.[1]Although there has been a significant increase in enrolment of black students in HEIs since 1994, there were proportionally (relative to the overall South African population) more students from the white community and possibly from the Coloured and Asian communities in some of the HEIs than in the general population at that stage.[1] The issue of race and economic class, which in South Africa continued to mirror each other to some extent, means that the student population in some of the HEIs included in this study may have been substantially different from the general population and would thus affect the prevalence of HIV in this sector.[1]

Epidemiological studies have previously demonstrated the disproportionate burden of HIV/AIDS among poorer communities compared to economically well-off communities.[1, 5] Since students in HEIs may also be more likely to come from middle class backgrounds, this may have contributed to the relatively low HIV prevalence in this sector.[1,5]

On the other hand, there are factors that put students in HEIs at comparatively increased risk of acquiring HIV.[62, 75]Students in HEIs are in a period of their lives that is associated with high risk behaviours such as experimenting with substance use such as smoking, alcohol and illicit drug use. Illicit drugs and alcohol use or misuse have been shown to be associated with high risk sexual behaviours such as unprotected sexual intercourse and being involved with multiple partners.[36-39, 62, 66, 75] These factors may contribute to placing students in HEIs at relatively increased risk of HIV infection.

There were more HIV negative participants who reported life satisfaction compared to HIV positive participants (79.54% versus 67.65%). It should however be noted that even among the HIV positive participants, there were substantially more participants who reported being satisfied with life compared with those who were not satisfied with life (67.65% versus 32.35%).

The comparison between HIV uninfected and HIV infected participants in terms of life satisfaction prevalence indicated the difference to be substantial at 79.54% and 67.65% respectively, p = 0.000). This finding confirms that the difference between the two groups is more pronounced than would be explained by chance alone. This finding is probably due to the fact that HIV diagnosis remains a life changing disease with serious consequences for the infected individual both physically and psychologically. Such a diagnosis is more likely to impact negatively to the individual's wellbeing, quality of life and life satisfaction.

Further analysis among the HIV positive participants revealed that all the age categories had more participants that were more satisfied with their lives than those that were not. Furthermore, there were proportionally more participants among the higher age categories with self-reported life satisfaction compared with the lower age category. This finding suggests that the more advanced the age of the participants, the more they were likely to report being satisfied with their lives. This phenomenon may be due to the fact that older individuals are better equipped and able to handle adversity such as a diagnosis of a serious

chronic condition like HIV.[12, 15] Older individuals may also have access to more social support systems such as the family if they are married and therefore able to mobilise these systems when faced with challenging circumstances.[12, 15] All these factors may contribute to making older individuals more resilient in the face of HIV disease and increase the probability of being satisfied with life.

Marital status was one of the factors that showed an association with the higher likelihood of life satisfaction among HIV positive students. The married participants were more likely to report life satisfaction compared to those who are not married (86.44% versus 65.73%). The difference between the two groups was statistically significant with p value = 0.008. The reason for this may stem, firstly, from the fact that marriage is a source of social support in terms of the spouse and other members of the extended family structure. Secondly, married respondents are more likely to be older and therefore have developed coping strategies to enable them to withstand challenges of suffering from HIV disease. Finally, in the event of the participant having children, this may make the participant more determined to succeed and more optimistic about the future. It is however important to note that this relationship between life satisfaction and marital status may be influenced by age as a potential confounder.

Participants who engaged in anal sex were also less likely to be satisfied with life than those who did not engage in anal sex (53.51% versus 69.27%). This finding was found to be borderline significant in terms of statistical analysis with a p value of 0.0509. Anal sex is more often a feature of men who have sex with other men, commonly referred to as MSM, whether they are homosexual or bisexual.[56-58]This finding may potentially be an indication of additional stigma experienced by MSM within the HEI environment and in general which may have negative consequences for the quality of life and life satisfaction of these individuals.[67, 76]

9.3 Life satisfaction among the general student population

The results of this survey suggest that there were high levels of self-reported life satisfaction (79.54%) among the participants and by extension the general student population in HEIs in South Africa. It is important to be able to contextualise this finding about life satisfaction among this section of the population.

The first point to consider is the context of the higher education environment in South Africa. The higher education environment comprises mainly of universities, universities of technology, technical vocational education and training colleges and special colleges for nursing and teaching. All these institutions offer post matric education and training in various fields and at different levels.

The original HEAIDS survey was conducted among universities and universities of technology only. These are very expensive institutions of higher learning that would only be accessible to students from middle, upper middle, and higher income households. Students from poor households would not be able to afford the fees unless they were subsidised by private sector organisations or government agencies through bursaries, scholarships or student loans schemes.[17] It is, therefore, within this context that one would assume that a significant proportion of students in the study came from fairly economically stable backgrounds and as a result would be more likely to report being satisfied with their lives.[5, 17]

Another important factor to consider is the way in which the question was phrased. The question asked the participants whether they were satisfied with the choices they have made so far in their lives. Students in this study would have to have passed their matric very well to be accepted into these institutions and therefore it is understandable that the majority of them would be satisfied with what they have achieved so far in their lives and their decision to pursue further education. In addition, the HEI environment may potentially and relatively shield some of the students, especially those from poor and low middle income households, from some of the harsh realities in the real world such as poverty, risk of physical violence and sexual violence and may thus contribute to them being more likely to be satisfied with their lives compared to their counterparts in the general population.[17,18,24]

On the other hand, there are reasons that may negatively impact life satisfaction among students in the HEI sector. Internationally, students in HEIs have significant challenges such as academic requirements, financial challenges around funding their studies as well as other socio-cultural challenges that may potentially negatively impact on their satisfaction with life.[36-40]Hence, it is worth noting that although the majority of students were satisfied with their lives, there were still 20% of students who reported not being satisfied with their lives.

Students in HEIs in South Africa are expected to have similar challenges and therefore affect the proportion of students who report being satisfied with their lives. Students from poor and low middle income backgrounds may be faced with the situation where their education subsidies may not be adequate to cover all their needs in terms of tuition, books, training equipment, accommodation and living expenses.[36-40] In addition, some students may be enrolled in HEIs that are culturally very different from where they come from and having to adjust to this new environment may impact on their overall quality of life including satisfaction with their lives.[40]

Demographic characteristics

The demographic characteristics are important indicators of how representative of the general population this subpopulation is. Secondly, demographic characteristics have been shown to be associated with the main outcome of this study, namely life satisfaction.

Another finding was that there was no difference in self-reported life satisfaction between male and female participants with females seemingly more satisfied with their lives compared to their male counterparts (80.1% versus 78.32%) even though the difference was just barely statistically insignificant ($p = 0.0515$). This finding may reflect that there is no gender difference in the levels of life satisfaction among the general student population. However, the borderline significance of this finding suggests that gender may possibly be associated with the probability of being satisfied with life. This may be because females are more likely to seek support and assistance when necessary and maintain these support systems better than their male counterparts and this may ultimately influence their overall wellbeing and life satisfaction.

The racial or ethnic categorisation of the study participants was done according to the groups as identified within the context of South Africa. The categorisation in this study was done exclusively for describing the characteristics of the participants within the South African context as this is relevant for exploring population phenomena.

Among the general student participants, when disaggregated by race or ethnicity, there were still more participants who reported being satisfied with their lives in comparison to those that were not satisfied with their lives (85.33% among white students, 77.4% among black students, 74.86% among Asian students, and 73.68% among Coloured students). Of note was that among the race groups white participants had the highest proportion of participants who were satisfied with lives. This may possibly be due to the fact that white students are generally more culturally well-adjusted to the HEI environment, are more likely to have come from better schools and therefore better prepared for the rigours of university education, and are more likely to come from higher income households and consequently have a higher chance of being satisfied with their lives compared to students from other race groups.[17,18]

Socio-economic measures fall within the economic-related domain of life satisfaction. This domain encompasses aspects of an individual that relates to their material circumstances. This includes measures such as housing and living conditions, income of the individual or the household, the purchasing power of that income, as well as the financial solvency of the individual.[19, 20]

Socio-economic conditions have been shown to impact on the overall wellbeing including life satisfaction of individuals.[15, 19, 20] Evidence suggests that people from higher socio-economic class or with better material resources tend to report higher levels of life satisfaction.[19, 20, 23]

The material wealth (socio-economic) index in this study was a composite index made up of indices such as having access to medical aid cover, ownership of property, ownership of computer and/or mobile phone, having a motor vehicle or scooter, and having access to a home loan or student loan.

For the purpose of this study, belonging or being a member of a medical aid scheme was considered to be one of the indicators of the individual's or family's financial circumstances. This is based on the premise that, in South Africa, one has to have significant monthly income

to be able to afford monthly contributions to a medical scheme as the monthly premiums for medical scheme membership are relatively high. The wealth index measure is considered to be an indirect measure of an individual or household income.

Among the general student population, the results did not demonstrate an association between socio-economic status and life satisfaction. This finding was contrary to what one would expect as financial or economic status is one of the domains of life that are known to impact on the overall wellbeing of individuals globally. The possible explanation for this finding may be that students view other factors such as academic achievement and social circumstances within the university environment as more immediate and important than their extended material circumstances in terms of their family circumstances. It may also be because students in the HEIs are more optimistic about prospects for the future and even if they come from economically disadvantaged background they see higher education as a way of changing their material circumstances.

However, two components of material wealth index, namely ownership of a computer and car demonstrated an association with life satisfaction. These results suggest that certain material possessions may potentially play a significant role in determining life satisfaction among students in HEIs in South Africa and this is consistent with international findings.

Living conditions or circumstances of an individual is an important factor in overall wellbeing of an individual. It is located within the economic-related domain of life satisfaction. There is evidence in literature to suggest that those who live under unfavourable circumstances such as poor housing infrastructure, overcrowded environments and with limited access to amenities such as water, sanitation, and electricity tend to report lower levels of life satisfaction.[23, 24]The majority of students in the study lived in university residences or flats in town and therefore living condition of students was generally presumed to be satisfactory and therefore likely to contribute to the levels of life satisfaction among these students.

9.4 Predictors for life satisfaction

The initial identification of all the possible predictor (independent) variables were identified from published literature on life satisfaction in the higher education environment as well as in the general population in many countries around the world. The predictor variables

included demographic characteristics, socio-economic factors such as employment status, material wealth and living condition, self-esteem, social habits such as use of alcohol and illicit drugs, and social circumstances such as access to social services and personal security. These predictor variables fall within the quality of life dimensions that have been identified as important in determining the overall quality of life as well as life satisfaction.[7, 9,10]

These predictor variables, although identified mostly from literature in other parts of the world, were applicable and relevant to the South African context and were therefore justifiable in including them in the analysis of life satisfaction in this study. The predictor variables identified also fitted well within the domains of life and would therefore be both plausible and consistent with the current knowledge about life satisfaction. [7, 9, 10]

In the end, the final logistic regression model identified race, age category "25-34 years" and age category "35 years and older" as the most significant predictors of life satisfaction among HIV positive participants. This finding does not necessarily imply that the predictor variables that were not in the final model do not play any meaningful role in life satisfaction among HEI students. It simply implies that when rigorous statistical analysis is applied, these three variables were the ones that were consistently important in predicting the likelihood that an HIV positive participant would report being satisfied with life. It is also possible that a follow up study designed specifically for assessing quality of life and factors that are associated with life satisfaction among HIV positive students in HEIs may reveal other factors that are significantly predictive of life satisfaction.

The finding that participants of other race groups have significantly reduced odds of reporting life satisfaction compared to the black participants, when adjusting for other covariates, might be as a result of the fact that these students come from a social environment where HIV prevalence is so low that the impact of this diagnosis is enormous. Furthermore, their social support systems in terms of family and friends may therefore not be able or have the experience of dealing with HIV diagnosis. The other potential reason may be that this finding is in fact influenced by the very low numbers of HIV infection among the other race groups in comparison to black participants.

The respondents in the higher age categories have significantly higher odds of reporting life satisfaction establishing age as an important factor in the chance of being satisfied with life. This is most probably the result of older participants' maturity and therefore having an established array of skills, strategies and techniques to deal with adversity and life threatening situations such as an HIV diagnosis. Older participants are also more likely to have other reasons in their lives that make them more optimistic about the future and to correctly contextualise the challenge of HIV infection. These older students may be married or have children or have long term financial commitments such as home loans and even employment prospects that may make them more likely to have a positive outlook on life and therefore more likely to be satisfied with their lives.

10 LIMITATIONS OF THE STUDY

Life satisfaction as a concept and as an outcome was not one of the objectives of the original study. However, there was a question in the original questionnaire that asked the participants whether they were satisfied with the choices that they have made in their life so far. This was a single question and was the only one that was related to life satisfaction. This question was then identified and extracted as a single item measure of life satisfaction among the participants that took part in the study. Other factors that may have an impact on life satisfaction were not adequately explored.

Although the issue of single item life satisfaction was identified as a possible limitation in this study, it is worth mentioning that, in fact, single item life satisfaction evaluation is a well-accepted method of assessing life satisfaction. There are studies that have conclusively shown that single item life satisfaction measurements are comparable to multi-item life satisfaction scales in terms of validity and reliability in assessing life satisfaction in populations.[21, 22]

Another important limitation was the way in which the life satisfaction single item question was phrased. The question asked participants about how satisfied they were about the choices they have made so far in the lives. Participants who may not have reflected deeply on this question may simply have considered it to have been a question about decision to pursue studies in HEIs rather than as a reflection of their overall current life circumstances in relation to what they thought their circumstances ought to be. Although the question is adequate for assessment of life satisfaction, [21, 22] if the question was posed differently it may have affected how participants would respond to it.

11 CONCLUSION AND RECOMMENDATIONS

Overall wellbeing, quality of life and life satisfaction are increasingly becoming important clinical endpoints and outcomes in the context of chronic diseases. HIV/AIDS is now a recognised chronic disease and therefore the importance of subjective wellbeing of HIV infected individuals cannot be overemphasised. The HEI sector in South Africa should and can play an important role in ensuring that HIV infected students are sufficiently supported to improve their wellbeing and quality of life and thereby increase the likelihood of successfully completing their studies.

This study has shown that there is a difference in life satisfaction between HIV infected and uninfected students with HIV positive students more likely to report not being satisfied with their lives. Students who are young and unmarried are at most risk of not being able to cope with the devastation of being diagnosed and living with HIV and as a result are less likely to be satisfied with their lives. It is, therefore, important that programmes must be designed to respond to the psychological needs of HIV positive students and especially the younger students between the ages of 18 and 24 years of age. The programmes to be designed and implemented must not only address the issue of physical wellbeing but must also include psychological support and promote life skills to ensure the overall holistic wellbeing of students.

The HEI sector also need to realise that HIV is now a generalised epidemic and all programmes designed to combat the disease in the HEI sector must include all students and even categories of students who might previously have been regarded as low risk such as White, Coloured and Asian students. This recommendation is supported by the fact that among HIV positive students, those from the other race groups (White, Coloured and Asians) are less likely to report being satisfied with their life compared to African black students.

This was a legitimate and scientifically sound decision to investigate the concept of life satisfaction among students in the HEI sector and especially those living with HIV. Life satisfaction is a component factor of the overall concept of the quality of life of individuals which has been identified and recognised as an important aspect of overall wellbeing of individuals. Both quality of life and life satisfaction are relevant within the context of students in HEIs in general and also within the realm of HIV infection as a chronic condition.

Recommendations regarding implementation of programmes that will address psychological wellbeing and life skills among students living with HIV will be submitted to the HEAIDS programme so that these findings can be forwarded to the entire HEI sector. The recommendations will be an important addition to the current strategies that the HEIs may be implementing to mitigate the impact of HIV within this sector.

It is important, however, that the HEI sector responses to HIV are based on evidence of factors that are important in influencing and determining the quality of life of students including life satisfaction. This study has identified a number of socio-demographic factors that are associated with life satisfaction in this sector and will hopefully assist in developing comprehensive programs to assist HIV infected students.

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APPENDIX 1

HEAIDS
HIGHER EDUCATION HIV/AIDS PROGRAMME

A SURVEY OF HIV / AIDS IN HIGHER EDUCATION IN SOUTH AFRICA

education
Department:
Education
REPUBLIC OF SOUTH AFRICA

Funded under the European Programme for Reconstruction and Development

HESA
HIGHER EDUCATION SOUTH AFRICA

The Higher Education HIV/AIDS programme is an initiative of the Department of Education undertaken by Higher Education South Africa. It is funded by the European Union under the European Programme for Reconstruction and Development in terms of a partnership agreement with the Department.

STUDENT MODULE

Only answer this questionnaire if you are a
REGISTERED FULL-TIME OR PART-TIME STUDENT

This questionnaire is confidential and you are not required to include your name or any identifying information in your responses.

00004371

PLEASE ANSWER ALL QUESTIONS

MARKING INSTRUCTIONS	
• Use the HB pencil supplied. • Make solid marks that fill the circle completely. • Make no other marks on this form.	CORRECT: ● INCORRECT: ✓ ✗ ◒ ◔

1.1	Mark today's date	1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 ○ 8 ○ 9 ○ 10 ○	11 ○ 12 ○ 13 ○ 14 ○ 15 ○ 16 ○ 17 ○ 18 ○ 19 ○ 20 ○	21 ○ 22 ○ 23 ○ 24 ○ 25 ○ 26 ○ 27 ○ 28 ○ 29 ○ 30 ○ 31 ○	January ○ February ○ March ○ April ○ May ○ June ○ July ○ August ○ September ○ October ○ November ○ December ○		2008 ○ 2009 ○

1.2	Mark the time of this session	Before 7h00 ○ 1	7h00 - 7h59 ○ 2	8h00 - 8h59 ○ 3	9h00 - 9h59 ○ 4	10h00 - 10h59 ○ 5	11h00 - 11h59 ○ 6	12h00 - 12h59 ○ 7	13h00 - 13h59 ○ 8	14h00 - 14h59 ○ 9	15h00 - 15h59 ○ 10	16h00 - 16h59 ○	17h00 - 17h59 ○	18h00 - 18h59 ○	19h00 or later ○

1.3	Please mark your sex	Male ○ 1	Female ○ 2

1.4	Please mark your age	16 or younger ○ 1	17 ○ 2	18 ○ 3	19 ○ 4	20 ○ 5	21 ○ 6	22 ○ 7	23 ○ 8	24 ○	25 ○ 10	26 ○ 11	27 ○ 12	28 ○ 13	29 ○ 14	30 ○ 15	31 ○ 16	32 ○ 17	33 ○ 18	34 ○ 19	35 ○ 20	36 ○ 21	37 ○ 22	38 ○ 23	39 ○ 24	40 ○ 25	41 ○ 26	42 ○ 27	43 ○ 28	44 ○ 29	45 ○ 30	46 ○ 1	47 ○ 2	48 ○ 3	49 ○ 4	50 ○ 5	51 ○ 6	52 ○ 7	53 ○ 8	54 ○ 9	55 ○ 40	56 ○	57 ○	58 ○	59 ○	60 ○	61 ○	62 ○	63 ○	64 ○	65 ○ 50	66 ○	67 ○	68 ○	69 ○	70 ○	71 ○	72 ○	73 ○	74 ○	75+ ○

1.5	Please mark your race group	Black ○ 1	White ○ 4
		Indian ○ 2	Other ○ 5
		Coloured ○ 3	

1.6	What is your religion?	Catholic ○ 01	Muslim ○ 6
		Protestant ○ 02	Other faith ○ 7
		Other Christian denomination ○ 03	Traditional ○
		Jewish ○ 04	No specific religion ○
		Hindu ○ 5	No religion ○

1.7	What is your marital status?	Not married ○ 1
		Not married, but living with partner ○ 2
		Married, living with husband / wife ○ 3
		Married, NOT living with husband / wife ○ 4
		Divorced / Widowed / Other ○ 5

PLEASE CHECK THAT YOU HAVE ANSWERED ALL QUESTIONS BEFORE MOVING ONTO THE NEXT PAGE

1.8	What is your faculty / school / field of study?	Business / Commerce (1)	1 ○	Science	7 ○
		Education	2 ○	Medicine	8 ○
		Humanities, Arts or Social Sciences	3 ○	Dentistry	9 ○
		Law	4 ○	Allied Health Sciences	10 ○
		Engineering	5 ○	Agriculture	11 ○
		Technology	6 ○	Other :	○

		Undergraduate		Postgraduate	
1.9	What is the qualification you are studying for?	Baccalaureus technologiae degree	01 ○	Honours degree	08 ○
		General Acad.1st Bach. degree	02 ○	Magister technologiae degree	09 ○
		Professional 1st Bach degree 3 years	03 ○	Masters degree	10 ○
		Professional 1st Bach. degree 4 years	04 ○	Masters diploma in technology	11 ○
		Undergrad. Dip or Cert (1 or 2 years)	05 ○	Post Graduate Dip. or Cert.	12 ○
		Undergrad.Dip or Cert (3 yrs)	06 ○	Post grad. Bachelors degree	13 ○
		Other:	07 ○	MBBCh or other medical	14 ○
				Doctor technologiae degree	15 ○
				PhD / Doctoral degree	16 ○
				Other:	○

1.10	What is your year of study for the degree / diploma / certificate for which you are currently registered?	First year	1 ○
		Second year	○
		Third year	○
		Fourth year	○
		Fifth year	○
		Sixth year or more	6 ○

1.11	Are you currently registered for full- time or part-time Study?	Full-time	○
		Part-time	○

1.12	How many years have you completed as a student at this institution?	Less than one	1 ○	Six	7 ○
		One	2 ○	Seven	8 ○
		Two	3 ○	Eight	9 ○
		Three	4 ○	Nine	10 ○
		Four	5 ○	Ten	11 ○
		Five	6 ○	More than ten	12 ○

1.13	Please mark the name of your University	Cape Peninsula University of Technology (CPUT)	M	1 ○
		Central University of Technology (CUT)	M	2 ○
		Durban University of Technology (DUT)	HB M	3 ○
		Mangosuthu Technikon (MT)	HB	4 ○
		Nelson Mandela Metropolitan University (NMMU)	M	5 ○
		North West University (NWU)	BLK M	6 ○
		Rhodes University (RU)	W	7 ○
		Stellenbosch University (SU)	White W	8 ○
		Tshwane University of Technology (TUT)	M	9 ○
		University of Cape Town (UCT)	W	10 ○
		University of Fort Hare (UFH)	BLK HB	11 ○
		University of Johannesburg (UJ)	M	12 ○
		University of KwaZulu-Natal (UKZN)	M	13 ○
		University of Limpopo (UL)	BLK HB	14 ○
		University of Pretoria (UP)	W	15 ○
		University of South Africa (UNISA)		16 ○
		University of the Free State (UFS)	W	17 ○
		University of the Western Cape (UWC)	HB	18 ○
		University of Venda (UNIVEN)	BLK HB	19 ○
		University of Witwatersrand (WITS)	W	20 ○
		University of Zululand (UNIZUL)	BLK HB	21 ○
		Vaal University of Technology (VUT)	BK M	22 ○
		Walter Sisulu University (WSU)	BK HB	23 ○

PLEASE CHECK THAT YOU HAVE ANSWERED ALL QUESTIONS BEFORE MOVING ONTO THE NEXT PAGE

1.14 How old were you when your first child was born?

Not applicable, I do not have any children						01
15 or younger 02	26 13	36	46	56	66	
16 03	27 14	37	47	57	67	
17 04	28	38 28	48	58	68	
18 05	29	39	49	59	69	
19 06	30	40	50	60	70	
20 07	31	41	51	61	71	
21	32	42	52	62	72	
22	33	43	53	63	73	
23	34	44	54	64	74	41
24	35 22	45 32	55 42	65 53	75+	42
25 17						

10 10 10 10 10

1.15 Are you a South African citizen or permanent resident or from another country / region?

South African citizen or permanent resident	1
Namibia / Botswana / Zimbabwe / Mozambique / Lesotho / Swaziland	2
Uganda, Tanzania, Kenya, Malawi, Zambia	3
Congo, DRC, CAR, Rwanda, Burundi	4
Other sub-Saharan African country	5
North Africa / Middle East	6
Europe / Eastern Europe	7
Asia	
Australasia	
North America	
South America	

1.16 Do you personally own or have any of the following? (Answer all questions a-i)

	Yes (1)	No (2)
a) Bicycle		
b) Motorcycle / Motor scooter		
c) Motor car / Motor vehicle		
d) Cellphone		
e) Computer / laptop		
f) Own a house / flat / apartment		
g) A home loan		
h) A motor vehicle loan		
i) A bank loan / Student loan		

1.17 Do you have medical aid?

No	1
Yes, I have my own medical aid (comprehensive cover	2
Yes, I have my own medical aid (hospital plan)	3
Yes, I am covered by the medical aid of my parent / guardian / partner / husband / wife	4

1.18 Where do you live at present?

In an official campus residence	1
In a flat, apartment, or house in this city / town	2
In a township / location	3
In a rural area / village	4
In an informal settlement	5
On a farm	6

1.19 Do you live with your parents?

Yes	1
No	2

PLEASE CHECK THAT YOU HAVE ANSWERED ALL QUESTIONS BEFORE MOVING ONTO THE NEXT PAGE

1.20	In the PAST MONTH, how many days have you been absent from classes because you were sick?	1 ○	5 ○	9 ○	13 ○
		2 ○	6 ○	10 ○	14 ○
		3 ○	7 ○	11 ○	15 ○
		4 ○	8 ○	12 ○	More than 15 ○

1.21	Are you employed as a lecturer at this institution?	Yes	○
		No	○

1.22	Are you employed as a tutor, graduate assistant, or mentor at this institution?	Yes	○
		No	○

1.23	How many courses are you registered for this term?	1	○	4	○	7	○
		2	○	5	○	8	○
		3	○	6	○	More than 8	○

2.1	Have you had any of the following happen to you IN THE PAST 12 MONTHS? (Answer all questions a-e)	Yes	No
a)	Someone I know personally has told me that they are HIV positive	○	○
b)	Someone I know personally has died of AIDS	○	○
c)	I know of a student or staff member at this institution who has died of AIDS	○	○
d)	I have provided care to an HIV positive child or adult in my household	○	○
e)	I have missed classes or work to attend a funeral of a person who has died of AIDS	○	○

2.2	Have you had any of the following happen to you in the PAST 12 MONTHS? (Answer all questions a-f)	Yes	No
a)	I have attended a meeting or function about HIV / AIDS at this institution	○	○
b)	I have received information in the form of leaflets or booklets about HIV / AIDS at this institution	○	○
c)	I have obtained free condoms at this institution	○	○
d)	I have worn a t-shirt, cap, red ribbon or other item of clothing with an AIDS message at this institution	○	○
e)	I am a member of an HIV / AIDS club or organisation at this institution	○	○
f)	I have been involved in conducting HIV / AIDS research while I have been a student or have been working at this institution	○	○

2.3	If you discovered you were HIV positive, is there a place at this institution where you could go for help and support?	Yes	No	Don't Know
		○	○	○

2.4	Do you agree or disagree with the following statements? (Answer all questions a-f)	Agree Strongly	Agree	Unsure	Disagree	Disagree Strongly
a)	I feel safe from physical harm at this institution	○	○	○	○	○
b)	Female students are safe from sexual harassment at this institution	○	○	○	○	○
c)	Violent crime where people are physically injured is a serious problem at this institution	○	○	○	○	○
d)	The management of this institution take HIV/AIDS seriously	○	○	○	○	○
e)	The student leaders of this institution take HIV/AIDS seriously	○	○	○	○	○
f)	There should be more emphasis on HIV/AIDS in academic classes at this insitution	○	○	○	○	○

PLEASE CHECK THAT YOU HAVE ANSWERED ALL QUESTIONS BEFORE MOVING ONTO THE NEXT PAGE

2.5 Do you agree or disagree with the following statements? (Answer all questions a-e)	Agree Strongly	Agree	Unsure	Disagree	Disagree Strongly
a) It worries me that I am less wealthy than my friends					
b) I am satisfied with the choices I have made in my life up to now					
c) When I am in a group, I express my opinion easily					
d) I feel inferior to my friends					
e) I live by my own standards					

3.1 Are the following statements true, false or are you not sure? (Answer all questions a-f)	True	False	Not Sure
a) The more sexual partners you have, the more likely it is you will be infected with HIV			
b) You can be infected with HIV by touching a person who is HIV positive			
c) A mother can pass HIV onto her baby through breastfeeding			
d) If a person is raped, there are drugs available that can prevent HIV infection			
e) It is against the law for a girl younger than 16 to have sex with a much older man, even if she agrees to it			
f) There are drugs available called antiretrovirals that can help people with HIV / AIDS live longer			

3.2 Do you agree or disagree with the following statements? (Answer all questions a-g)	Agree Strongly	Agree	Unsure	Disagree	Disagree Strongly
a) It is a waste of money to provide further education to someone who is HIV positive					
b) If I told my friends at this institution that I had HIV, most of them would support me					
c) If a teacher has HIV but is not sick, she/he should be allowed to continue teaching					
d) I believe that it is acceptable to have a one - night stand					
e) It is acceptable to me for a man to have more than one girlfriend at a time					
f) It is acceptable to me for a woman to have more than one boyfriend at a time					
g) I believe it is acceptable for students to have sex for money to support their studies					

4.1 In the past 12 MONTHS, have you engaged in any of the following? (Answer all questions a-c)			
a) Oral sex	Yes, with a male partner	1	No 3
	Yes, with a female partner	2	
b) Anal sex	Yes, with a male partner	1	No 3
	Yes, with a female partner	2	
c) Intimate touching of the penis or vagina	Yes, with a male partner	1	No
	Yes, with a female partner	2	

4.2 Have you ever had penetrative sex before? (For the purpose of this survey, penetrative sex is defined as the penis entering the vagina or anus of a person of the opposite or same sex as yourself)	
	Yes
	No

4.3 How old were you when you first had penetrative sex?			
Younger than 10	1	19	11
10	2	20	12
11	3	21	13
12	4	22	14
13	5	23	15
14	6	24	16
15	7	25	17
16	8	Older than 25	18
17	9	Not applicable - I have not had penetrative sex before	19
18	10		

PLEASE CHECK THAT YOU HAVE ANSWERED ALL QUESTIONS BEFORE MOVING ONTO THE NEXT PAGE

4.4 Did you use a condom the last time you had penetrative sex?	Yes ○	No ○	Not applicable, I have not had penetrative sex before ○	
4.5 Was the person you most recently had penetrative sex with ten or more years older or younger than you?	No ○	Yes, ten or more years older than me ○	Yes, ten or more years younger than me ○	Not applicable, I have not had penetrative sex before ○
4.6 Was the person you most recently had penetrative sex with more or less wealthy than yourself?	About the same ○	Less wealthy ○	More wealthy ○	Not applicable, I have not had penetrative sex before ○

4.7 Was the person you last had penetrative sex with from this institution?	Not applicable, I have not had penetrative sex before	○
	No, they are not from this institution	○
	Yes, they are my husband / wife who is at this institution	○
	Yes, they are a student at this institution	○
	Yes, they are a member of academic staff at this institution	○
	Yes, they are a member of the administrative staff at this institution	○
	Yes, they are a cleaner, gardener, security guard, member of catering staff or other service staff at this institution	○

4.8 In the past 12 MONTHS, have you had penetrative sex?	Yes ○	No ○	Not applicable, I have not had penetrative sex before ○

4.9 In the past 12 MONTHS, how many people have you had penetrative sex with?	None ○ 1 ○ 2 ○ 3 ○	4 ○ 5 ○ 6 ○ More than 6 ○	Not applicable, I have not had penetrative sex in the past 12 months ○	Not applicable, I have not had penetrative sex before ○
4.10 In the past 12 MONTHS, have you been forced to have penetrative sex against your will through threat or violence?	Yes ○	No ○	Not applicable, I have not had penetrative sex in the past 12 months ○	Not applicable, I have not had penetrative sex before ○
4.11 In the past 12 MONTHS, have you been forced to have penetrative sex against your will through threat or violence BY A PERSON WHO STUDIES OR WORKS AT THIS INSTITUTION?	Yes ○	No ○	Not applicable, I have not had penetrative sex in the past 12 months ○	Not applicable, I have not had penetrative sex before ○
4.12 In the past MONTH, how many people have you had penetrative sex with?	None ○ 1 ○ 2 ○ 3 ○	4 ○ 5 ○ 6 ○ More than 6 ○	Not applicable, I have not had penetrative sex in the past month ○	Not applicable, I have not had penetrative sex before ○

PLEASE CHECK THAT YOU HAVE ANSWERED ALL QUESTIONS BEFORE MOVING ONTO THE HEXT PAGE

4.13 In the past MONTH, have you had penetrative sex while you were drunk?	Yes ○	No ○	Not applicable, I have not had penetrative sex in the past month ○	Not applicable, I have not had penetrative sex before ○

4.14 In the PAST WEEK, on how many days have you had penetrative sex?	1 ○ 2 ○ 3 ○ 4 ○	5 ○ 6 ○ 7 ○	Not applicable, I have not had penetrative sex in the past week ○	Not applicable, I have not had penetrative sex before ○

4.15 In the past THREE MONTHS, have you had a sore on your penis or vagina?	Yes ○ No ○

4.16 In the past THREE MONTHS, have you had an unusual discharge from your penis or vagina?	Yes ○ No ○

4.17 How much do you agree or disagree with the following statements? (Answer all questions a-d)	Not Applicable	Agree Strongly	Agree	Unsure	Disagree	Disagree Strongly
a) I believe that my most recent sexual partners have also had other sexual partners in the past month	○	○	○	○	○	○
b) I often expect money or gifts in exchange for sex	○	○	○	○	○	○
c) Many of my friends have more than one current sexual partner	○	○	○	○	○	○
d) I am often tricked or pressurized into having sex when I don't want it	○	○	○	○	○	○

4.18 Males only: Have you been circumcised, and if yes, what age were you?	No ○ Yes, at age 10 years or younger ○ Yes, at age 11-19 ○ Yes, at age 20 or older ○

5.1 Have you ever had an HIV test?	Yes ○ No ○

5.2 Did your most recent HIV test result indicate that you were HIV postitive?	Yes ○ No ○

5.3 Are you taking antiretroviral medication?	Yes ○ No ○ Not applicable ○

5.4 For how long have you been taking antiretroviral medication?	Less than 6 MONTHS ○ 6 - 12 MONTHS ○ More than 12 MONTHS ○ Not applicable ○

PLEASE CHECK THAT YOU HAVE ANSWERED ALL QUESTIONS BEFORE MOVING ONTO THE NEXT PAGE

5.5	When was your most recent HIV test?	In the past 12 MONTHS	1 ○
		More than 12 MONTHS ago	2 ○
		Not applicable	3 ○

5.6	Have you ever been tested for HIV at this institution?	Yes	1 ○
		No	2 ○
		Not applicable	3 ○

6.1	How frequently do you drink alcohol? (beer, wine, spirits, wine cooler, anything with alcohol in it)	Never drink	1 ○
		Occasionally, once in a while	2 ○
		Less than once a week	3 ○
		Once a week	4 ○
		More than once a week	5 ○
		Daily	6 ○

6.2	How often do you go to a bar, tavern, shebeen or nightclub where alcohol is served?	Never	1 ○
		Occasionally, once in a while	2 ○
		Less than once a week	3 ○
		Once a week	4 ○
		More than once a week	5 ○
		Daily	6 ○

6.3	Have you been drunk in the past MONTH?	Yes	1 ○
		No	○
		Not applicable	3 ○

6.4	Do you agree or disagree with the following statements? (Answer all questions a-d)	1 Not Applicable	2 Agree Strongly	3 Agree	4 Unsure	5 Disagree	6 Disagree Strongly
a)	It is acceptable for students to drink alcohol on weekends	○	○	○	○	○	○
b)	Students should not drink alcohol at all	○	○	○	○	○	○
c)	It is acceptable for students to use marijuana / dagga	○	○	○	○	○	○
d)	It is acceptable for students to use drugs like cocaine	○	○	○	○	○	○

6.5	In the past MONTH, have you used any of the following? (Answer all questions a-i)	1 Yes	2 No
a)	Marijuana / dagga	○	○
b)	Mandrax / white pipe	○	○
c)	Ecstasy	○	○
d)	Cocaine powder	○	○
e)	Cocaine rocks / crack cocaine	○	○
f)	Tik / methamphetamine	○	○
g)	Cat / Methcathinone	○	○
h)	LSD / Acid / Hallucinogenic drugs	○	○
i)	Heroin	○	○

6.6	In the past TWELVE MONTHS, have you injected any drug - for example, heroin?	Yes	1 ○
		No	2 ○

PLEASE CHECK THAT YOU HAVE ANSWERED ALL QUESTIONS BEFORE MOVING ONTO THE NEXT PAGE

7.1 How often do you... (Answer all questions a-f)	Never	Less than once a week	Once a week	2-6 days a week	Every day of the week
a) Listen to the radio	○	○	○	○	○
b) Watch television	○	○	○	○	○
c) Read a magazine	○	○	○	○	○
d) Read a newspaper	○	○	○	○	○
e) Use the internet	○	○	○	○	○
f) Use e-mail	○	○	○	○	○

7.2 In the PAST 12 MONTHS have any of the following made you take the problem of HIV / AIDS more seriously? (Answer all questions a-l)	Yes	Somewhat	No
a) Campus radio programmes	○	○	○
b) Campus newspaper articles	○	○	○
c) Leaflets or booklets or posters at this institutio	○	○	○
d) HIV / AIDS activities at this institution	○	○	○
e) Knowing or talking to someone with HIV	○	○	○
f) Knowing someone who has died of AIDS	○	○	○
g) AIDS statistics	○	○	○
h) Talking to a health worker / nurse / doctor	○	○	○
i) Having an HIV test	○	○	○
j) Talking to friends	○	○	○
k) Talking to family members	○	○	○
l) Information on the internet	○	○	○

7.3 In the past year have you contacted an HIV / AIDS helpline for information?	
	Yes ○
	No ○

THANK YOU FOR PARTICIPATING IN THIS SURVEY

APPENDIX 2

The Research Ethics Committee, Faculty Health Sciences, University of Pretoria complies with ICH-GCP guidelines and has US Federal wide Assurance.
- FWA 00002567, Approved dd 22 May 2002 and Expires 20 Oct 2016.
- IRB 0000 2235 IORG0001762 Approved dd 22/04/2014 and Expires 22/04/2017.

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Health Sciences Research Ethics Committee

30/04/2015

Approval Certificate
New Application

Ethics Reference No.: 92/2015

Title: Factors associated with life satisfaction among HIV-positive students in higher education institutions in South Africa

Dear Dr Thokoe Makola

The **New Application** as supported by documents specified in your cover letter dated 23/02/2015 for your research received on the 23/02/2015, was approved by the Faculty of Health Sciences Research Ethics Committee on its quorate meeting of 29/04/2015.

Please note the following about your ethics approval:
- Ethics Approval is valid for 1 year
- Please remember to use your protocol number (**92/2015**) on any documents or correspondence with the Research Ethics Committee regarding your research.
- Please note that the Research Ethics Committee may ask further questions, seek additional information, require further modification, or monitor the conduct of your research.

Ethics approval is subject to the following:
- The ethics approval is conditional on the receipt of 6 monthly written Progress Reports, and
- The ethics approval is conditional on the research being conducted as stipulated by the details of all documents submitted to the Committee. In the event that a further need arises to change who the investigators are, the methods or any other aspect, such changes must be submitted as an Amendment for approval by the Committee.

We wish you the best with your research.

Yours sincerely

*** Kindly collect your original signed approval certificate from our offices, Faculty of Health Sciences, Research Ethics Committee, H W Snyman South Building, Room 2.33 / 2.34.*

Dr R Sommers; MBChB; MMed (Int); MPharMed.
Deputy Chairperson of the Faculty of Health Sciences Research Ethics Committee, University of Pretoria

The Faculty of Health Sciences Research Ethics Committee complies with the SA National Act 61 of 2003 as it pertains to health research and the United States Code of Federal Regulations Title 45 and 46. This committee abides by the ethical norms and principles for research, established by the Declaration of Helsinki, the South African Medical Research Council Guidelines as well as the Guidelines for Ethical Research: Principles Structures and Processes 2004 (Department of Health).

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